Germline cognitive and moral enhancements: An exploration of their potential impact on distributive justice and a case for their incorporation into the Rawlsian political conception

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ABSTRACT

The possibility of genetically intervening in the genome of future people has sparked fears about the potentially negative impact of such interventions on social justice. The risks of unequal access to these novel technologies, coupled with the dangers of the re-emergence of eugenic policies, have been thought to be too great to ignore. Should these fears become reality, we will be in danger of creating new social inequalities or of exacerbating those already prevalent in modern society.

The aim of this thesis is to provide a comprehensive analysis of the impact on distributive justice of germline cognitive and moral enhancements, and to explore how these technologies can become part of the Rawlsian account of justice.

From a biological perspective, we do not choose who we are. It is widely accepted that our genetic make-up is at least partly responsible for the kinds of people that we are and that it can have a marked influence on who we become and on our share of social primary goods. Because of this "genetic lottery", inequalities in access to opportunities invariably exist. Recent scientific advances, however, may provide us with valuable enhancements, particularly to our cognitive and moral capacities, that could be used as tools to re-dress these inequalities. Indeed they might even help to promote the goals sought by the Rawlsian theory of justice.

This thesis shows how the justice arguments usually presented against enhancement technologies can be addressed from within a society governed by the Rawlsian principles of justice. Furthermore, the enhancement of cognitive genetic traits, in particular those involved in the development of fluid intelligence, could broaden the range of opportunities open to citizens and increase the social product available for distribution under the dictums of the difference principle. The moral permissibility of germline enhancements designed to augment the capacities for empathy and a sense of fairness is supported by the contribution they make towards securing the stability of the Rawlsian society.

If these technologies present no moral issues apart from distributional concerns, a society that is governed by the Rawlsian principles of justice would therefore benefit from allowing cognitive and moral enhancements of the human germline.

To David,

for all his love and support

and

to my Mum and Dad,

who made me the person that I am today

(without enhancements)

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And finally, a very special thanks to John Rawls, the most important political philosopher of modern times for providing the inspiration to develop this thesis. Throughout this process my admiration for his body of work has only increased and I hope that, at least in a small way, I have succeeded in honouring his legacy.

"The natural distribution is neither just nor unjust; nor is it unjust that persons are born into society at some particular position. These are simply natural facts. What is just and unjust is the way that institutions deal with these facts."

– John Rawls, A Theory of Justice

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Chapter 1. Introduction

"The natural distribution is neither just nor unjust; nor is it unjust that persons are born into society at some particular position. These are simply natural facts. What is just and unjust is the way that institutions deal with these facts."

– **John Rawls**, **A Theory of Justice**

1.1 The importance of the project

We are now witnessing the very real effects that internal and external aids can have on our cognition and on the emotions influencing our moral responses. New scientific advances provide us with the tantalising prospect of being able to maintain our attention at a much higher level and for longer, process information more effectively and to achieve higher rates of productivity. Likewise, the potential for altering our moral and emotional dispositions is re-opening the debate about what it means to be moral and to what extent we might be able to control the moral dispositions of individuals in order to address complex and challenging issues that might threaten our survival.

Faced with the prospect of altering humanity in perhaps very radical ways, thinkers are beginning to speculate about the potential societal gains associated with new enhancement technologies. In the field of healthcare, for example, Whitehouse et al.[1] describe the benefits from having a cognitively enhanced workforce. In their paper, they describe a fictional scenario where surgeons regularly take attention enhancing drugs, resulting in a higher number of successful surgical procedures leading ultimately to a decrease in human suffering overall. Conversely, Persson et al.[2] speculate about a world where scientific advances increase the potential for small numbers of people to cause very big harms and argue that there could be a duty for

[1] Whitehouse, P. J., Juengst, E., Mehlman, M., and Murray, T. H. (1997). "Enhancing cognition in the intellectually intact." *Hastings Center Report*, 27(3), 14-22.

[2] Persson, I., and Savulescu, J. (2008). "The perils of cognitive enhancement and the urgent imperative to enhance the moral character of humanity." *Journal of Applied Philosophy*, 25(3), 162-177.

the biological enhancement of individuals to help avoid the dire consequences of progress. These arguments are anchored in the idea that such a move will reduce suffering and increase wellbeing overall. The need to embrace new enhancement technologies seems to paradoxically emanate from the need to counteract the negative effects that new advances in technology might bring.

Prima facie, it might seem that both cognitive and moral enhancements could be justified in the name of bigger societal gains. A more tolerant, fairer and empathetic world populated with more intelligent and efficient individuals might feel like something to be desired. If these capacities were modified permanently through germline interventions, the cognitive and moral capacities of individuals would be modified permanently, perhaps forever eliminating any societal ills. Closer scrutiny, however, may reveal powerful ethical objections that can make us reconsider whether it is wise to embrace these interventions.

Before these germline genetic technologies make their way into our day to day lives, it is our responsibility to identify and explore the myriad of ethical issues that they entail. Of special importance are the socio-economic inequalities that the introduction of these technologies might generate. Leaving the discussion of these issues until these technologies are fully available and only subject to market restrictions will be too late. This is the drive and main focus of my dissertation. In order to evaluate whether cognitive and moral enhancements of the human germline should be permitted, I carefully assess the effect that these technologies might have on distributive justice. I do this by using the Rawlsian theory of distributive justice, which is committed to the protection of basic liberties, equality, and improving the socio-economic situation of the least advantaged.

Why Rawls? It is hard to explain why Rawls seemed to me the obvious starting point to evaluate the permissibility of germline genetic interventions. The simplest answer would be my admiration for his body of work. His ability to reconcile concerns of liberty and equality has always struck me as the most daunting of endeavours. These often conflicting values have led political theorists to strongly support one view over another. His body of work has been dedicated to resolving the conflicting claims between liberty and equality. His principles of justice provide an elegant solution.

A cursory investigation of the potential issues associated with germline technologies highlighted how they had the potential to threaten the liberty and equality that Rawls was concerned to protect. The challenge that I face is to carefully scrutinise the concerns arising from these technologies and establish whether the Rawlsian framework is equipped to answer and accommodate these concerns. The use of Rawls's framework provides me with a systematic procedural system for thinking about potential justice issues brought by emerging genetic technologies Furthermore, since these advances had not been available at the time when Rawls developed his theory, I ask the question whether these new goods could themselves become part of the Rawlsian theory.

Even though attempts have been made to incorporate new enhancement technologies in the Rawlsian framework there is an important difference between my work and that of others in the literature. Focusing on cognitive enhancements, the extension of the Rawlsian conception has generally involved dropping the normal functioning assumption that permeated the development of his ideal theory.[3] As such, new genetic technologies have been added to the Rawlsian conception insofar as they restored normal functioning and reinstated the status of individuals as fully functioning citizens. Norman Daniels presented an argument of this kind by incorporating a full account of healthcare based on the protection of fair equality of opportunity.[4] Similarly, Colin Farrelly has argued that the distribution of a set of valuable natural talents could be distributed through a version of the difference principle which he called the Lax Biological Difference Principle.[5] My adherence to the normal functioning ideal means that I am able to extend Rawls's theory whilst remaining faithful to Rawls's original assumptions at all times.

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[3] Rawls uses ideal theory to set the scope of his theory in identifying the principles of justice. He makes two assumptions in the development of his theory. One, he assumes strict compliance and two, he assumes reasonable favourable conditions, that is, there exists adequate economic means, education and the skills needed to run a democratic regime. Rawls, J. (1971). *A theory of justice*: Belknap Press. Pages 8, 245 & Rawls, J. (2005). *Political liberalism*: Columbia University Press. Pages 13, 47 and 246.

[4] Daniels, N. (1998). "Negative and positive genetic interventions: is there a moral boundary?" *Science in context*, 11(3-4), 439-53, Daniels, N. (2008). *Just health: meeting health needs fairly*: Cambridge University Press, Daniels, N. (2010). "Rights to health care and distributive justice: programmatic worries." *Health Rights*.

[5] Farrelly, C. (2016). *Biologically Modified Justice*: Cambridge University Press.

This piece of work has been developed as an attempt to incorporate potential genetic technologies aimed at the modification of cognitive and moral capacities into a Rawlsian ideal political theory. As Thomas Pogge asserts correctly when he talks about this potential flaw in the Rawlsian body of works:

> *"Perhaps we will never reach a scheme whose worst social position is optimal. But we do not need the assurance that such a scheme is reachable in order to recognize that we ought to support institutional reform that improves the worst social position, just as one does not need the assurance that one can reach perfection for undertaking to become a better human being."*[6]

Despite concerns about the relevance of ideal theory, I, like Rawls, believe that this is the right place to start if we ever want to engage the public into a fruitful debate that might result in shaping public policy.

1.2 The scope and assumptions of the philosophical enquiry

The prospect of genetically enhancing the cognitive and moral capacities of human beings has given rise to a vast amount of discussion regarding their feasibility and ethical permissibility. Examining all the salient aspects relating to these technologies will take a lot more space than this thesis permits. The following points will help to clarify the scope of the thesis:

- Nature of genetic interventions: The cognitive and moral enhancements chosen for the ethical and justice evaluation are all considered genetic enhancements of a **germline** nature. The terms genetic enhancements and germline enhancement are used interchangeably from Chapter 3 onwards. They are considered enhancements since their goal is to modify non-pathological human traits making them "better than well". The concept of "enhancement" is contrasted to that of "therapy" as only the latter intends to treat or prevent disease. An intervention is said to be done at the germline level when it is carried out either within the reproductive cells (sperm and eggs) or in very early stage embryos. Once altered, the modified germline deoxyribonucleic acid (DNA) is passed from parent to child, permanently affecting the child's genetic make-up, and transferred to future

[6] Pogge, T. W. M. (1989). *Realizing rawls*: Cornell University Press. Page 12

generations. Germline interventions are often distinguished from **somatic** cell interventions. Somatic cells are fully differentiated or adult cells. Intervening at the somatic level involves the modification or insertion of new genes into the adult cells of the human body. Although the long term effects of somatic cell modifications are far from established, it is generally assumed that these changes will only affect the individuals receiving the intervention and that future generations will not be affected by them.

These different concepts give rise to four different types of intervention: germline enhancements, somatic enhancements, germline therapy and somatic therapy

The ethical and practical implication these terms convey are very different. A cursory survey of the literature indicates that the ethical challenges arising from permanently intervening in the genome of future persons with the only purpose of improving their already normally functioning traits can be very complex. Such challenges may be, for example, far more complex than evaluating the ethical permissibility of modifying the genome of an adult carrying a mutation of the CFTR gene responsible for the onset of cystic fibrosis. For the purpose of this research I focus on the type of interventions that seem to raise more ethical and practical challenges: germline enhancements.

- Chosen cognitive and moral traits: The cognitive and emotional/moral capacities assessed in this thesis were chosen after existing literature indicated that they had a biological component and were liable to be altered by genetic means.

In terms of the capacities affecting cognition, I narrowed down my choice to those capacities that had, prima facie, the potential to be valuable for carrying out most life plans. For this I drew inspiration from the Cattell-Horn theory of fluid intelligence[7] also known as "on the spot reasoning" and novel problem solving. The choice of moral capacities was however guided by different criteria. The desirability of certain

[7] This theory argued that the primary abilities involving intelligence are divided into fluid and crystallised dimensions. The fluid dimension they believed is the outcome of biological factors such as heredity or damage to neuro-sensory structures. Horn, J. L., and Cattell, R. B. (1966). "Refinement and test of the theory of fluid and crystallized general intelligences." *Journal of educational psychology*, 57(5), 253.

moral traits can be particularly dependent on social, historical and cultural settings. The difficulties in asserting that, for example, it would be in the best interest of individuals to be more tolerant, more altruistic, and more empathetic made it difficult to find traits that might truly have a universal appeal. Inspired by the Rawlsian conception, and in particular by the problem of stability of the well-ordered society, I wondered whether there could be any moral capacities that could contribute towards securing this stability. Following Rawls's writings on moral psychology and the importance he assigns to political virtues, I hypothesised that moral dispositions such as empathy and a sense of fairness could positively contribute to Rawlsian stability.

- Safety and precision: Throughout, I have worked on the assumption that the genetic technologies I am evaluating would have been proven to be safe and would be able to precisely target the desired cognitive or moral traits. Should these technologies not be demonstrated to be safe, they must not be permitted and therefore no further ethical evaluation would be required. Safety is presumed to be a necessary, albeit not a sufficient condition for their permissibility.
- Ethical evaluation: The chapter dedicated to the broad ethical issues of germline technologies provides a brief introduction to the most salient issues found in the literature. A detailed exploration of all the ethical issues associated with these technologies falls outside the scope of this work, which has as its focus issues of distributive justice. My aim in this thesis is to highlight the main ethical arguments that are found in the literature without providing a detailed critique of their strength or validity. The more modest objective in this section is that of making the reader aware of the ethical implications that may need to be considered even if all the distributive justice concerns are fully addressed.
- Analysis of the Rawlsian political conception: A thorough critique of the Rawlsian political conception is beyond the scope of this work. For the purpose of my research I am neither critically assessing the structure nor the content of the Rawlsian theory of justice. The evaluation of the Rawlsian framework, whenever it takes place, is only performed in order to, first, address the social justice objections present in the literature and, second, to assess how these technologies can become part of the theory and help Rawls deliver the objectives set by his political

conception. My aim throughout has been to keep faithful to the Rawlsian theory of justice and its spirit.

1.3 Aims and structure

My aim in this thesis is to provide a positive argument in support of the introduction of genetic interventions that have the potential to enhance the cognitive and moral capacities of individuals. A case in support of the permissibility of these technologies will be made from the viewpoint of justice using the Rawlsian political theory as the framework for my arguments.

In order to set the appropriate background to the main justice argument, Chapter 2 provides an overview of cognitive and moral enhancements. This serves two main purposes. First, it provides a snapshot of their use and current scientific developments. Second, it offers the context against which to identify the main ethical arguments against their implementation. This review serves as an introduction to the more daring possibility of potentially modifying the genome to improve the cognitive and moral capacities of human beings. In order to discuss the possibility of genetic enhancements, I outline existing research and evidence, where available, of genome interventions that might result in human genetic modification. In particular, I focus on germline interventions designed to permanently alter the capacities of future generations.

The main ethical concerns regarding the implementation of germline genetic interventions are then discussed in Chapter 3. This overview helps to illuminate the kinds of concerns that need to be addressed if society embraces the use of these technologies.

The Rawlsian theory of justice is introduced in Chapter 4. His concern about the effects that inequalities in the distribution of natural talents have on people's life prospects motivates me to use his theory as a framework for the development of my arguments. I contend that this concern should also apply to the differences in the natural capacities involved in inductive and deductive reasoning, information processing and problem solving skills. Furthermore, I argue that germline enhancements should be incorporated into his political theory as primary goods.

My focus resides in the Rawlsian theory of justice and I argue that this conception of political justice provides a positive argument for the permissibility of these interventions. I do this by exploring how Rawls's political theory can and should be extended to include genetic cognitive enhancements as social primary goods in their role as all-purpose goods, valuable across most conceptions of the good.

Having secured a place for cognitive genetic enhancements within the Rawlsian theory of justice, the focus then turns to evaluating the potential issues of distributive justice that these new technologies might bring. Concerns related to the potentially restricted access to genetic cognitive enhancements are evaluated in Chapter 5. Each of these concerns is then addressed from a Rawlsian perspective and it is shown that they do not pose a threat to a well-ordered society governed by Rawlsian principles of justice. Moreover, if supported by an extended fair equality of opportunity principle designed to remove any legal barriers of access to these technologies, they have the potential to strengthen the drive towards equality and reciprocity.

The possibility of genetically modifying the moral dispositions of empathy and a sense of fairness and how these might affect the Rawlsian account of stability is explored in Chapter 6. In his later writings Rawls was anxious to ensure that the well-ordered society ruled by fair principles of justice was stable and enduring over time. I suggest that Rawls didn't successfully resolve the problem of stability and that the possibility of altering the moral disposition of citizens might provide him with an additional tool to solve it. The natural capacities for empathy and a sense of fairness are incorporated into the Rawlsian account of moral psychology. Having been shown to play a constitutive part in the development of a sense of justice, I explore whether they might be able to contribute towards securing the stability of the Rawlsian society. I conclude that, regardless of their potential to strengthen stability, the protection of fundamental basic liberties should prevent the compulsory genetic enhancement of the capacities of empathy and sense of fairness. Nonetheless, there are strong reasons to grant their permissibility.

Chapter 2. Cognitive and moral enhancements - An overview of current use and scientific evidence

This chapter provides the reader with an outline of the most commonly used cognitive and moral enhancements and an evaluation of the current situation and future developments. An exhaustive analysis of the existing technologies is beyond the scope of this thesis. The aim is to provide an overview of current trends in cognitive and moral enhancements alongside evidence, wherever available, of resulting increased capacities in healthy subjects.

The first part of the chapter focuses on cognition and how a range of capacities linked with its acquisition and development can be affected by different means. The use of pharmacology highlights how medication originally developed for the treatment of disease has spilled over towards increasing the capacities of healthy subjects. This trend is also seen in the areas of brain stimulation and neurotechnology. The more invasive nature of these procedures, however, means that its application to the non-disease arena is not as widespread. The section on cognition finishes with an overview of those "everyday" enhancers that seem to largely escape ethical scrutiny due to their assimilation into our everyday lives.

The second part is dedicated to a brief review of the enhancement of moral capacities. As with cognition, attempts to increase moral capacities have taken place in the fields of pharmacology, brain stimulation and neurotechnologies. Perhaps surprisingly, nutrition also seems to play a role in the development and suppression of antisocial behaviours.

The review of these current technologies is used as background to explore the possibility of investigating the genetic augmentation of cognition and morality. Recent technological advances will show that the promise of genetic modification of these capacities may become a reality in the not too distant future.

2.1 – The enhancement of cognition – A brief overview

The term 'cognition' is used to describe a range of mental processes commonly associated with the acquisition of knowledge.[8] The analysis that follows focuses on the narrow concept of cognition which excludes aspects pertaining to emotional intelligence such as mood and other emotional states. Instead, the discussion centres on the impact of these technologies on aspects relating to understanding, memory, attention, reasoning skills and executive functions such as decision-making, planning and problem solving skills. The use of cognitive enhancements has been reported across the millennia with people taking psychoactive substances in order to achieve altered states of consciousness. Psychotropic plant substances containing mescaline or LSD, for example, were consumed by American Indian tribes to facilitate communication with other worlds in visual-seeking ceremonies. Evidence of use of these substances can also be traced back to prehistoric times with remains being found in sites associated with burial and religious ceremonies.[9]

Nowadays, although the reasons behind the yearning to transcend our normal capacities may have changed, our desire to explore the limits of our cognition remains, it seems, resolute. Advocates of cognitive enhancements argue that in challenging times such as these, they might equip us with improved decision-making capacities that might become essential to face the challenges posed by our environment, such as climate change, new epidemics, such as avian flu, and dwindling natural resources. Some thinkers also argue that the benefits may well expand to the moral realm, maintaining that they may even positively contribute to moral reasoning.[10]

Even though the genetic modification of our cognitive abilities may be a long way from being a reality, non genetic enhancers, such as memory enhancing drugs like

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[8] BMA. (2007). *Boosting your brainpower: Ethical aspects of cognitive enhancements*. BMA.

[9] Guerra-Doce, E. (2015). "Psychoactive Substances in Prehistoric Times: Examining the Archaeological Evidence." *Time and Mind*, 8(1), 91-112.

[10] Harris, J., and Chan, S. (2010). "Moral behavior is not what it seems." *Proceedings of the National Academy of Sciences*, 107(50), E183. Discussing the possibility of moral enhancement, John Harris warns about the dangers of chemically altering emotions linked to our moral behavior. The development of smart drugs, he claims , is permissible as long as they positively contribute to moral reasoning, the enhancement of cognition therefore would be a better way to improve ourselves morally.

Ritalin, external aids, like computers and information storage devices, or even access to top class educational institutions are already being regularly used in our society. Some of these external enhancers, such as the regular intake of caffeine or the use of personal computers for work or leisure are, to a certain extent, uncontroversially integrated into our society. Others, such as the use of smart drugs designed to augment our attention and alertness levels or the more invasive brain stimulation techniques are slowly making a transition away from therapy and towards enhancement.

I provide a concise summary of current cognitive enhancers exploring the use of smart drugs, brain stimulation, brain machine interfaces, as well as the more commonly used everyday external enhancers, such as caffeine, nicotine, nutrition and education. This is accompanied by examples of current evidence on the impact that current and potential enhancements can have in our lives.

2.1.1 Psychopharmacology

Advances in psychopharmacology have provided us with the so-called 'smart drugs', which have the power to alter our cognitive capacities. These smart drugs are also known as nootropics[11] and they can function as cognitive and intelligence enhancers designed to augment mental functions such as memory, concentration, alertness and information processing.[12] The attractiveness of these drugs has led them to have already found their place in a society where people are keen to increase their productivity and competitive edge.[13]

Increasing brain performance by chemical means and other invasive techniques is often referred to as neuro-enhancement or cosmetic neurology. At present pharmacology is the most used method of attempting neuro-enhancement although there is a limited number of studies showing data on improvements in cognition in healthy subjects. This is due to strict regulations for drug development and clinical trials restricting any testing to the pursuit of therapeutic goals alone. However, it is

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[11] The term "nootropic" is derived from the Greek roots for mind (noos) and for "toward" (tropein)

[12] Cakic, V. (2009). "Smart drugs for cognitive enhancement: ethical and pragmatic considerations in the era of cosmetic neurology." *Journal of Medical Ethics*, 35(10), 611-615. Page 1.

[13] Talbot, M. (2009). "Brain gain." *The New Yorker*, 32-43.

through research in existing conditions such as Alzheimer's, Lewi-Body dementia or attention deficit disorders that unintended non-therapeutic effects have been reported. This section provides an insight into the research carried out on the most popular "smart drugs" and how their use is spilling out into the non-disease arena.

Pharmacology has focussed mainly on the development of executive and memory functions. Although executive function is a complex term to define, it is here understood as the high-level cognitive processes that enable people to solve problems, plan and execute tasks, process and retain information, and have the flexibility to adjust to changing demands. Attempting to boost these capacities with the use of smart drugs is becoming more common as their positive results in therapy are leading to them being tried out in healthy individuals.

What follows is a sample of the main medications making a transition from therapy to enhancement.

- Ritalin, Adderall and Dexedrine:

The main common feature of these drugs is that they were all originally developed for the treatment of attention deficit hyperactivity disorder (ADHD) and are known to work on those patients suffering from deficits in attention, concentration, spatial working memory and planning. **Ritalin** or Concerta (methylphenidate) is perhaps the most widely known smart drug. Classified as an amphetamine, it works by increasing the level of dopamine in the brain. Dopamine is a neurotransmitter known to have an effect on a variety of brain pathways such as motivation, addiction, attention, or motion control. Specifically, it has been used in children diagnosed with behavioural problems for the last 40 years and proven to be effective in treating attention disorders.[14] It is commonly prescribed to children suffering from ADHD with the number of prescriptions in the UK doubling in the last decade from 359,100 in 2004 to 992,200 in 2014.[15]

[14] Mills, C. (1998). "One pill makes you smarter: an ethical appraisal of the rise of Ritalin." *Report from the Institute for Philosophy & Public Policy*, 18(4), 13-7. (page 13)

[15] Bullard, I. (2015). *Prescriptions Dispensed in the Community, England 2004-14*. Health and Social Care Information Centre. Page 139-142

The reported improvements from the use of Ritalin have not been restricted to those individuals diagnosed with a cognitive impairment. Improvements in planning and task execution have also been reported in healthy volunteers after taking Ritalin compared to when they were given a placebo. Ritalin is also linked to positive changes in working memory in those patients suffering from cognitive disorders but when given to healthy volunteers there are still improvements in working memory.[16]

The intake of Ritalin, however, has not always resulted in improvements in performance. Positive results seem to be heavily dependent on the individual's starting baseline level. As the following studies show, the enhancing effects of Ritalin seem to depend on the initial functioning level of the cognitive capacity. While assessing the effects of Ritalin in healthy individuals, Elliot et al.[17] reported increased accuracy in spatial working memory tasks with higher results in those individuals who presented with initially lower levels of performance. In contrast, they also reported some decreases in performance in those with a naturally higher working memory capacity. Mehta et al.[18] found similar improvements in spatial working memory performance, again particularly in those individuals with a lower baseline capacity.

These results have been further replicated and reported in the systematic review carried out by Repantis et al.[19] . Although this review describes how Ritalin cannot be said to have an overall neuro-enhancing effect on healthy individuals, those taking the drug displayed increased levels of accuracy in spatial working memory tasks:

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[16] Elliott, R., Sahakian, B. J., Matthews, K., Bannerjea, A., Rimmer, J., and Robbins, T. W. (1997). "Effects of methylphenidate on spatial working memory and planning in healthy young adults." *Psychopharmacology*, 131(2), 196-206.

[17] Ibid.

[18] Mehta, M. A., Owen, A. M., Sahakian, B. J., Mavaddat, N., Pickard, J. D., and Robbins, T. W. (2000). "Methylphenidate enhances working memory by modulating discrete frontal and parietal lobe regions in the human brain." *J Neurosci*, 20(6), RC65.

[19] Repantis, D., Schlattmann, P., Laisney, O., and Heuser, I. (2010). "Modafinil and methylphenidate for neuroenhancement in healthy individuals: A systematic review." *Pharmacol Res*, 62(3), 187-206.

"The analyses of the existing studies provide no consistent evidence for neuro-enhancement effects of MPH, though evidence for a positive effect on memory of healthy individuals was found."[20]

These improvements in spatial working memory were higher for those individuals presenting lower initial levels of performance. It is noteworthy that, once again, there was also a general decrease in performance in those individuals with a naturally higher working memory capacity. The effects of Ritalin seem to work best with those starting out at a lower end of the performance spectrum.

Adderall is the market name for mixed amphetamine salts consisting primarily of dextroamphetamine. Like Ritalin, this prescription stimulant was also originally developed for the treatment of ADHD. The effect that both Adderall and Ritalin have on patients suffering from ADHD consists of an increase in attention levels as well as a reduction in hyperactivity and impulsivity.[21]

In a similar way to Ritalin, Adderall appears to have made a transition towards the non-therapeutic arena. Even though the evidence in this field is limited, randomised control trials (RCTs)[22] have shown that taking Adderall increases vigilance and attention in healthy subjects although they do not seem to improve in other cognitive domains.

However, research led by Irena Ilieva[23] has yielded different results. Using a double blind randomised trial, they studied the effects of Adderall on 13 different cognitive capacities (including episodic memory, working memory, inhibitory control, convergent creativity, intelligence and scholastic achievement). Even though the results did not show any significant improvement, there seemed to be a shift in the way the participants perceived their actual performance when they knew that they had taken the drug instead of the placebo. This raises an interesting issue about the

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[20] Ibid. page 204

[21] Sahakian, B., and Morein-Zamir, S. (2007). "Professor's little helper." *Nature*(450), 1157-1159.

[22] Franke, A. G., Bagusat, C., Rust, S., Engel, A., and Lieb, K. (2014). "Substances used and prevalence rates of pharmacological cognitive enhancement among healthy subjects." *European Archives of Psychiatry and Clinical Neuroscience*, 264(1), 83-90.

[23] Ilieva, I., Boland, J., and Farah, M. J. (2013). "Objective and subjective cognitive enhancing effects of mixed amphetamine salts in healthy people." *Neuropharmacology*, 64, 496-505.

motivation for taking this particular drug and its rising popularity amongst students. The perception that you are doing better than you actually are may be enough of a driving force for taking these smart drugs and may perhaps explain their increase in use, particularly amongst university students. It is reported that full time university students in the US are twice as likely to have used Adderall as young people aged between 18-24 not in full time education.[24]

Dexedrine was the original medication for the treatment of ADHD and it is also prescribed for the treatment of narcolepsy. Although similar to Adderall, its composition is slightly different. Adderall is a combination of amphetamine salts, 75% of which is dextroamphetamine. Dexedrine is 100% dextroamphetamine and more powerful than both Adderall and Ritalin when taken in equal doses. The enhancing effects on normal individuals have been studied with reported increases in motor function, improved performance in cognitive tests and better reaction times after taking the drug[25]

Its use has now expanded to the military, particularly amongst military pilots, as an effective means of counteracting fatigue in order to maintain focus and attention for longer. Studies have been designed to assess its efficacy in flight simulator situations where the participants have been subjected to extended periods of wakefulness. A report by John Caldwell et al. analysed the existing studies on sleep deprived pilots and showed that, Dexedrine was effective "for maintaining flight skills, psychological mood, and physiological activation (measured via electroencephalograph data)." [26]

- Modafinil

Modafinil (or Provigil) is a wakefulness promoting drug originally designed to treat the fatigue symptoms of those suffering from narcolepsy, excessive daytime

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[24] (2008). *Nonmedical Use of Adderall among Full-Time College Students*. US Department of Health and Human Services, Office of Applied Studies.

[25] Rapoport, J. L., Buchsbaum, M. S., Zahn, T. P., Weingartner, H., Ludlow, C., and Mikkelsen, E. J. (1978). "Dextroamphetamine: cognitive and behavioral effects in normal prepubertal boys." *Science*, 199(4328), 560-563.

[26] Caldwell, J. A., Caldwell, J. L., and Darlington, K. K. (2003). "Utility of dextroamphetamine for attenuating the impact of sleep deprivation in pilots." *Aviation, space, and environmental medicine*, 74(11), 1125-1134.

sleepiness or, simply, having jobs that require long work shifts. Similarly to Ritalin, Adderall, and Dexedrine, Modafinil is now being used by healthy patients for non-therapeutic purposes, in particular to promote alertness and wakefulness.

Although reports on the effects of enhancers such as Modafinil are scarce, due largely to their 'off label'[27] use, there are already studies that provide us with some early results. For example, a study led by Elliot et al. [28] described how, during their clinical trial, a control group of healthy adults taking Modafinil showed relative improvements in tasks involving spatial working memory and planning compared to a placebo group.

Perhaps unsurprisingly, since one of the original uses of this drug was for the treatment of sleep disorders such as narcolepsy, researchers have also found a link between Modafinil and performance in sleep deprived individuals.[29] When given to sleep deprived doctors the drug seems to reduce their impulsiveness in taking decisions and they showed a greater degree of cognitive flexibility in problem solving. These are the results found by Sugden et al[30] in a double blind randomised trial involving 39 healthy male resident doctors. Their cognitive performance was measured after 19 participants were given a placebo and 20 participants took a 200mg Modafinil tablet. Those participants taking Modafinil scored higher in the working memory and planning tests and were less impulsive taking decisions. Barbara Sahakian, who took part in the above study, claims that around 90% of the worldwide use of Modafinil can be classed as "off-label" use by healthy individuals.

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[27] A medicine or drug is said to be used "off label" when they're used outside the terms of their licence. This may include, usage for an unapproved indication, age group, dosage or route of administration.

[28] Elliott, R., Sahakian, B. J., Matthews, K., Bannerjea, A., Rimmer, J., and Robbins, T. W. (1997). "Effects of methylphenidate on spatial working memory and planning in healthy young adults." *Psychopharmacology*, 131(2), 196-206.

[29] Repantis, D., Schlattmann, P., Laisney, O., and Heuser, I. (2010). "Modafinil and methylphenidate for neuroenhancement in healthy individuals: A systematic review." *Pharmacol Res*, 62(3), 187-206. page 204

[30] Sugden, C., Housden, C. R., Aggarwal, R., Sahakian, B. J., and Darzi, A. (2012). "Effect of pharmacological enhancement on the cognitive and clinical psychomotor performance of sleep-deprived doctors: a randomized controlled trial." *Ann Surg*, 255(2), 222-7.

- Piracetam and donepezil.

Piracetam (Nootropil) & **donepezil** (Aricept). These drugs act as acetylcholine esterase inhibitors and were originally developed for the treatment of Alzheimer's disease. Acetylcholine is the neurotransmitter charged with facilitating memory formation. Increased levels of Acetylcholine in the brain are linked with improvements in cognition in patients with Alzheimer's disease. Drugs such as Piracetam stops the enzyme from breaking down, increasing the intensity and duration of action of the neurotransmitter and therefore maintaining or increasing cognitive performance in individuals.

Once again we are seeing how research aimed at the treatment of memory deficiencies is now giving way to reported enhancing effects on cognition. In the case of donepezil one study of pilots in flight simulator activities showed that it enhances the capacity to retain complex training tasks.[31] Another study reported improved visual and verbal and episodic memory in 30 healthy volunteers.[32]

The summary above provides a non-exhaustive list of the smart drugs most frequently found in the literature. Both the proven and perceived benefits resulting from the use of these nootropics have captured the imagination of ordinary people and thinkers alike. Their "off label" use makes it very difficult to truly know how widespread their use for enhancement purposes has become. In an attempt to answer this, Nature prepared a survey back in 2008 and asked 1,400 participants from 60 different countries whether they had ever used Modafinil, Ritalin or Beta Blockers for cognition enhancing purposes.[33] The survey reported that 202 people responded with one in five saying they had used drugs for non-medical reasons to stimulate their focus, concentration or memory, with Ritalin being the most extensively used drug closely followed by Modafinil.

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[31] Yesavage, J. A., Mumenthaler, M. S., Taylor, J. L., Friedman, L., O,ÄôHara, R., Sheikh, J., Tinklenberg, J., and Whitehouse, P. J. (2002). "Donepezil and flight simulator performance: effects on retention of complex skills." *Neurology*, 59(1), 123-125.

[32] Grön, G., Kirstein, M., Thielscher, A., Riepe, M. W., and Spitzer, M. (2005). "Cholinergic enhancement of episodic memory in healthy young adults." *Psychopharmacology*, 182(1), 170-179.

[33] Maher, B. (2008). "Poll results: look who's doping

"*Nature*. City, pp. 674-675.

Similar non-therapeutic use was reported on a survey conducted by Babcock et al at the Massachusetts College of Liberal Arts. The results showed that "more than 16% of the respondents reported trying methylphenidate (Ritalin) recreationally, and 12.7% reported taking the drug intranasally."[34] A later survey in 2001[35] conducted among 10,904 US college students in 119 different colleges investigated their use of Ritalin, Dexedrine and Adderall for non-medical purposes. The responses showed an average 6.9% use with participants attending colleges requiring highly competitive admission requirements reporting the highest use.

However this level of off label use does not seem to correlate with the efficacy of the drugs themselves, at least this is what the 2010 systematic review carried out by Repantis et al seems to show.[36] For example, this systematic review states that the studies included in the review showed very mixed results in healthy individuals.

There seems to be similar reports on the effects of the use of pharmacology for enhancing purposes. The size of the effect seems to be correlated with the performance baseline levels of the individuals. Generally, those already experiencing cognitive deficits or starting from a low but normal threshold seem to benefit most from taking the drug. These may indicate that there is a limit to how much cognition may be improved. Furthermore, should these drugs fully make their transition to the enhancement arena, the concentration of benefits for segments of the population that are initially less advantaged may be an important factor in their societal acceptability.

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[34] Babcock Q Fau - Byrne, T., and Byrne, T. (2000). "Student perceptions of methylphenidate abuse at a public liberal arts college." *Journal of American college health*, 49(3), 143-5.

[35] McCabe, S. E., Knight, J. R., Teter, C. J., and Wechsler, H. (2005). "Non-medical use of prescription stimulants among US college students: prevalence and correlates from a national survey." *Addiction*, 100(1), 96-106.

[36] Repantis, D., Schlattmann, P., Laisney, O., and Heuser, I. (2010). "Modafinil and methylphenidate for neuroenhancement in healthy individuals: A systematic review." *Pharmacol Res*, 62(3), 187-206.

2.1.2 Brain Stimulation & neurotechnology

Transcranial brain stimulation (TBS) is a non-invasive way of affecting brain activity by using electromagnetic induction. There are three types of TBS: transcranial magnetic stimulation (TMS); transcranial direct current stimulation (TDCS) and transcranial alternating current stimulation (TACS). These different types of TBS are all non-invasive and they differ from each other in the type of current used (DC or AC) and the mode of delivery (using coils or electrodes).[37]

Similar to other types of electrical stimulation of the brain (see DBS later on in this chapter), TMS was originally developed to aid the research and treatment of conditions related to the motor system. These techniques later widened their scope and have been successfully used in the treatment of drug resistant depression and other mental and neurological disorders. New research has opened up the possibility of diverting this technology towards the modification of mood and changes to behaviour and cognitive capacities.

In terms of cognitive processes, TBS is able to modify learning by influencing the modulation of neuroplasticity in the brain. A study team led by Snowball,[38] targeted the dorsolateral prefrontal cortex (DLPC) combining transcranial random noise stimulation (TRNS) with advanced cognitive training in healthy individuals for a period of 5 days, and assessed the effect this would have on the speed of arithmetic calculation and memory recall arithmetic training. The results of the study showed how TRNS coupled with cognitive training enhanced arithmetic performance and these effects appear to be lasting. When the participants were recalled six months after the study, those changes in performance when presented with further mental arithmetic tests were maintained.

Deep brain stimulation is a recognized and established treatment for the symptoms caused by conditions such as Parkinsons disease, tremor and other movement

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[37] The Nuffield Council of Bioethics. (2013). *Novel neurotechnologies: intervening in the brain*. London.

[38] Snowball, A., Tachtsidis, I., Popescu, T., Thompson, J., Delazer, M., Zamarian, L., Zhu, T., and Cohen†Kadosh, R. (2013). "Long-Term Enhancement of Brain Function and Cognition Using Cognitive Training and Brain Stimulation." *Current biology : CB*, 23(11), 987-992.

disorders.[39] This treatment involves the implantation of 1.27cm electrodes in the brain. The electrodes themselves are connected to battery-driven stimulus generators placed under the patient's skin and electric signals are then sent to certain areas of the brain altering the brain cells and neural networks to treat the aforementioned conditions.

The effects of DBS on certain cognitive capacities have manifested themselves during the treatment of unrelated conditions such as obesity. A particular study designed to treat morbid obesity with DBS resulted in some unforeseen effects on memory.[40] In this case, a 50 year old patient reported heightened autobiographical memory recall whilst being stimulated with DBS impulses.[41]

Research into the application of DBS for the treatment of psychological disorders such as obsessive compulsive disorder (OCD), is now in place yielding some initial results on how certain personality traits can be affected. An example of how DBS can have a marked effect on mood is described by Schermer.[42] The case of the 'happy' OCD patient describes how after having received DBS for the treatment of OCD, the patient's symptoms remain the same except for an unexplained feeling of happiness. The intention to treat a disease on this occasion has instead unexpectedly resulted in an alteration of the patient's mood.

The aggressive behaviour often found in patients suffering with chronic cluster headaches has also shown signs of decline in patients treated with DBS.[43] In this case, two patients suffering from mental retardation and with severe aggressive and

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[39] Schermer, M. (2011). "Health, Happiness and Human Enhancement, Dealing with Unexpected Effects of Deep Brain Stimulation." *Neuroethics*.

[40] Hamani, C., McAndrews, M. P., Cohn, M., Oh, M., Zumsteg, D., Shapiro, C. M., Wennberg, R. A., and Lozano, A. M. (2008). "Memory enhancement induced by hypothalamic/fornix deep brain stimulation." *Ann Neurol*, 63(1), 119-23.

[41] Ibid. "Unexpectedly, the patient reported sudden sensations that he described as "deja vu" with stimulation of the first contact tested (contact 4: 3.0 volts, 60-microsecond pulse width [pw], and 130Hz). He reported the sudden perception of being in a park with friends, a familiar scene to him. He felt he was younger, around 20 years old. He recognized his epoch-appropriate girlfriend among the people"

[42] Schermer, M. (2011). "Health, Happiness and Human Enhancement, Dealing with Unexpected Effects of Deep Brain Stimulation." *Neuroethics*.

[43] Franzini, A., Marras, C., Ferroli, P., Bugiani, O., and Broggi, G. (2005). "Stimulation of the posterior hypothalamus for medically intractable impulsive and violent behavior." *Stereotact Funct Neurosurg*, 83(2-3), 63-6.

disruptive behavioural patterns and not suitable for pharmacological treatment were instead implanted with electrodes and provided with neurostimulation. The aggressive behaviour of one patient had completely disappeared whilst the other appeared a lot calmer and capable to re-instate familial and social relations.

In the cases just described it seems that the application of DBS for the treatment of specific conditions has provided us with unexpected results which could be applied towards the modification of certain emotional and cognitive traits.

New advances in neurotechnology have opened up the opportunity of connecting the brain to external devices. Brain Computer Interfaces (BCIs), also known as Brain Machine Interfaces (BMIs) translate brain activity into command signals for external devices.[44] It involves the translation of brain signal into commands to operate external devices, such as mechanical artificial prosthesis, robotic limbs or computer sensors. The external devices will respond according to increasing or decreasing specific neural activity.

There are currently three main forms of BCI. Electroencephalography (EEG) is the least invasive technique often coming in the shape of headwear or helmets recording electric signals via the scalp. Other techniques such as invasive direct connections and electro-corticography (ECoG) use electrodes which are placed on the surface of the brain.

The current research into BCIs is focused mainly on potential ways to assist patients affected by paralysis and how to improve the use of prosthesis or any other mechanical aids. Specifically, the aim is to provide them with a novel way to communicate, detect any changes in consciousness and help them control mobility devices such as prostheses and wheelchairs.

There seems however to have been a move from these typically therapeutic uses to research into the augmentation of cognitive capacities. Particularly, the US has

[44] Heersmink, R. (2009). *Ghost in the Machine: A Philosophical Analysis of the Relationship Between Brain-Computer Interface Applications and their Users*.

reportedly been using BCIs in the military with the aim of increasing the soldiers' perceptual and attention capabilities and also to control weapons remotely.[45]

Their role as potential cognitive enhancers has already been discussed in the literature, in particular the creation of neural implants capable of downloading our acquired knowledge into synthetic devices or even connecting our brains to the internet. Should this be possible, humans would have access to huge amounts of information at their fingertips. Futurist writers, such as Ray Kurzweil argue that we will reach a point when our "biological brains" will merge with our "synthetic brains" giving rise to a super enhanced type of human intelligence.[46] Brain to brain communication has also been predicted by Alan Rudolph, former Director for Chemical and Biological Technologies at the US Defence Advanced Research Projects Agency (DARPA), who claimed:

> *"In the long run, we could have brain-brain communication, we could improve the performance of normal healthy individuals"*[47]

In the field of warfare, DARPA is hoping to reach a point were electrodes inserted in the brains of pilots can be used as memory implants where complex manoeuvres can be stored allowing pilots to perform them without having actually received any training.

Neural stem cells are used for their potential to regenerate damaged brain cells lost as a result of disease or injury. Since the brain has not got the capacity to regenerate cells naturally, this type of therapy can be vital for patients suffering from chronic degenerative diseases such as Alzheimer's and Parkinson's or those who have suffered acute tissue loss caused by a stroke.[48]

There is a growing body of evidence that indicates that stem cell transplantation can lead to improved cognition in the ageing or diseased brain. The insertion of neural

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[45] Kotchetkov, I. S., Hwang, B. Y., Appelboom, G., Kellner, C. P., and Connolly, E. S., Jr. (2010). "Brain-computer interfaces: military, neurosurgical, and ethical perspective." *Neurosurgical focus*, 28(5), E25.

[46] Kurzweil, R. (1999). *The coming merging of mind and machine*: Scientific American, Incorporated.

[47] Hoag, H. (2003). "Neuroengineering: Remote control." *Nature*, 423(6942), 796-798.

[48] The Nuffield Council of Bioethics. (2013). *Novel neurotechnologies: intervening in the brain*. London. Pages 20-40

stem cells into the brain of research rats have resulted in improvements in spatial learning and memory[49]. Furthermore, recent research in animal models shows that these improvements in cognition are also transferable to the healthy brain.

The improved performance in normal functioning individuals using these diverse brain altering technologies may seem to fall within the realm of science fiction, nonetheless, if realised, it will dramatically change the way we use our brain to interact with external devices around us. These technologies, however, are still in their infancy and their potential to enhance our cognitive capacities needs to be further examined.

2.1.3 Nutrition and environmental enrichment.

The role of nutrition, essential in fighting off disease and improving the physical well being of the individual, is widely acknowledged. Nowadays there is a growing recognition that adequate nutrition also provides fuel for the brain and it is essential for its optimal development.

Dietary supplements are widely used in the hope that they will lead to an improvement in cognitive capacities. The low risk of the side effects associated with these supplements make them fairly uncontroversial and well accepted even though evidence of their effectiveness is currently not sufficient to truly consider them as effective enhancers. Another reason for their popularity seems to be that these types of enhancements are viewed as 'natural' by the public and therefore elicit a more immediate acceptance. This positive response elicited by 'naturalness' was recorded during the public engagement activities devised for the 2008 report by the Academy of Medical Sciences.[50]

Amongst these supplements the market readily offers, fatty acids such as Omega 3, vitamins E, B6, B12, Brahmi and Gingko Bilboa among others. Tentative early results have linked the use of Omega 3 and Omega 6 fatty acids to improvements in reading ability, IQ levels and a deceleration in the cognitive decline of patients with

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[49] Qu, T., Brannen, C., Kim, H., and Sugaya, K. (2001). "Human neural stem cells improve cognitive function of aged brain." *Neuroreport*, 12(6), 1127-1132.

[50] The Academy of Medical Sciences. (2008). *Brain Science, Addiction and Drugs*.

Alzheimer's. A review conducted by Gomez Pinilla[51] shows how taking Omega 3 fatty acids has been consistently linked to optimum brain function. In particular, a type of Omega 3 acid named DHA is linked to the enhancement of cognitive abilities in rodents.

Environmental enrichment is understood as the provision of more stimulating social and physical surroundings. The effect of enriched environments using animal models have also reported improvements in cognitive function. Studies such as one conducted by Leggio et.al[52] consistently show that enriched sensorimotor environments lead to improvements in spatial and non-spatial memory tasks in rats.

Although experimental studies purporting to demonstrate the effect of environmental enrichment in humans is rare, there is also evidence that autistic children experience improvements in cognition and symptom severity. This was the result of a randomised control trial in 2013 comparing two groups of autistic children. The group exposed to an enriched environment consisting of exposure to classical music, aromatherapy, and objects with different shapes, colours and textures, carefully chosen to stimulate the children's senses showed mean improved scores after six months.[53]

Perhaps another way of thinking about the value of enrichment is to look at the effect on brain development that impoverished stimulation causes in the cognitive and social development of infants. A study[54] carried out in Romania describes the cognitive and social status of children selected at random from an orphanage compared to non-orphanage children from the same location. The study concluded that the orphanage children exhibited deficits in both cognitive and social functioning.

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[51] Gomez-Pinilla, F. (2008). "Brain foods: the effects of nutrients on brain function." *Nature Reviews Neuroscience*, 9(7), 568-578.

[52] Leggio, M. G., Mandolesi, L., Federico, F., Spirito, F., Ricci, B., Gelfo, F., and Petrosini, L. (2005). "Environmental enrichment promotes improved spatial abilities and enhanced dendritic growth in the rat." *Behavioural brain research*, 163(1), 78-90.

[53] Woo, C. C., and Leon, M. (2013). "Environmental enrichment as an effective treatment for autism: a randomized controlled trial." *Behavioral neuroscience*, 127(4), 487.

[54] Kaler, S. R., and Freeman, B. (1994). "Analysis of environmental deprivation: Cognitive and social development in Romanian orphans." *Journal of Child Psychology and Psychiatry*, 35(4), 769-781.

The provision of good quality education can be said to be the traditional enhancement par excellence. It has been shown to improve memory scores and it has a protective effect on cognitive decline several decades after schooling has finished [55]. These improvements can often arise via different pathways with education having an impact on health behaviour, type of occupation and social interactions all of which are themselves outcomes that can affect cognitive performance. Another study[56] examined the effects of an educational reform act in 1947 increasing compulsory education by one year. In a longitudinal study comprising 12,000 individuals, the participants were assessed at age 70 and it reports higher scores in executive function and memory tasks for those born after the measure was implemented.

2.1.4 The usual suspects: nicotine and caffeine.

Caffeine is part of the daily routine of many people. It is naturally found in everyday foods and beverages such as tea coffee and chocolate, and has gradually become the stimulant par excellence. Unlike most of the enhancing substances and technologies described in this chapter, caffeine is widely considered to be safe when taken in moderation and it has been endorsed culturally. Caffeine has been proved to augment vigilance and attentiveness as reported in studies such as the one carried out by Wesensten et.al[57] in 2005. This randomized controlled trial compared the effects of caffeine, modafinil and dextroamphetamine on performance and alertness. The results showed that the enhancing effects of caffeine are comparable to those of modafinil and dextroamphetamines.

Smokers have long reported the cognitive 'kick' they experience after having a cigarette. This is associated with a sharp increase in attention, learning and memory. That cognitive kick is in sharp contrast with the health issues associated with smoking, however pharmaceutical companies are now researching ways to develop

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[55] Schneeweis, N., Skirbekk, V., and Winter-Ebmer, R. (2014). "Does Education Improve Cognitive Performance Four Decades After School Completion?" *Demography*, 51(2), 619-643.

[56] Banks, J., and Mazzonna, F. (2012). "The effect of education on old age cognitive abilities: evidence from a regression discontinuity design." *The Economic Journal*, 122(560), 418-448.

[57] Wesensten, N. J., Killgore, W. D., and Balkin, T. J. (2005). "Performance and alertness effects of caffeine, dextroamphetamine, and modafinil during sleep deprivation." *J Sleep Res*, 14(3), 255-66.

a 'smart drug' which will target the nicotine receptors in the brain and therefore generate the same cognitive effects reported whilst smoking but bypassing the negative health implications. This push to develop a "healthy" formulation of nicotine has been prompted by evidence suggesting that its consumption increases cognitive performance in patients with neuropsychiatric disorders [58]and disease related cognitive decline[59]. Reports on cognitive impairment induced by nicotine withdrawal have led to studies reporting a reversal of that impairment once nicotine levels were restored[60]. Furthermore, there is also evidence that certain aspects of attention and memory can improve in healthy subjects although results are too small in magnitude to be significant[61]

2.2 The enhancement of morality - A brief overview

The previous section explained how we could augment certain components of our cognition in ways previously unattainable. Thinkers have seen in moral enhancement the answer to deal with existing and upcoming threats such as war, climate change and terrorism, largely caused by developments in technologies that have given human beings the necessary tools to cause harm at a large scale. The possibility of altering our moral emotions such as sympathy, empathy, a sense of fairness and our capacity for moral imagination, provides us with the tantalising prospect of altering moral dispositions and behaviours so that these societal problems are lessened or at least contained. My intention is not to portray the enhancement of moral capacities by biological means as an alternative to more traditional methods of moral instruction such as education. I see both methods as compatible and complementary to one another.

It has been argued that such interventions need to be accompanied by superior moral qualities to enable us to ascertain the best way to employ our enhanced

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[58] Lanni C, L. S., Pascale A, Del Vecchio I, Racchi M, Pistoia F, Govoni S. (2008). "Cognition enhancers between treating and doping the mind." *Pharmacol Res.* , 196-213. Page 199

[59] Levin, E., McClernon, F. J., and Rezvani, A. (2006). "Nicotinic effects on cognitive function: behavioral characterization, pharmacological specification, and anatomic localization." *Psychopharmacology*, 184(3-4), 523-539.

[60] Heishman, S. J., Taylor, R. C., and Henningfield, J. E. (1994). "Nicotine and smoking: a review of effects on human performance." *Experimental and Clinical Psychopharmacology*, 2(4), 345.

[61] Heishman, S. J. (1998). "What aspects of human performance are truly enhanced by nicotine?".

cognitive powers. As in the case of malevolent genius, superior ability can threaten the interests of others when our moral compass fails to show us where best to direct our skills and abilities. Unlike in the case of cognition however, it might not be so simple to identify which parts of ourselves make us moral. One cannot generally break down morality in the same way as fluid intelligence, making its analysis more complicated. Many of these moral dispositions may be dependent on the cultural and social context and their value often varies within and across ethical doctrines.[62] As I will examine later, moral behaviour may also be dependent on cognitive capacities that aid moral reasoning helping us distinguish between right and wrong, and adding another layer of difficulty to what enhancing morality really means. These points seem to indicate that unpicking the components of moral behaviour would require a much larger investigation than this piece of work allows. To simplify the task ahead, the analysing will aim to include those moral dispositions that could be considered as contributing to moral behaviours in some if not all contexts without trying to establish whether the "right" kind of moral behaviour can be achieved.

2.2.1 Psychopharmacology

Research on the use of pharmacology has shown that cognitive capacities are amenable to manipulation. This section examines whether this claim can also be applied to certain emotional dispositions known to affect our moral behaviour. What follows is a brief outline of some of the evidence that might support the case for the potential biological modification of moral traits.

2.2.1.1 The happiness neurotransmitter - serotonin

Serotonin is one of the neurotransmitters thought to have an impact on the moral behaviour of individuals. Substances designed to slow down the re-absorption of serotonin are commonly prescribed for the treatment of depression and anxiety disorders. These drugs are commonly known as SSRIs (Selective Serotonin Re-

[62] For instance utilitarianism, deontology and virtue oriented theories have a very different understanding of what it means to behave morally giving priority to consequences, duties and virtues respectively. Furthermore, even within the utilitarian theory there will be disagreement as to what it counts as achieving the best outcome and how this should be measured.

uptake Inhibitors) and amongst them we can find citalopram, sertraline or fluoxetine (most commonly known as Prozac). The level of serotonin in the brain is regulated in humans by the MAO-A gene short for monoamine oxidase A and also known as the 'warrior gene'. Having the 'wrong' version of this gene leads to a deficient re-uptake of serotonin. Deficits in the level of serotonin are linked to aggressive and violent behaviours.

Experiments such as the one carried out by Crockett et al.[63] provide some hopeful results showing that different levels of serotonin seem to have an impact on the range of pro-social behaviours we exhibit. This study explains how those participants treated with the drug citalopram (which stimulates serotonin re-uptake in the brain) tended to display quite different decision making behaviours when faced with two moral dilemmas: the "trolley problem" and the "ultimatum game".[64] Findings showed that the intake of citalopram promoted the participants' pro-social behaviour by increasing their reluctance or aversion to hurt others whilst at the same time making them more unlikely to accept unfair offers which would put others at a disadvantage.

There is also evidence that some drugs designed to inhibit serotonin re-uptake influence moral behaviour, specifically our tendencies towards aggressive behaviour. Inhibiting serotonin re-uptake means that the levels of serotonin in the brain are boosted by avoiding their re-uptake into the presynaptic cell. This is just

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[63] Crockett, M. J., Clark, L., Hauser, M. D., and Robbins, T. W. (2010). "Serotonin selectively influences moral judgment and behavior through effects on harm aversion." *Proceedings of the National Academy of Sciences of the United States of America*, 107(40), 17433-17438.

[64] The moral scenarios presented by Crockett are as follows: In the trolley problem the experimenter is trying to evaluate people's aversion to cause harm. You are asked to imagine yourself as the driver of a runaway trolley going at top speed and rapidly approaching a fork in the track. Your brakes have failed and if you follow your set path you will run over 5 innocent people and most probably kill them, However if you do change direction by simply turning a switch and steering right you will go into a separate path with just one man on the track carrying out some maintenance work who if hit by you will also die. Your options are therefore to either carry on and kill 5 people or change track and kill one man.

The ultimatum game is designed to assess people's acceptance of unfair offers The game consists of a 'proposer' and a 'responder'. The proposer makes a number of monetary offers to different responder. If the responser accepts the offer they both walk away with the money, if they reject it they both get nothing

For a more detailed discussion of the results see: ibid.

the way Prozac works, according to Kramer, these changes in serotonin will have an effect on our social behaviour:

> *"if you can alter serotonin and norepinephrine you should be able by mere virtue of the change in the biological internal milieu, to produce a more comfortable individual"*[65].

Prozac is known to lower aggression leading to people being more relaxed, agreeable and easy going in their interaction with others.[66] This could have an influence on our social behaviour leading to an increase in cooperation between unrelated groups with conflicting interests and resulting in an improved rate of conflict resolution and therefore a reduction in violent confrontations. Research carried out by Wood et.al[67] support the link between co-operation and levels of serotonin. In this piece of research, those individuals whose levels of serotonin had been reduced displayed a less co-operative attitude when playing the Prisoners Dilemma when compared to those with an increased level of serotonin.

2.2.1.2 The addictive neurotransmitter - Dopamine

The discussion of cognitive enhancements showed how drugs such as Adderall and Ritalin were thought to affect the dopamine systems of the brain ultimately affecting the attention levels of patients suffering from ADHD. Dopamine also has a different function linked to our emotional responses to external stimuli. Dopamine has become known as the motivation or addictive neurotransmitter because of the way it fuels our cravings and how it controls the anticipation of pleasure that different activities or objectives may bring. The greater the anticipation of the possibility of getting a reward the higher the levels of dopamine found in the brain. The different alleles found in individuals can lead to more or less risky behaviour and are strongly linked to desire and reward feelings triggering strong rushes of pleasure. Individuals with a specific version of the dopamine regulator gene D4

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[65] Ibid. page 175.

[66] Kramer, P. D. (1997). *Listening to Prozac*: Penguin Books - Revised edition (September 1, 1997).

[67] Wood, R. M., Rilling, J. K., Sanfey, A. G., Bhagwagar, Z., and Rogers, R. D. (2006). "Effects of tryptophan depletion on the performance of an iterated Prisoner's Dilemma game in healthy adults." *Neuropsychopharmacology*, 31(5), 1075-84.

seem to present a more quick tempered behaviour also characterised by impulsivity, embracing novelty seeking activities.[68] In fact the effects of dopamine on our brains are often likened to those of cocaine.

Research attempting to assess the link between dopamine and pro-social behaviour used Torcamole as the chosen drug to increase the level of dopamine in the brain.[69] The combination of drug or placebo with a number of economic games showed that the group with increased dopamine levels displayed a general increased sensitivity to inequality and a more modest increase in egalitarian behaviour when compared to the placebo group.

2.2.1.3 The love hormones - vasopressin and oxytocin

Science is steadily providing us with examples that show that our moral behaviour towards each other may have a biological basis. I have already described above how levels of serotonin in the brain can have an effect on our aversion to harm, rejecting unfair offers and our levels of aggression towards others. Next I will focus on experiments carried out affecting the levels of oxytocin and vasopressin in both animals and humans.

These two hormones are usually linked to social behaviours, particularly to the feelings of attachment that draw us to one another. Oxytocin is released by both men and women during orgasm and in women during childbirth. Oxytocin can also be increased by sexual intercourse, touch, massage and other more common means such as the contraception pill or corticoids used to treat asthma. Vasopressin is released in both men and women after sex and is said to have an impact in the consolidation of long-term relationships

Experiments carried out on animals have shown that genetic manipulations can lead to improvements in memory in rats and can even change the sexual behaviour of the

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[68] Ebstein, R. P., Novick, O., Umansky, R., Priel, B., Osher, Y., Blaine, D., Bennett, E. R., Nemanov, L., Katz, M., and Belmaker, R. H. (1996). "Dopamine D4 receptor (D4DR) exon III polymorphism associated with the human personality trait of novelty seeking." *Nature genetics*, 12(1), 78-80.

[69] Sáez, I., Zhu, L., Set, E., Kayser, A., and Hsu, M. "Dopamine Modulates Egalitarian Behavior in Humans." *Current Biology*, 25(7), 912-919.

meadow vole from polygamous to monogamous.[70] The case of the prairie vole may pave the way towards discovering how we form attachments towards other people. Prairie voles' mating behaviour is distinctly different from their closely related cousins the Montane voles. Whilst Prairie voles are monogamous and raise jointly their young for weeks, the Montane male vole is notoriously polygamous and takes no part in the raising of its young. This difference was thought to have a biological basis with the male Prairie voles having a much larger number of vasopressin receptors when compared to their polygamous counterparts. This study illustrates how it is possible to change the mating behaviour of Prairie voles from polygamous to monogamous by altering the levels of vasopressin in male voles. Altering the pair bonding formation in animals it seems, can now be achieved in a laboratory.[71] Experiments on rats have also shown how depleting the levels of oxytocin in female rats leads them to reject their young. Conversely, when oxytocin is injected in rats that have never had sex, it leads them to display nurturing behaviours even towards young from other female rats.

Scientists have also studied the effect that different levels of oxytocin has on human behaviour. Oxytocin is well known for its role in the formation of mother-infant bonding with maternal levels of oxytocin increasing during breastfeeding and suckling. This example of bond formation leaves us with the tantalizing possibility of influencing the formation of social bonds in humans.

Nonetheless, caution should be had when attempting to manipulate oxytocin levels in humans. Oxytocin seems to increase trust within groups but it does seem to make you care less about people outside your group.

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[70] Lim, M. M., Z. Wang, D.E. Olaz ´ , and Aba;, X. R., E.F. Terwilliger, and L.J. Young. (2004). "Enhanced partner preference in a promiscuous species by manipulating

the expression of a single gene." *Nature*(429), 754–757.

[71] Lim, M. M., Wang, Z., Olazabal, D. E., Ren, X., Terwilliger, E. F., and Young, L. J. Ibid."Enhanced partner preference in a promiscuous species by manipulating the expression of a single gene." 429(6993), 754-757.

2.2.1.4 Noradrenaline and the fight or flight response

The level of noradrenaline in the brain is linked with the "fight or flight" response in both humans and animals. Noradrenaline levels have also been shown to influence both emotional memory and emotional responses

These levels of noradrenaline activity can be manipulated using psychotropic drugs. One of these drugs, the beta-blocker Propranolol, has been used to treat a variety of conditions ranging from hypertension, stress and acute anxiety[72] to, more recently, the treatment of posttraumatic stress disorder to prevent the consolidation of emotional memories arising from a traumatic situation.[73]

A study of the use of propranolol has shown that by regulating the levels of noradrenaline in the brain we can control implicit (but not explicit) forms of racial prejudice.[74] Implicit bias is thought to have a stronger emotional component than explicit forms of bias and can therefore be more susceptible to modification once the biomedical pathways linked to this behaviour are identified.[75] Another trial[76] has shown that having taken propranolol, participants tended to assess sacrificial actions, that is harming others directly, as morally unacceptable and reduced utilitarian considerations in ethical judgments.

2.2.2 Brain Stimulation and neurotechnology

Non-invasive brain stimulation has been traditionally used for the treatment of cognitive and motor related impairments, however the direct effect that these technologies have on emotional responses and moral behaviours has not received the same level of interest.

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[72] Tyrer, P. J., and Lader, M. H. (1974). "Response to Propranolol and Diazepam in Somatic and Psychic Anxiety." *British Medical Journal*, 2(5909), 14-16.

[73] Stein, M. B., Kerridge, C., Dimsdale, J. E., and Hoyt, D. B. (2007). "Pharmacotherapy to prevent PTSD: Results from a randomized controlled proof-of-concept trial in physically injured patients." *Journal of Traumatic Stress*, 20(6), 923-932.

[74] Terbeck, S., Kahane, G., McTavish, S., Savulescu, J., Cowen, P. J., and Hewstone, M. (2012). "Propranolol reduces implicit negative racial bias." *Psychopharmacology*, 222(3), 419-424.

[75] Stanley, D., Phelps, E., and Banaji, M. (2008). "The neural basis of implicit attitudes." *Current Directions in Psychological Science*, 17(2), 164-170.

[76] Levy, N. (2013). "Emotion in moral decision-making: Beta-adrenergic blockade reduces utilitarian judgment." *Biological Psychology*, 92, 323-328.

Despite a lack of evidence that these interventions result in morally desirable behaviours, there have been results that show how they might actually impede acting morally. For example, the anterior prefrontal cortex of the brain is known to have a role in deception. In other words, this part of the brain seems to be particularly active when a person is lying, in particular when those lies had been intentionally prepared and fabricated rather than spontaneous lying. This could potentially provide us with important information about moral decision making, at least in explaining what happens to our brains when we engage in deceitful behaviours. Ahmed Karim and his team[77] decided to explore how these behaviours would be affected following the electrical stimulation of this part of the brain. They found that using transcranial magnetic stimulation made people better liars. Another related study led by Inga Karton[78]shows how people's willingness to tell the truth or lie spontaneously can also be influenced by electrical stimulation of the brain, in this case the dorsolateral prefrontal cortex (DLPC). This study used sixteen volunteers who were asked to name the colour of the different discs presented to them on a computer screen. Those participants receiving stimulation during the experiment to the left DLPC of the brain had a tendency to lie about the colour of the disk, whereas those stimulated on the right side of the DLPC had that tendency slightly reduced.

Reciprocal fairness behaviours seem to be negatively affected by TMS when this is applied to the right dorsolateral prefrontal cortex (rDLPC). Participants in a study conducted by Knoch et al.[79] showed a reduced willingness to reject unfair offers when playing the ultimatum game. The authors also suggest that this might mean that participants are less able to resist economic incentives, even when the monetary offer is intentionally unfair.

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[77] Karim, A. A., Schneider, M., Lotze, M., Veit, R., Sauseng, P., Braun, C., and Birbaumer, N. (2010). "The Truth about Lying: Inhibition of the Anterior Prefrontal Cortex Improves Deceptive Behavior." *Cerebral Cortex*, 20(1), 205-213.

[78] Karton, I., and Bachmann, T. (2011). "Effect of prefrontal transcranial magnetic stimulation on spontaneous truth-telling." *Behavioural brain research*, 225(1), 209-14.

[79] Knoch, D., Pascual-Leone, A., Meyer, K., Treyer, V., and Fehr, E. (2006). "Diminishing Reciprocal Fairness by Disrupting the Right Prefrontal Cortex." *Science*, 314(5800), 829-832.

The evidence to date, seems to indicate that brain stimulation results in displays of selfish rather than moral conduct. However, the pathways leading to these self-regarding behaviours may one day illuminate the path to more pro-social attitudes

2.2.3 Nutrition

The research of nutrition and inadequate moral development has been based on the hypothesis that lack of essential nutrients can adversely affect moral behaviours. This has prompted some research on the effect that nutritional supplement could have on the antisocial behaviours of young prisoners. A trial conducted by Gesh et.al[80] investigated whether the intake of supplementary vitamins, essential fatty acids and minerals would lead to a significant reduction in disciplinary incidents. Compared with those participants taking placebos, those receiving the nutritional supplements reported an average of 35.1% reduction in offences compared to the placebo group with an average reduction of 6.7%[81]

Another trial reported how the intake of fatty acids and fish oils result in a lower likelihood of high hostility in young adults.[82] Furthermore, students taking part in a study where they were given daily vitamin supplementation for 4 months reported a 47% lower mean rate of antisocial behaviour compared to those students taking a placebo.[83]

2.3 Cognition, morality and genetics. The possibility of augmenting our cognitive and moral capacities by intervening in the genome.

External and biological interventions have been shown to modify both cognition and emotions in a variety of ways. The prospect of manipulating our genome brings to

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[80] Gesch, C. B., Hammond, S. M., Hampson, S. E., Eves, A., and Crowder, M. J. (2002). "Influence of supplementary vitamins, minerals and essential fatty acids on the antisocial behaviour of young adult prisoners Randomised, placebo-controlled trial." *The British Journal of Psychiatry*, 181(1), 22-28.

[81] Ibid. Page 26

[82] Iribarren, C., Markovitz, J., Jacobs Jr, D., and Schreiner, P. (2004). "Dietary intake of n-3, n-6 fatty acids and fish: relationship with hostility in young adults--the CARDIA study." *European Journal of Clinical Nutrition*, 58(1), 24.

[83] Schoenthaler, S. J., and Bier, I. D. (2000). "The effect of vitamin-mineral supplementation on juvenile delinquincy among American schoolchildren: A randomized, double-blind placebo-controlled trial." *The Journal of alternative and complementary medicine*, 6(1), 7-17.

the surface some practical difficulties whilst, at the same time, opening up a tantalising new prospects to permanently modify the cognitive capacities and moral behaviours of individuals

The belief that our moral and cognitive capabilities have a genetic component is not new. Back in 1794 the Marquis of Condorcet supported the view that moral and cognitive characteristics could indeed be inherited.[84] The aim of this section is to establish the feasibility of these genetic interventions ever occurring.

2.3.1 The influence of genes in the development of cognitive capacities

The analysis so far has established the way in which cognition can be changed using chemical, surgical and external means. The background is now set to extend our analysis and assess the evidence behind genetic manipulation of cognition.

In this section I provide an analysis of the latest technological advances in this area, explore the genetic component of cognition and elucidate whether we will be able to intervene directly in the genome to augment those capacities that have a genetic component.

Adoption and twin behaviour studies have provided some vital clues in the heritability of cognitive capacities. Heritability should be understood as the "statistical measure of the genetic contribution to differences among individuals."[85] The term itself implies that cognitive abilities are not wholly dependent on our genes but they might help towards explaining what makes us who we are. Going back to the twin studies, combined findings have shown that 50% of the differences in IQ have a genetic basis with the remaining 50% variation being due to environmental factors such as education, nutrition, social setting etc. With regards to particular IQ domains, 60% of differences in verbal ability can be explained by the genetic make-up whereas genes explain 50% of the variance in spatial ability. Twin

[84] Condorcet, and Baker, K. M. (2004). "Sketch for a Historical Picture of the Progress of the Human Mind: Tenth Epoch." *Daedalus*, 133(3), 65-82.

[85] Plomin, R., and DeFries, J. C. (1998). "The genetics of cognitive abilities and disabilities." *Scientific American*, 278(5), 62-69. Page 63

studies carried out as early as the 1920s consistently suggest a genetic influence in what has been commonly known as general intelligence (g)[86].

Significantly these genetic factors seem to have a bigger role as we get older whilst environmental influences seem to decline with time:

> *"In summary, twin, adoption, and longitudinal family studies of IQ all converge on the conclusion that genetic factors increase while shared environmental factors decrease in importance with age, at least until middle age."*[87]

This could suggest that, as we get older and are free to choose our environment we tend to favour those settings most suited to our biological make-up. On the other hand, some genes are only activated once we reach adulthood, which might also explain the growing influence of our genes as we age.

This section shows the role that certain genes play in the development of some of our cognitive capacities. However, at no point should we ignore the influence on cognition of other external factors such as nutrition, social relationships and family settings and their interaction with our genes. Furthermore, it still leaves important questions unanswered, such as the contribution of individual genes and the complexity of their interaction between themselves and with their external environment.

Establishing a genetic influence on cognitive capacities is the first step, however more information is needed about the type and numbers of genes involved in this relationship. It is only then that we would be able to contemplate modifying these genetic dispositions. There are, however, difficulties in identifying every single gene associated with a compound capacity, such as intelligence. The task of determining the heritability of cognitive capacities is a lot more straightforward than detailing its exact genetic specification. Rather than researching single gene mutations scientists

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[86] Some caution is advised when talking about 'g' and, more specifically, its measuribility. 'g' was originally proposed as the term to denote 'general cognitive ability' and it is meant to represent between-individual covariance among different tests of cognitive abilities such as verbal and memory abilities abstract reasoning, spatial, abilities to name a few.

Plomin, R. (2003). "Genetics, genes, genomics and g." *Molecular Psychiatry*, 8(1), 1-5.

[87] Bouchard, T. J., and McGue, M. (2003). "Genetic and environmental influences on human psychological differences." *Journal of neurobiology*, 54(1), 4-45.Page 17

are dealing with a combination of genes that are involved in complex dimensions such as the case of intelligence or "g", generally understood as cognition. Individual cognitive traits are affected by multiple genes working together rather than by single genes working in isolation.[88]

Nonetheless, a number of genes have been identified as influencing certain capacities regularly used to measure intelligence. The case of memory formation and consolidation has been widely researched in the hope that a solution can be found to conditions, such as Alzheimer's disease, Parkinson's disease and age related cognitive decline, which are all generally associated with memory deficits. The **NMDA receptor gene** (NR2B) has been identified as an example of how we can influence memory through genetic manipulation in a study led by Tang et al.[89] Their results show that alterations in the NMDA receptors (known to be associated with the formation of memory) can lead to improvements in long term memory in transgenic mice when compared to 'normal' mice. The now famous enhanced "doogie" mice were reported to show higher ability for storing and coding information, greater curiosity and a stronger preference for new situations than normal mice. Although it is too early to determine whether these alterations could be successfully transferred to humans it has paved the way for intervening into the cognitive capacities of mammals.

Moving from animal models to studies in humans, research reports that polymorphisms of the **BDNF gene** are linked with poor performance in memory tests,[90] whilst the **COMT** gene is linked to the activation of memory circuits.[91]

Speech and language disorders are also known to have a genetic component. In particular, the **FOXP2** gene is thought to contain a faulty nucleotide which is the

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[88] Plomin, R., and DeFries, J. C. (1998). "The genetics of cognitive abilities and disabilities." *Scientific American*, 278(5), 62-69. Page 68

[89] Tang, Y.-P., Shimizu, E., Dube, G. R., Rampon, C., Kerchner, G. A., Zhuo, M., Liu, G., and Tsien, J. Z. (1999). "Genetic enhancement of learning and memory in mice." *Nature*, 401(6748), 63-69.

[90] Egan, M. F., Kojima, M., Callicott, J. H., Goldberg, T. E., Kolachana, B. S., Bertolino, A., Zaitsev, E., Gold, B., Goldman, D., and Dean, M. (2003). "The BDNF val66met polymorphism affects activity-dependent secretion of BDNF and human memory and hippocampal function." *Cell*, 112(2), 257-269.

[91] Egan, M. F., Goldberg, T. E., Kolachana, B. S., Callicott, J. H., Mazzanti, C. M., Straub, R. E., Goldman, D., and Weinberger, D. R. (2001). "Effect of COMT Val108/158 Met genotype on frontal lobe function and risk for schizophrenia." *Proceedings of the National Academy of Sciences*, 98(12), 6917-6922.

cause of a particular hereditary disorder in the area of speech and language. This gene, lacking in chimpanzees and other great apes, is thought to be the "first gene relevant to the human ability to develop language."[92] This gene has also been linked to the development of learning and spatial cognition. Genetically modified mice engineered to express the human form of the FOXP2 gene were demonstrably better than non-engineered mice at learning which part of the T-shaped maze to navigate in order to get a food reward.[93] The importance of how these results may translate to research in humans resides in its potential to identify ways to maintain or increase procedural memory, that is the memory required for routine everyday tasks.

Reasoning skills and general IQ are known to be influenced by genes such as APOE, NCSTN, KL, COMT, PRNP and DISC1. Studies have shown that they can affect the life long cognitive ability, particularly relating to reasoning skills, of specific cohorts[94]. Furthermore, children born with 2 copies of the **Thr92Al** gene are affected with low levels of thyroid and have been found to be four times more likely to have a low IQ.[95]

This brief summary does not provide the full picture, it does however provide the reader with the flavour of the current genetic research into cognition. As science constantly develops, the genetic picture will become clearer and it might make the possibility of genetic enhancement a reality.

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[92] Enard, W., Przeworski, M., Fisher, S. E., Lai, C. S. L., Wiebe, V., Kitano, T., Monaco, A. P., and Paabo, S. (2002). "Molecular evolution of FOXP2, a gene involved in speech and language." *Nature*, 418(6900), 869-872. Page 869

[93] Schreiweis, C., Bornschein, U., Burguière, E., Kerimoglu, C., Schreiter, S., Dannemann, M., Goyal, S., Rea, E., French, C. A., Puliyadi, R., Groszer, M., Fisher, S. E., Mundry, R., Winter, C., Hevers, W., Pääbo, S., Enard, W., and Graybiel, A. M. (2014). "Humanized Foxp2 accelerates learning by enhancing transitions from declarative to procedural performance." *Proceedings of the National Academy of Sciences*, 111(39), 14253-14258.

[94] Harris, S., Fox, H., Wright, A., Hayward, C., Starr, J., Whalley, L., and Deary, I. (2006). "The brain-derived neurotrophic factor Val66Met polymorphism is associated with age-related change in reasoning skills." *Molecular psychiatry*, 11(5), 505-513. Page 505

[95] Taylor, P., Okosieme, O., Sayers, A., Pearce, E., Gregory, J., Lazarus, J., Panicker, V., Channon, S., Timpson, N., and Dayan, C. (2014). "Effect of low thyroid hormone bioavailability on childhood cognitive development: data from the Avon Longitudinal Study of Parents and Children birth cohort." *The Lancet*, 383, S100.

2.3.2 Moral capacities with a genetic component: Can we alter our morality by intervening in the genome?

An analysis of the current situation regarding the development of moral enhancements shows how we are already capable of chemically altering neurotransmitters linked to aggressive, trusting and pro-social dispositions. There is evidence in animal models that seems to indicate that pro-social behaviours are hardwired, with "bees that collect pollen for the whole hive, mole rats that build elaborate tunnels used by other group members, and meerkats that risk their lives to guard a common nest"[96]

The biological component of these traits may lead to the more direct genetic manipulation of genes presenting an opportunity to permanently change the behavioural and moral dispositions of future generations, These advances in genetics may lead to what Wasserman and Liao call "geneceuticals".[97] These types of substances would target the genetic basis of emotions therefore potentially affecting people's moral behaviour.

Manipulation of genes in animals has already shown significant behavioural changes Experiments already show how we can even change the sexual behaviour of the prairie vole from polygamous to monogamous.[98]

Genes are responsible for the behaviour of enzymes and neurotransmitters that are thought to have a role on the display of a range of moral behaviours. This section highlights those more prominent in the literature and that will help substantiate the claim that moral dispositions can be modified by genetic means.

Research shows that low levels of the enzyme known as **Monoamine Oxydase A (MAOA)** combined with childhood maltreatment have an effect on aggressive

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[96]Vogel, G. (2004). "The evolution of the golden rule: humans and other primates have a keen sense of fairness and a tendency to cooperate, even when it does them no discernible good." *Science*, 303(5661), 1128-1131. Page 1128

[97] Wasserman, D., and Liao, S. M. (2008). "Issues in the Pharmacological Induction of Emotions." *Journal of Applied Philosophy*, 25(3), 178-192.

[98] Lim, M. M., Z. Wang, D.E. Olaz ´ , and Aba;, X. R., E.F. Terwilliger, and L.J. Young. (2004). "Enhanced partner preference in a promiscuous species by manipulating

the expression of a single gene." *Nature*(429), 754–757.

behaviour displayed in adulthood.[99] The gene regulating the production of this enzyme can result in two distinct genotypes. Those individuals with high enzyme production (HMAG) and exposed to childhood abuse are less likely to display antisocial behaviour than those presenting a low enzyme profile (LMAG) and also exposed to childhood abuse. Those with higher enzyme levels seem to mitigate displays of antisocial behaviour in those cases where the individual has suffered mistreatment in childhood. However, the reverse seems to be true if no childhood mistreatment has occurred at all. Even though there is no evidence that the presence of either genotype solely determines a predisposition to aggressive behaviour it brings to the fore the biological component that might lead to those behaviours when interacting with certain environments.

The natural reuptake of **serotonin** is linked to differences in the serotonin transmitter genes.[100] A study divided participants into three groups depending on the type of serotonin promoter gene they had. Ordinarily, normal levels of serotonin reuptake are associated with the long form of the promoter gene, while a truncated version implies reduced serotonin reuptake. The study group was then split according to whether participants had two copies of the long gene, two copies of the short gene or one copy of each. After they were presented with a version of the "trolley problem" those with the long form of the gene were significantly more willing to make a typically utilitarian decision and sacrifice one person to protect (in this case) five. A shorter version of the stretch of DNA responsible for inhibiting the re-uptake of serotonin has been shown to result in more anxious and neurotic individuals.

The gene regulating levels of **oxytocin** may have an influence on moral judgement insofar as they control the levels of these neurotransmitters. Walter et al.[101]

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[99] Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., Taylor, A., and Poulton, R. (2002). "Role of genotype in the cycle of violence in maltreated children." *Science*, 297(5582), 851-854.

[100] Marsh, A. A., Crowe, S. L., Henry, H. Y., Gorodetsky, E. K., Goldman, D., and Blair, R. (2011). "Serotonin transporter genotype (5-HTTLPR) predicts utilitarian moral judgments." *PLoS One*, 6(10), e25148.

[101] Walter, N. T., Montag, C., Markett, S., Felten, A., Voigt, G., and Reuter, M. (2012). "Ignorance is no excuse: moral judgments are influenced by a genetic variation on the oxytocin receptor gene." *Brain and cognition*, 78(3), 268-273.

genotyped 154 participants for a functional polymorphism associated with the oxytocin receptor gene (OXTR). They found that carriers of the C-allele "rated accidentally committed harm as significantly more blameworthy than non-carriers."[102] Another polymorphism present in the OXTR gene has also been linked to utilitarian responses to a range of moral dilemmas. In a study led by Regan Bernhard,[103] participants were presented with a moral judgement task consisting of 36 different scenarios. They found a significant difference in utilitarian responses between individuals carrying the C-allele compared to those who without this genetic variation.

Esvidence show that the receptor gene polymorphism AVPR1A regulates the re-uptake of **vasopressin.** Just as vasopressin has been linked to the monogamous behaviour of prairie voles, new research shows tentative links between pair bonding in humans and vasopressin regulation. Evidence of pair-bonding behaviour in men has been linked to the repeat polymorphism RS3 found also in gene AVPR1A.[104] Data was collected from 552 twin pairs using a pair bonding scale design to assess the quality of marital relationships. Those individuals with the RS3 polymorphism presented significantly lower scores and reported experiencing more marital problems than those lacking the polymorphism.

The length of the D4DR **dopamine** receptor gene will be indicative of whether an individual is more likely to search for thrills and engage in generally regarded dangerous activities such as bungee jumping, parachuting or even more risky and non-conventional sexual behaviours. A study led by Richard Epstein[105] used a tridimensional questionnaire to measure four distinct domains of temperament

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[102] Ibid. Page 268

[103] Bernhard, R. M., Chaponis, J., Siburian, R., Gallagher, P., Ransohoff, K., Wikler, D., Perlis, R. H., and Greene, J. D. (2016). "Variation in the oxytocin receptor gene (OXTR) is associated with differences in moral judgment." *Social cognitive and affective neuroscience*, 11(12), 1872-1881.

[104] Walum, H., Westberg, L., Henningsson, S., Neiderhiser, J. M., Reiss, D., Igl, W., Ganiban, J. M., Spotts, E. L., Pedersen, N. L., and Eriksson, E. (2008). "Genetic variation in the vasopressin receptor 1a gene (AVPR1A) associates with pair-bonding behavior in humans." *Proceedings of the National Academy of Sciences*, 105(37), 14153-14156.

[105] Ebstein, R. P., Novick, O., Umansky, R., Priel, B., Osher, Y., Blaine, D., Bennett, E. R., Nemanov, L., Katz, M., and Belmaker, R. H. (1996). "Dopamine D4 receptor (D4DR) exon III polymorphism associated with the human personality trait of novelty seeking." *Nature genetics*, 12(1), 78-80.

(novelty seeking, harm avoidance, reward dependence and persistence) in 124 participants. The results showed that those individuals with a particular polymorphism of gene D4DR consistently showed higher than average novelty seeking scores. These results were replicated in a study by Benjamin et al.[106]After investigating the relationship between the same D4DR polymorphism and novelty seeking behaviours in families, results suggested that this association was genetically transmitted from one generation to the next.

This brief overview of the genetic basis of emotional and moral responses have shown the potential to alter anti-social behaviours, pair bonding and even our utilitarian inclinations. The genetic basis of morality, it has been argued, can also be extended to the moral capacities of empathy and a sense of fairness. Next, I explore the grounds for this belief.

2.3.2.1 Genetic moral capacities: Empathy and a sense of fairness.

Amongst the potentially enhanceable dispositions, Savulescu gives special attention, due to their supposed biological basis, to empathetic and altruistic tendencies and a sense of justice.[107] Acording to Persson and Savulescu:

> *"the core of our moral dispositions comprises, first, a disposition to altruism, to sympathize with other beings, to want their lives to go well rather than badly for their own sakes."[108]*

These dispositions, they believe, are common to worldwide religions, like Confucianism, Christianity and Buddhism. Hume, on the other hand, believed that our sense of justice falls under the category of artificial virtue, a kind of virtue that arises from education and human convention and not from nature.[109] Existing

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[106] Benjamin, J., Li, L., Patterson, C., Greenberg, B. D., Murphy, D. L., and Hamer, D. H. Ibid."Population and familial association between the D4 dopamine receptor gene and measures of novelty seeking." 81-84.

[107] Persson, I., and Savulescu, J. (2008). "The perils of cognitive enhancement and the urgent imperative to enhance the moral character of humanity." *Journal of Applied Philosophy*, 25(3), 162-177.

[108] Ibid. Page 12

[109] Hume, D. (2011). *A treatise of human nature (Kindle edition)*: Courier Dover Publications. Book III, Part 2, Section I

research, such as that described above, indicates that these dispositions may be modified using biological means and may, therefore, prove Hume's theory to be inaccurate. The biological component of certain virtues such as altruism and a sense of fairness will have important implications for how we think about moral behaviour, in particular if moral dispositions can and should be manipulated.

Empathy is one moral capacity closely linked to altruism and surrounded by controversy. Whilst others, such as Baron-Cohen[110] and Jeremy Rifkin[111] feel that empathy is at the core of achieving a better society. Others such as Paul Bloom[112] argue for a rational restrain of this moral capacity to allow us to make better use of it.

What seems to be clear is the hereditability of the natural component of empathy. Twin studies have shown higher correlation in empathy among monozygotic than dizygotic twin. This was measured by evaluating empathic responses through the observable instances of prosocial behaviours, empathic concern and indifferent responses.[113]

William Damon[114] has attributed the capacity of empathy in humans to the innate disposition that can be found in babies from a very early age. Infants display these empathic behaviours when they respond with tears when they see someone upset or with expressions of pleasure when a person is happy. This capacity can be either developed or stagnated depending on the stimuli received by the child but the natural tendency to display empathic behaviour seems to be there from the start.

Early signs of a sense of fairness manifested by reciprocal behaviours in infants as young as 3 weeks old are displayed in the context of mother-child relationships.

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[110] Baron-Cohen, S., and Wheelwright, S. (2004). "The empathy quotient: an investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences." *Journal of autism and developmental disorders*, 34(2), 163-175.

[111] Rifkin, J. (1998). "Who will decide between defect and perfect?" *Washington post*, C4.

[112] http://www.bostonreview.net/forum/paul-bloom-against-empathy

[113] Zahn-Waxler, C., Robinson, J. L., and Emde, R. N. (1992). "The development of empathy in twins." *Developmental psychology*, 28(6), 1038.

[114] Damon, W. (1999). "The moral development of children." *Scientific American*, 281(2), 72-78.

Brazelton et al.[115] Have described how the infant's body movement and facial expression changes in reaction to her mother's behaviour. When being given signs of attention the child 's body would move in smooth circular movements. Conversely, the child's movements will become jerky and her face will draw away from her mother when the attention is not forthcoming. These are taken as early signs of recognition of unfair behaviours and are the precursor of later "tit-for tat" behaviours found at a later stage in the child's development. "Tit-for tat"[116] is understood to be the most basic display of a sense of fairness and it has been identified in toddlers from an early age. For example, a study involving 21 months old children showed how children preferred to help a person who had previously been nice to them over one who had been unfriendly and mean. As the authors of the study claim:

> *"these experiments indicate that early helping behaviors show characteristics of the rich reciprocal relationships observed in adult prosocial behavior."*[117]

The apparent biological basis of this empathy and a sense of fairness makes the prospect of genetic modification an achievable possibility. The consequences of being able to genetically modify our genetic moral dispositions could be far reaching. Imagine a scenario where we were able to influence how we form our bonds to one another, we may get a better understanding as to how to improve our relationships with those around us, particular those with whom we do not share familial or cultural ties. Even though we obviously lack any empirical data on the consequences of genetically manipulating the degree of social affiliation, it may not be unwise to speculate as to what the future will hold. The ethical evaluation that follows in Chapter 3 will help illuminate the issues we should consider as we embrace these technologies.

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[115] Brazelton, T. B., Tronick, E., Adamson, L., Als, H., and Wise, S. (1975). "Early mother-infant reciprocity." *Parent-infant interaction*, 33(137-154), 122.

[116] Persson, I., and Savulescu, J. (2008). "The perils of cognitive enhancement and the urgent imperative to enhance the moral character of humanity." *Journal of Applied Philosophy*, 25(3), 162-177. Page 174

[117] Dunfield, K. A., and Kuhlmeier, V. A. (2010). "Intention-Mediated Selective Helping in Infancy." *Psychological Science*, 21(4), 523-527. Page 523

2.3.2.2 The role of cognition on moral deliberation: Emotional moral enhancement versus the enhancement of moral reasoning.

Historically, moral decision making has been led by rationalistic approaches which explained away the role of emotions in our ethical decisions. Socratic and Kantian traditions supported the view that being a moral agent was not an accident, you had to know how and why you behaved in a morally correct manner. Depending on the agent's ethical framework this process typically involves evaluating issues concerning rights, justice or ensuring that virtues such as tolerance, altruism or benevolence are preserved.

Recent advances in neurosciences, however, have led us to have a better understanding on how the brain functions when taking morally laden decisions. This has led to some interesting insights which present challenges to those either advocating a purely rational model of moral decision making and those supporting an intuitionist view where our emotions take the lead in moral decision making. A biologically enhanced capacity for empathy will be of very little value if the agent did not put herself in situations where that capacity would be duly exercised. We need to practice to be moral in order to become effective moral agents. Also, having an enhanced moral capacity does not in itself tell us enough about how and when to use it in a morally appropriate way. It will be only through education and practice that those capacities will be of use to both the individual and society at large. Moral capacities cannot be considered in a vacuum, our cognitive capacities will teach us much about how to be moral in the same way that our moral capacities can guide us in using our enhanced cognition

Haidt and Greene[118] have recently speculated that moral judgment may have more to do with emotions and intuitions than with moral reasoning. This would seem to support the emotivist theories advocated by Hume and be in opposition with the Kantian rationalist outlook. However, what current research is really showing is that the parts of the brains in charge of both emotions and rational thinking have a role in moral reasoning

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[118] Greene, J., and Haidt, J. (2002). "How (and where) does moral judgment work?" *Trends in cognitive sciences*, 6(12), 517-523.

Using the trolley problem as a moral dilemma, a group of participants gave markedly different responses to the two different scenarios presented to them. In the first case they would be faced with pressing a switch which would divert the trolley from the track avoiding the death of five people but causing the death of one person by the diversion. In the second case, in order to save the same five people, the participant would need to push a bystander from a nearby bridge into the track to stop the trolley from killing the other five people. Even though both scenarios had the same outcome the response given by the participants was very different with the majority of them supporting the first scenario and rejecting the second one. Assessing the brain activity of the participants during the experiment showed that different parts of their brain was active when evaluating each of the two cases. The rational part would take a predominant roll when deciding to switch the direction of the trolley, however the emotional part was dominant when deciding whether to throw a bystander from the bridge to stop the inevitable death of the five people on the track[119].

Other evidence seems to show that patients with prefrontal cortex (ventral medial and polar sections) damage display poor moral judgment making them more likely to lie, steal, and even hurt themselves and others. Interestingly, the cognitive function of these patients does always appear to remain intact which may suggest that this type of moral behaviour has at least a non-rational component which heavily influences moral outcomes.[120]

Savulescu and Person, whilst they support the development of biological means to enhance moral capabilities, are against the development of cognitive enhancements because of the effect they will have on human's ability to cause each other harm.

> *"Cognitive enhancement by means of drugs, implants and biological (including genetic) interventions could thus accelerate the advance of science, or its*

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[119] Greene, J. D., Sommerville, R. B., Nystrom, L. E., Darley, J. M., and Cohen, J. D. (2001). "An fMRI investigation of emotional engagement in moral judgment." *Science*, 293(5537), 2105-2108.

[120] Greene, J., and Haidt, J. (2002). "How (and where) does moral judgment work?" *Trends in cognitive sciences*, 6(12), 517-523.

application, and so increase the risk of the development or misuse of weapons of mass destruction."[121]

On the other hand, Savulescu also writes:

"To be morally enhanced is to have those dispositions which make it more likely that you will arrive at the correct judgment of what it is right to do and more likely to act on that judgment." [122]

Savulescu goes on to acknowledge that these capacities will differ depending on the account of morality one choses to embrace. Arriving at the correct judgment may mean that emotional, dispositions are to be accompanied by cognitive capacities to help the moral decision-making process.

If we agree that our moral behaviour has both a cognitive and emotional component, preventing the development of cognitive enhancements could be to the detriment of our moral development. Let us assume that part of our moral decision-making is partly determined by how well we are exercising our moral reasoning in a given situation. This reasoning process will engage our capacity to evaluate contrasting versions of events and be able to systematically evaluate all scenarios. If we did find a cognitive enhancer which enables us to more effectively process information and more clearly understand the messages conveyed to us, it could work both as a cognitive and moral enhancer.

Discussing the possibility of moral enhancement, John Harris – whilst criticizing the chemical alteration of emotions that influence our moral behaviour - supports the development of smart drugs if these were to positively contribute to moral reasoning. John Harris believes that cognitive enhancement is the best way to improve ourselves morally. Moral enhancement should therefore be achieved through the improvement of our cognitive capacities.[123]

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[121] Persson, I., and Savulescu, J. (2008). "The perils of cognitive enhancement and the urgent imperative to enhance the moral character of humanity." *Journal of Applied Philosophy*, 25(3), 162-177. Page 162

[122] ibid.Page167

[123] Harris, J., and Chan, S. (2010). "Moral behavior is not what it seems." *Proceedings of the National Academy of Sciences*, 107(50), E183.

This debate highlights the need for a careful and detailed discussion of what morality entails. I acknowledge that this is an essential part of how and whether society should embrace these genetic technologies.

2.3.3 The ability to modify the genome

The modification of the genome is done via a number of gene editing techniques. Gene editing involves the replacement, deletion or insertion of DNA at a particular point of the individual's genome. There are a number of gene editing techniques currently employed, primarily they can be divided in two. One uses engineered nucleases (or molecular scissors) and the other one uses a number of viral systems to introduce the required changes into the genome.

One of the earliest techniques used to target and cut certain sequences of DNA was the Zinx Finger Nucleases or Zing Fingers (ZNFs). This technique developed in 1989 proved to be ground breaking and become the standard for editing cells in plant and animal models. In the field of therapy, it has been successfully used to make people more resistant to HIV. ZNFs were used to successfully target and destroy a gene in the cells of 12 patients suffering from HIV in a study conducted in 2014.[124] However, ZNFs is also a very complex process and carries very high costs. Newer techniques are overcoming the problems of cost and complexity and nowadays two new editing techniques are gaining ground: TALENS and CRISPR Cas9.

TALENS or Transcription Acivator Like Effector nucleases is a very similar technique to ZNFs developed in 2009. It is considered to be an evolution of the ZNFs technique with the advantage of having a much simpler design and application

The CRISPR Cas 9 technology came into use in 2012 and it has become the most popular and go-to technology. This gene editing complex is short for "clustered regularly-interspaced short palindromic repeats" and "CRISPR-associated protein 9". It has two components, an enzyme and a guide molecule. The guide molecule acts as a vehicle to take the enzyme to the target gene, once it reaches its destination the enzyme cuts the gene and either modifies it by changing its function, makes it more

[124] Tebas, P., Stein, D., Tang, W. W., Frank, I., Wang, S. Q., Lee, G., Spratt, S. K., Surosky, R. T., Giedlin, M. A., and Nichol, G. (2014). "Gene editing of CCR5 in autologous CD4 T cells of persons infected with HIV." *New England Journal of Medicine*, 370(10), 901-910.

active or eliminates it completely. Gene editing identifies and cuts pieces of DNA, CRISPR identifies the exact gene sequence that needs to be edited and the molecule Casp 9, which is a nuclease protein slices the gene by either replacing it or altering it by introducing a specific sequence of RNA. It is cheap, fast and accurate and, so far, it has been successfully used in the repair of faulty genes in human embryos. There are reports that successful DNA changes in experimental human embryos with inherited disease have been achieved using the CRISPR technology.[125] It can radically improve human health with the potential to stop the gene mutations causing cancer or eliminate the genes causing hereditary diseases. Scientists are looking into modifying the genes of mosquitos to prevent them from carrying malaria.

All these technologies provide us with different ways of altering the genome. The key thing is that they provide us with a very real possibility to intervene in the genome at embryonic stage and permanently modify the cognitive and moral capacities that I have discussed in this chapter. Whether we decide to go ahead and embrace these technologies depends on whether their application can survive the practical difficulties and an array of ethical and social justice concerns.

2.4 Practical challenges facing the germline enhancement of cognitive and moral traits.

Having carried out a review of the current evidence and potential for genetically enhancing cognitive and moral capacities, it is important to highlight the main practical difficulties that might slow down or stop these technologies altogether.

There are two main challenges that these new technologies must face before they could be considered as feasible enhancement options. One is the fact that a wide range of external factors need to also be in place for these interventions to successfully achieve their enhancement goal. The other one is that they will need to survive the objections posed by the genetic diversity argument.

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[125] Connor, S. (2017). "Rewriting Life - First Human Embryos Edited in U.S."*MIT Technology Review*. City.

2.4.1 The limitations faced by genetic engineering. From the fallacy of genetic determinism to the complexity of targeting polygenetic traits.

The assertion that one gene, or the modification of a gene, causes a specific trait defines the essence of what we call genetic determinism.[126]

Genetic determinism, however, can be challenged by the complex process that is required in transforming genotypic traits into phenotypic characteristics. The role that the environment plays in the expression of genes is of paramount importance. Genetic interventions will not be effective in a vacuum. They will need to be accompanied by a number of environmental factors that enable the genetic predisposition to become an actual capacity. Nicholas Agar explains how some genes lead to the same or very similar phenotype in most environments, whilst others seem to vary in response to what he calls "seemingly inconsequential environmental changes."[127] This is explained by a phenomenon called epigenesis.[128] This scientific term indicates that there are other factors, apart from the gene, that influence whether gene expression takes place and therefore the disease develops. These other factors might be environmental or they might originate in internal chemical processes.

David Resnik provides us with some examples of how environmental influence is visible in our everyday life.[129] He claims that, in the same way that someone with a genetic potential to reach a height of 6ft might never do so without the appropriate levels of nutrition or healthcare, someone with a genetic predisposition to alcoholism will avoid this addiction if they are never exposed to alcohol. Similarly, the effect of certain genes can be counteracted by the intervention of certain environmental measures. A well known example is how we manage children affected by phenylketonuria. Phenylketonuria is a genetic condition caused by a

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[126] Resnik, D. B., and Vorhaus, D. B. (2006). "Genetic modification and genetic determinism." *Philosophy, ethics, and humanities in medicine : PEHM*, 1(1), E9. Page 3

[127] Agar, N. (1998). "Liberal eugenics." *Public affairs quarterly*, 12(2), 137-55. Page 140

[128] Wessel, A. (2009). "What is epigenesis? or Gene's place in development." *human_ontogenetics*, 3(2), 35-37.

[129] Resnik, D. B., and Vorhaus, D. B. (2006). "Genetic modification and genetic determinism." *Philosophy, ethics, and humanities in medicine : PEHM*, 1(1), E9. Page 4

mutation in the gene for the hepatic enzyme phenylalanine hydroxylase (PAH). Children born with this mutation suffer from a form of mental retardation, however, a strict diet virtually free of meat, fish, eggs and most dairy products would lead to a child leading a virtually normal life. In this case, the environmental influences counteract the effects of our biological commands. Focusing on the possibility to genetically enhance our cognitive capacities for example, these may never be realised if the child is reared in an unsupportive familial and social environment that does not provide her with adequate educational or nutritional resources. Likewise, a capacity that enhances your practical reasoning skills will be of very little use to individuals if they choose instead not to develop it and follow a life of reckless abandonment instead.

Another consideration is that differences in nutritional and social environmental exposures can lead to heritable changes in gene expressions and phenotypes that are not caused by changes to the DNA sequence itself. The effects that nutrition can have in genetic inheritance has been studied in human populations. For example, the connections between malnutrition and limited access to food and the effect this keeps having across generations long after the nutritional aspect is no longer a problem, have been well documented.[130]

Non environmental factors also affect the expressions of genes. Sometimes a mutation occurring in a specific gene might prevent its expression. For example, research on disorders traced back to specific genes has shown that even when the mutation is associated with a particular disease, there is no guarantee that the disease itself will develop.

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[130] Martins, V. J. B., Toledo Florêncio, T. M. M., Grillo, L. P., Franco, M. d. C. P., Martins, P. A., Clemente, A. P. G., Santos, C. D. L., Vieira, M. d. F. A., and Sawaya, A. L. (2011). "Long-Lasting Effects of Undernutrition." *International Journal of Environmental Research and Public Health*, 8(6), 1817-1846.

Roseboom, T. J., Van Der Meulen, J. H., Ravelli, A. C., Osmond, C., Barker, D. J., and Bleker, O. P. (2001). "Effects of prenatal exposure to the Dutch famine on adult disease in later life: an overview." *Molecular and cellular endocrinology*, 185(1), 93-98.

Painter, R., Osmond, C., Gluckman, P., Hanson, M., Phillips, D., and Roseboom, T. J. (2008). "Transgenerational effects of prenatal exposure to the Dutch famine on neonatal adiposity and health in later life." *BJOG: An International Journal of Obstetrics & Gynaecology*, 115(10), 1243-1249.

Failing to acknowledge the non-genetic factors needed to realise our native talents will make us fall into "the fallacy of genetic determinism." [131] According to this view all our characteristics would be entirely defined by our genes, however as the examples above show:

> *"In addition to genetic foundations, the individual's environment, from the non-genetic chemicals in each of that individual's cells to the world around her, plays a substantial role in the development of her characteristics and capabilities."*[132]

The multifactorial aspect of genetic traits therefore shows that even if a genetic pre-disposition is present, further requirements are needed to ensure the actual development of the selected trait takes place.

Even if we ignore the multifactorial and epigenetic challenges associated with the activity of the genes and the development of the specific traits, the claim of genetic determinism can be fought off with an appeal to technology. It has been proposed that genetic interventions could be accompanied by a "switch on/off" facility that will determine whether the enhanced capacity is activated depending on whether it suits the individual's chosen life plan. Gregory Stock[133] described how this could be achieved through the insertion of an "auxiliary" artificial chromosome carrying the appropriate genetic information and a mechanism so that the expression of the relevant gene could be switched on or off as per our preference. Should this become a possibility, this switch on/off system could become a very effective way to pick and choose natural capacities according to the individual's own preferences.[134]

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[131] Etieyibo, E. (2011). "Genetic enhancement, social justice, and welfare-oriented patterns of distribution." Bioethics. Page 301

[132] Ibid.

[133] Stock, G. (2003). Redesigning humans: Choosing our genes, changing our future: Houghton Mifflin Harcourt. Pages 65-70

[134] This switch on/off feature may be more appropriate for those capacities that will be present independently of whether they are developed or not rather than the enhancement of cognitive interventions. For instance, an artificial chromosome which determines a specific eye or hair colour can be a suitable example. Our offspring will not need to carry out any specific exercise or embrace some strict dietary requirements to develop a specific eye or hair colour. A switch on/off facility seems like a reasonable 'add on' to this genetic trait. It is important to note however that the presence of this switch on/off facility might not be sufficient to justify the permissibility of these particular capacities, other ethical considerations will need to be evaluated to reach such conclusion. The analysis of these capacities however is outside the scope of this thesis

Finally, the polygenic character of certain cognitive and behavioural characteristics poses another difficulty to the successful and accurate modification of traits via genetic means. It is often the case that phenotypic representations are dependent on the behaviour of more than one gene. Complex traits such as intelligence or athletic abilities are often cited as examples of multiple genes traits.

Studies of the genetic origins of disease show that disorders rarely have a monogenic origin. That is to say the cause of the disease is often not traceable to a single genetic mutation. Furthermore, some genes regulate more than one trait or characteristics, therefore intervening in one gene with the aim of affecting one particular trait can result in unexpected or undesirable changes in a different trait. In the field of infectious diseases for example, it has been found that a variant of the DARC gene which offers protection against malaria seems to make people more susceptible to HIV.[135]

All these factors are obstacles to the direct modification of traits via genetic modification. The successful implementation of these technologies will depend, to a degree, on how well scientists are able to navigate these hurdles.

2.4.2 Undermining genetic and social diversity

One last point to consider before exploring the potential ethical objections to these technologies is whether they are likely to undermine genetic diversity.

The danger that the introduction of germline enhancements is going to endanger the genetic diversity of the human race is one of the objections faced by the supporters of these new technologies. First, in order to understand the issue of genetic diversity we need to provide a definition. Christian Wolfe defines genetic diversity as "the variety and frequency of different genotypes or combinations of different genotypes within a population."[136] The higher the genetic variability in a population, the higher

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[135] He, W., Neil, S., Kulkarni, H., Wright, E., Agan, B. K., Marconi, V. C., Dolan, M. J., Weiss, R. A., and Ahuja, S. K. (2008). "Duffy Antigen Receptor for Chemokines Mediates< i> trans</i>-Infection of HIV-1 from Red Blood Cells to Target Cells and Affects HIV-AIDS Susceptibility." *Cell host & microbe*, 4(1), 52-62.

[136] Wolfe, C. (2009). "Human Genetic Diversity and the Threat to the Survivability of Human Populations." *The Institute for Applied & Professional Ethics Archives*. Page 3

the number of phenotypic[137] variability. Preserving the phenotypic variability of the population is important insofar as the higher the variability, the better chance the population overall will have to preserve evolutionary change. Critics of germline intervention claim that the popularity of certain desirable traits will lead to a decrease in the diversity of the genetic pool threatening the long term survival of the human population. This is what is commonly knows as the Genetic Diversity Argument (GDA).[138]

It is unclear to what extent the dangers suggested by GDA will become a reality since the technologies we are evaluating are not yet available and it is difficult to ascertain to what degree they will be accepted by the general population. Furthermore, the effects on genetic variability also depend on an account of genetic determinism that has been shown to be unconvincing. Nonetheless research indicates that the genetic diversity of maize has been severely curtailed by the genetic selection of crops to accommodate the growing demand for food.[139] The concern associated with this lack of genetic variety is whether these crops will be able to survive a plant plague severe enough to threaten the world's food supply.

Linked to the decrease in genetic diversity is the fear that a decrease in the variety of human forms might give way to what Dov Fox calls a "tyranny of sameness".[140] Homogenous parental decisions that lead to similar enhancements chosen for their children might lead to a narrower range of behavioural and cultural norms. The danger being that an appreciation and tolerance of plural and diverse views might diminish as these enhancements become commonplace.

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[137] The phenotype of an individual is the result of the interaction of the individual's genotype with the environment. They are the individual's observable characteristics or traits after the individual's genetic code has been expressed.

[138] Resnik, D. B. (2000). "Of Maize and Men: Reproductive Control and the Threat to Genetic Diversity." *Journal of Medicine and Philosophy*, 25(4), 451-467. Page 451

[139] Fu, Y.-B., and Somers, D. J. (2009). "Genome-wide reduction of genetic diversity in wheat breeding." *Crop Science*, 49(1), 161-168.

[140] Fox, D. (2007). "The Illiberality of 'Liberal Eugenics'." *Ratio*, 20(1), 1-25. Page 23

2.5 Conclusion

This chapter has shown how the modification of some of our cognitive and moral capacities is already a reality. This is more pronounced in the field of pharmacology where there are indications of successful enhancement both at the therapeutic level and with healthy volunteers.

Recent genetic advances also show promise. The identification of specific genes and neurotransmitters that are linked with cognition and pro-social behaviours has opened the door to research investigating the augmentation of these capacities.

Although, understandably, genetic studies in healthy volunteers are limited, research in animal models provides us with initial evidence that the genetic alteration of these capacities is possible. This might eventually lead us to the tantalising prospect of one day applying these technologies to the genetic cognitive and moral enhancement of humans.

This review, has tried to outline the current evidence and practical difficulties involved in the alteration of these capacities. Current evidence provides us with grounds for beginning the process of ethically evaluating cognitive and moral germline genetic enhancements their potential genetic modification before they become a reality.

Chapter 3. An overview of the main ethical arguments against germline enhancements

Whether or not the genetic enhancement of our offspring becomes a real possibility in the not too distant future there is no doubt that choosing to embrace germline cognitive and moral enhancements will be marred with difficulties from the very beginning. The introduction of these technologies should be the subject of a thorough scrutiny from scientists, ethicists, policy makers and society at large.

The aim of this chapter is to outline the most salient issues associated with germline interventions. Although the focus of this dissertation is the assessment of the impact of a cognitively and morally genetically enhanced society on justice, it is important to also highlight other equally important ethical concerns. This is not meant to be a critical evaluation of each of the ethical arguments, it merely serves as an exposition of the main ethical objections associated with their implementation.

The list of ethical concerns outlined is not exhaustive and it focuses on the effect that these technologies may have on future generations. Although discussed as generally applying to all germline enhancements, I have chosen those ethical concerns that would be particularly relevant to technologies designed to enhance both cognitive and moral capacities. These range from fears of falling back into old coercive eugenic practices, to concerns about how genetic modification might affect the autonomy, dignity and sense of authenticity of our future children. A brief enquiry into issues of implicit and explicit coercion and the effect that these technologies have on perceptions of responsibility, complete the chapter.

Should we ever consider to embrace these technologies, a careful scrutiny of these ethical considerations will need to take place before they are part of our everyday lives.

3.1 The shadow of eugenics.

The ghost of early 20th century eugenic[141] practices has not gone away. It still casts a long shadow on the contemporary ethical debates surrounding genetic

[141] Eugenics originates from the Greek word eugenes meaning "well born".

technologies. Scientific discoveries have often been used to justify dubious social policies. Examples include the forced sterilisation of those believed to be feeble-minded in 1930s US, Sweden, Denmark or Canada and the Nazi 'Rassenhygiene' (racial hygiene) implemented by the Third Reich with thousands killed to stop the proliferation of their genes. Eugenics in the early part of the 20th century came in the form of what was later known as "negative eugenics". This practice focused on stopping certain types of people from being born or reproducing in order to "protect the health of the nation or of mankind as a whole."[142] Through government enforced policies, a certain kind they perceived as undesirable, such as the feeble-minded, had their reproductive rights curtailed or were stopped from being born at all. These coercive policies serve as a constant reminder of how gene talk can be used to serve the purposes of those having a morally suspect agenda.[143] The crimes committed in the name of genetic purity and with the false pretence of pursuing a common social good are all plain for us to see. It is also clear, however, that these atrocities were not caused by the technological advances themselves. They were caused, at least in part, by excessively controlling governments that prioritised their warped social vision over some individuals' rights and liberties.

The issue of coercive negative eugenics is complex, and as Buchanan[144] suggests, it is unlikely that utilitarian tendencies trumping rights-based ideologies were the only contributing factors. An over-reliance on poor scientific evidence advocating genetic determinism and the need to find a scapegoat for society's ills also contributed to a distortion of moral judgement. Eugenics supported the thought that they had found the reason for criminality and poverty in the genes, entirely dismissing the overwhelming effect that the environment has when interacting with our biology.

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[142] Buchanan, A. (2007). "Institutions, beliefs and ethics: Eugenics as a case study." *Journal of Political Philosophy*, 15(1), 22. Page 28

[143] For a thorough analysis on how scientific advances were used to justify eugenic policies in Germany during late 19th and early 20th century see: Weighmann, K. (2001). "In the name of science. The role of biologists in Nazi atrocities: lessons for today's scientists

" *European Molecular Biology Organization*, 2(10).

[144] Buchanan, A. (2007). "Institutions, beliefs and ethics: Eugenics as a case study." *Journal of Political Philosophy*, 15(1), 22.

Understandably, scientific advances have brought along fears that these eugenic practices can resurface and these now extend to the alteration and modification of those yet to be born. This contrasts to the negative eugenics policies aimed at stopping certain types from coming into being and brings subtly different albeit related ethical concerns. Bringing about a certain type of individual through genetic modification is known as positive eugenics. Positive eugenics provides individuals with the power to intervene in the genetic make-up of future offspring. A key factor in establishing whether this renewed fear is justifiable is thought to derive from whether these new practices are likely to be imposed on individuals. Some authors think that preserving the rights that individuals have in taking procreative decisions is key in order to avoid accusations of coercion in the implementation of genetic enhancements.

This is the view taken by authors such as Nicolas Agar in his book *Liberal Eugenics*[145]. State coercion, control and the belief that a particular conception of the good should be imposed on society are at the heart of the old eugenics. Conversely, the liberal type of eugenics defended by Agar is dominated by the hallmark of state neutrality regarding reproductive choices. Furthermore, Agar thinks that individuals will have access to the information regarding available genetic interventions enabling them to make choices for their offspring in line with their life plans and world views.[146] According to Arthur Caplan, as long as the reproductive choices of parents are free and informed then "there is no reason to think that such a choice is immoral on grounds of force or coercion."[147]

Eliminating the coercive aspect of eugenics seems to eliminate the main concern that the old practices conjure up and shifts the focus to other ethical issues that need to be considered to ascertain the permissibility of these technologies. Once the coercion has been discarded as a concern, authors have begun to considered whether that reproductive freedom itself requires some qualification.

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[145] Agar, N. (1998). "Liberal eugenics." *Public affairs quarterly*, 12(2), 137-55.

[146] Ibid. Page 137

[147] Caplan, A. L., McGee, G., and Magnus, D. (1999). "What is immoral about eugenics?" *British Medical Journal*, 319(7220), 1284-U19. Page 336

Limiting this freedom is often justified on the basis of the view that importance must be given to the human nature, autonomy, authenticity and dignity of future people. The following section aims to provide some clarification of these arguments.

3.2 Altering human nature: Effects on the autonomy, dignity and authenticity of future people

Some claim that future persons have a right to receive an unaltered genome. This right is enshrined in the 1997 Human Rights and Biomedicine Act.[148] Under this legislation, genetic modification is only permitted for therapeutic or diagnostic purposes and as long as it does not introduce any modification to the genome of future persons. That is to say, in law, individuals have a right to inherit genetic material that has not been intentionally modified. However, the interesting question is to investigate what may motivate the development of such legislation. I hope that this section, may help to elucidate why some thinkers and many members of the public may be so keen to keep the biological component of our nature intact.

It is difficult to disentangle the concept of human nature from those of human autonomy, dignity and authenticity. Worries about modifying the nature of future people are in fact often presented in terms of how these changes will affect these qualities.

Next, I provide a concise summary of the arguments against germline technologies that are anchored in the protection of autonomy, dignity, and authenticity.

Starting with the argument from **autonomy,** we find that different accounts of autonomy offer different approaches to interpreting this self-governing capacity. Accounts developed by Frankfurt[149] and Dworkin[150] suggest that the degree of one's autonomy depends on the extent to which the individual's higher and lower-order desires cohere. This account defends the view that, in order to be autonomous

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[148] COUNCIL, O. E. (1997). "Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine: Convention on Human Rights and Biomedicine." *Oviedo: COE*. Page 4

[149] Frankfurt, H. G. (1971). "Freedom of the Will and the Concept of a Person." *The journal of philosophy*, 68(1), 5-20.

[150] Dworkin, G. (1988). *The theory and practice of autonomy*: Cambridge University Press.

individuals should be able to critically reflect on their choices and desires and freely review them whenever appropriate. In this sense autonomy is evaluated on how our desires or volitions are reflected in our actions. If the freedom to act upon our volitions is violated by genetic interventions through a narrowing of our opportunities, then those interventions would be considered to harm our autonomy.

Joel Feinberg's[151] understanding of autonomy is related to this account insofar as autonomy is conceived in relation to freedom of choice and available opportunities. According to this view future children should be granted the right to "reach maturity with as many open options, opportunities and advantages as possible."[152] The child's autonomy equates, according to Feinberg, to the "right to an open future". The potential narrowing of options of our offspring caused by the genetic predetermination of their genome was also one of the main threats that Habermas identified with newly emerging technologies:

> *"Eugenic programming of desirable traits and dispositions ... gives rise to moral misgivings as soon as it commits the person concerned to a specific life-project or, in any case, puts specific restrictions on his freedom to choose a life of his own."*[153]

Both Feinberg and Habermas highlight the danger of choosing to enhance our offspring in a manner that compromises their autonomy, understood as their ability to choose their own path, by predisposing the future child towards a particular life path. According to this view, parents would have a responsibility to ensure that children's capacities for autonomous choice and judgment are nurtured so that they are able to choose and pursue a wide range of life plans. Buchanan supports this view and claims that, although the right to an open future will not immediately rule out genetic interventions, it will however limit the range of permissible interventions to those that "do not so narrow children's range of opportunities as to

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[151] Feinberg, J. (2007). "The child's right to an open future."

[152] Ibid. Page 80

[153] Habermas, J. (2003). *The future of human nature*: Blackwell Pub. Page 61

violate their right to an open future." [154] Agar echoes this view with his worry that some interventions might rule out or compromise particular life plans:[155]

> *"Capacity enhancements boosting an individual's chances of successfully pursuing a given life plan will often reduce that individual's chances of successfully pursuing alternative life plans. A stock market trader needs to marry quickness of decision with aggression. These traits would be harmful in a poet or painter for whom reflection is demanded."*[156]

Habermas's account of autonomy is characterised by the importance given to self–authorship. The special status he gives to the inviolability of human nature is justified for its role as "crucial for our capacity to see ourselves as the authors of our own life histories, and to recognise one another as autonomous persons."[157] This statement suggests that avoiding the manipulation of human nature via genetic means would protect our ability to act in accordance with our own motives and therefore regard ourselves and each other as autonomous beings.

As our offspring are unable to consent to these interventions, their right to decide about their future would be harmed. In short, children would not be able to see themselves as the authors of their own lives.

Dena Davis's condemnation of methods of what she calls "direct procreation"[158], such as sperm sorting and pre-implantation genetic diagnosis (PGD) can also be extended to germline enhancements. The possibility to test and potentially modify specific traits in embryos before implantation, so Davis believes, raises questions about the respect given to the autonomy of the future child. Davis interprets the threat to autonomy by these newly emerging technologies in terms of the expectations that parents may have about the kinds of lives their children will lead. The kind of emotional and financial investment that parents put in choosing their

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[154] Buchanan, A., Brock, D. W., Daniels, N., and Wikler, D. (2001). *From chance to choice: genetics and justice*: Cambridge University Press. Page 180

[155] Agar, N. (1998). "Liberal eugenics." *Public affairs quarterly*, 12(2), 137-55. Page 149

[156] Ibid.

[157] Habermas, J. (2003). *The future of human nature*: Blackwell Pub. Page 25

[158] Davis, D. S. (2009). "The parental investment factor and the child's right to an open future." *Hastings Center Report*, 39(2), 24-27. Page 24

child's traits would incur a sense of entitlement to the expected result. In the context of cognitive enhancements in particular, parents may force their children to a path of high academic achievement that their child might not have chosen freely. Effectively, the parent's expectations about their children's future might result in narrowing the range of life plans open to their children.

Detractors of genetic interventions have often claimed that altering our nature by genetic means would undermine the Kantian conception of **human dignity**, which is anchored on the "special worth" of human beings and their ability to act according to their own will, having "freedom from dependence on interested motives which constitutes the sublimity of a maxim and the worthiness of every rational subject."[159] This special worth and freedom to act upon our own will implies that there is a duty not to treat humans as mere instruments of our own desires and aspirations. Thinkers such as Leon Kass and Francis Fukuyama[160] believe that the genetic engineering of our future children changes the way we are connected to them. In their view, the parent- child relationship becomes one between the "maker" and the "made". Children are being treated as a means to the ends set by the parents or society who decide to enhance them so that they become products of their own creation. The self-worth of our future children, they argue, will be damaged by being "instrumentalised" by their parents. This would not be the case if parents were to follow a process of natural conception where they have a limited amount of control over who their children might be. Through the genetic manipulation of our offspring, parents instrumentalise their children making them a product of their own preferences. The future person is then unable to feel like they are the outcome of their own choices, unable to pursue their own personal goals and develop their own moral conceptions.[161]

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[159] Kant, I. (1964). "Groundwork of the Metaphysic of Morals.(Paton, HJ trans.)". City: Harper Torchbooks, New York, NY (original work published in 1785). Page 106

[160] Kass, L. (2003b). *Beyond Therapy, Biotechnology and the Pursuit of Happiness*. The President's Council on Bioethics, Washington DC, Kass, L. R. (2000). "Triumph or tragedy? The moral meaning of genetic technology." *The American journal of jurisprudence*, 45, 1-16.

Fukuyama, F. (2004). "Transhumanism." *Foreign Policy*(144), 42-43.

[161] Habermas, J. (2003). *The future of human nature*: Blackwell Pub.

This criticism is also supported by Michael Sandel[162] who also highlights the damage in the parent-child relationship. Sandel famously highlighted the dangers that genetic modification poses to our relationship with our future offspring when we treat them as mere artefacts of our own making. He believes that behind intervening in our children's genome lies a desire to fulfil the parents own desires and aspirations. It is, he writes:

> *"a kind of hyperagency – a Promethean aspiration to remake nature, including human nature, to serve our purposes and satisfy our desires. The problem is not the drift to mechanism but the drive to mastery. And what the drive to mastery misses and may even destroy is an appreciation of the gifted character of human powers and achievements...The problem is not that parents usurp the autonomy of a child they design. The problem lies in the hubris of the designing parents, in their drive to master the mystery of birth."* [163]

There is some value, according to Sandel, in accepting our children as gifts and appreciating the fact that we cannot choose to have the kind of children we want restrains the human tendency towards hubris.[164]

The arrogance associated with "Playing God" by potentially creating our children to suit our own preference not only offends the human dignity of our future offspring but it also expresses, what Sandel considers, a damaging disposition towards seeing ourselves as the "masters of our own nature."[165]

A related concern derived from our ability to dictate the genetic dispositions of our future children is how this might affect their sense of **authenticity**. Discussions of authenticity are often associated with how well people can identify themselves with their actions. Carl Elliott rejects enhancements because they are alien to what makes us who we are. For a life to be authentic it needs to be uniquely yours and the use of external enhancements would undermine this uniqueness and take us further away

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[162] Sandel, M. (2004b). "The case against perfection: what's wrong with designer children, bionic athletes, and genetic engineering." *Atlantic monthly (Boston, Mass.: 1993)*, 292(3), 50.

[163] Sandel, M. (2004a). "The case against perfection." *The Atlantic Monthly*, 293(3), 51-62. Page 55

[164] Ibid. Page 60

[165] Ibid. Page 62

from our true selves. Furthermore an authentic life is directly linked to self-fulfilment understood as "discovering and pursuing your own values and your own particular talents".[166] This view of authenticity, according to Elliott, is characterised by its uniqueness. Moreover, a feeling of self-fulfilment is linked to a meaningful life, which is why we should try to preserve it. Another way of expressing the potential damage that genetic interventions do to our sense of who we are is found in identity-preserving arguments. Authors, such as Walter Glannon,[167] argue that enhancing an individual's mental capacities is not so much about improving that person but rather what we are doing is altering that individual's identity. If we want to defend this type of enhancement against this particular criticism, we need to show that the interventions we are dealing with are identity preserving. I have already described how Michael Sandel[168] believed that the instrumentalisation of our children could harm their human dignity. Now, his view of humanity, anchored in a concept of "giftedness" whereby our talents are not wholly our own, and as such we are restricted in the way in which we can alter them, begets a sense of humility towards the unexpected. The fact that we don't have complete control over what makes us, leaves us open to the unexpected. This openness over what the future holds is conducive to a certain humility much needed, according to Sandel, when facing these technological advances. It is through the disruption of our nature through genetic intervention that we are at risk of threatening our authentic selves.

The argument for authenticity cannot be complete without considering the issue of naturalness. Some authors believe that it is the potential loss of a sense of naturalness in what we are pursuing that can really damage the authenticity of human beings. The unnaturalness arising from the use of germline interventions comes from a feeling of detachment between our achievements and the means that have been used to reach those goals.[169] There is a sense according to Kass that "the

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[166] Elliott, C. (1998). "The tyranny of happiness: Ethics and cosmetic psychopharmacology." *Enhancing human traits: Ethical and social implications*, 177-188.

[167] Glannon, W. (1998). "Genes, embryos, and future people." *Bioethics*, 12(3), 187-211.

[168] Sandel, M. J. (2007). *The Case against Perfection: Ethics in the Age of Genetic Engineering*: The Belknap Press of Harvard University Press.

[169] Kass, L. (2003a). "Ageless Bodies, Happy Souls." *The New Atlantis*, 1, 9-28.

"naturalness" of means matters."[170] The use of these new technologies removes humans from familiar contexts that have characterised their experience so far. There is a sense that by embracing these technologies, we are failing to be genuine in our pursuits.

3.3 Drawing the line at therapy

The definition of genetic enhancement has typically been determined by its relationship to the concept of therapy and particularly how it differs from it. The widely discussed distinction between therapy and enhancement is important insofar as it is often used as a way to draw moral conclusions about the desirability or not of the use of emerging biotechnologies. Nick Bostrom[171] suggests that the therapy-enhancement dichotomy comes from the assumption that therapy is generally understood as aiming to "fix" specific diseases or injuries whilst enhancement aims to improve an organism over and above its healthy state.[172] This way to define therapy and enhancement coincides with the one offered by the President's Council on Bioethics:

> *"A therapy, roughly defined, is a treatment for a disorder or deficiency, which aims to bring an unhealthy person to health. An enhancement is an improvement or extension of some characteristic, capacity, or activity."*[173]

Bio-conservatives[174] claim that it is important to keep this distinction since it does seem to be an accepted intuition for the majority of the population and provides a "moral warning flag" which prompts us to assess the morality of certain biomedical interventions.

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[170] Ibid. Page 22

[171] Bostrom, N., and Roache, R. (2007). "Ethical issues in human enhancement", in J. Ryberg, T. Petersen, and C. Wolf, (eds.), *New Waves in Applied Ethics*. Palgrave Macmillan. Page 1

[172] Ibid.

[173] The President's Council on Bioethics. (2002). "Staff Working Paper - Distinguishing Therapy and Enhancement". City: Washington DC. Page 1

[174] Bio-conservatism is a philosophical stance which advocates extreme caution about the use of newly emerging technologies. Proponents of this movement are thinkers such as Leon Kass and Francis Fukuyama.

W.F. Anderson believes that the role of medicine should be confined to the treatment of disease, leaving enhancements outside the scope of medicine

> *"On medical and ethical grounds we should draw a line excluding any form of enhancement engineering. We should not step over the line that delineates treatment from enhancement."*[175]

Anderson seems to express the view that the traditional goal of medicine is the restoration of the human body to its normal state and this is the way it should continue.

Similarly, Eric Juengst has described how the concept of disease should be used to delineate the duties of the medical profession:

> *"Where the human problems anticipated by an intervention cannot be tied together into a diagnosable disease entity, with its recognizable constellation of subjective symptoms, physical signs and causes, it should not be adopted as a proper part of medical practice."*[176]

These views are well rooted in the traditional role that medicine has had since its origins. In antiquity the concept of enhancement in medical terms had not yet come into appearance restoring the functioning of the bodies to their normal state was the goal. This was an uncontroversial position because improvement beyond nature was not considered to be a possibility. Urban Wiesing[177] describes how the purpose of medicine was to turn discrasia into eucrasia i.e., restoring the balance of the four humours (phlegm, blood, and yellow and black bile) in the human body. The idea that the human condition should not be improved beyond its original state

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[175] Anderson, W. F. (1990). "Genetics and Human Malleability." *The Hastings Center Report*, 20(1), 21-24.

[176] Juengst, E. T. (1997). "Can Enhancement Be Distinguished from Prevention in Genetic Medicine?" *Journal of Medicine and Philosophy*, 22(2), 125-142. Page 15

[177] Urban Wiesing[177] provides an excellent summary on how over the course of history this *restitutio ad integrum* gradually has changed to what he calls a *transformatio ad optimum*, changing the focus of medicine towards bettering the human physical and mental condition beyond its normal status: "Whereas the people of antiquity viewed themselves as a well-ordered microcosm, and medieval people as the pinnacle of God's creation, modern people saw themselves in many different ways, more like a machine, in a technical sense, and finally as the flawed result of chance evolutionary processes" Wiesing, U. (2009). "The History of Medical Enhancement: From Restitutio ad Integrum to Transformatio ad Optimum?", in B. Gordijn and R. Chadwick, (eds.), *Medical Enhancement and Posthumanity*. Springer Netherlands, pp. 9-24.

continued during the Middle Ages, the focus being directed towards restoring people to the level pre-determined by God.

Medicine consistently followed the *restitutio ad integrum doctrine*, by which the aim of any given treatment was to restore the normal functioning of the human body. There was no consideration given to the possibility of taking the human body beyond its original functionality.

Supporting the difference between therapy and enhancement as a way of ethically evaluating an intervention depends on our ability to successfully define health. In order to do so, philosophers employ a number of theoretical frameworks.

First, under the biological/functional account of health, disease is identified from a statistical point of view and defined as those deviations from the natural functional organization of a species.[178] Similarly, Boorse uses statistical normality to define health:

> *"Health as freedom from disease is then statistical normality of function, i.e., the ability to perform all typical physiological functions with at least typical efficiency."*[179]

A diseased individual will lack capacities that normal individuals of her species do possess. Following this functional approach, Norman Daniels extends this definition and claims that mental and physical disease or impairment are "adverse departures from species-typical normal functional organization or "normal functioning," for short."[180] These species typical functions are those which have contributed to the reproduction and survival of human beings. Norman Daniels introduces a version of the "normal function" model as a useful guide in differentiating treatment from enhancement. In his own words:

> *"The treatment-enhancement distinction draws a line between services or interventions meant to prevent or cure (or otherwise ameliorate) conditions that*

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[178] Boorse, C. (1975). "On the Distinction between Disease and Illness." *Philosophy & Public Affairs*, 5(1), 49-68.

[179] Boorse, C. (1977). "Health as a Theoretical Concept." *Philosophy of Science*, 44(4), 542-573. Page 1

[180] Daniels, N. (1998). "Negative and positive genetic interventions: is there a moral boundary?" *Science in context*, 11(3-4), 439-53.

we view as diseases or disabilities and interventions that improve a condition that we view as a normal function or feature of members of our species."[181]

According to Daniels, any intervention aimed at restoring an individual's "species-typical" functions would be considered as therapy, whereas if the treatment employed aims to improve those capacities it would then need to be considered as enhancement. The line dividing therapy and enhancement will therefore be drawn in terms of those specific functions which will fulfil the goals of a given organism, anything which disturbs the normal working of those specific functions should be subject to therapeutic intervention.

Second, the social account of health defines disease and health as contingent and highly dependent on social, moral and cultural norms. Under this framework, our values, attitudes and social and institutional arrangements affect how disease and health are defined. Norman Daniels agrees with the way our cultural and social environment affect our concept of disease and, in 2000, he wrote:

"It is our norms and values that define what counts as disease, not merely biologically based characteristics of persons."[182]

The implication of this assertion is that, independently of whether someone meets the species typical criteria of health, an individual may be considered diseased by a given society. In other words, someone deviating from the societal, moral or cultural norm, may be considered not healthy even when this person's functioning fits within the species typical or normal functioning range.

Both the functional and social normality accounts may offer very different and, perhaps, opposing, concepts of normality. This may be problematic to those relying on the therapy-enhancement distinction for moral guidance on decisions relating to genetic interventions.

Regardless of these difficulties, supporters of the therapy-enhancement distinction consider it a valued tool for establishing the moral permissibility of genetic

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[181] Daniels, N. (2000). "Normal Functioning and the Treatment-Enhancement Distinction." *Cambridge Quarterly of Healthcare Ethics*, 9(03).

[182] Ibid.

interventions. Whatever account is chosen to offer moral guidance, Eric Juengst[183] still insists that a line used to differentiate therapy form enhancement can be drawn even when it is difficult to find clear cut off points.

3.4 The effect of enhancement on accountability and responsibility.

The possibility of enhancing the capacities of individuals raises questions of responsibility affecting both the enhanced future person and the parent deciding to enhance their future offspring.

As responsibility seems to diminish as our capacities decrease, so Nicole Vincent humorously points out in her discussion of how responsibility tracks capacity "No one expects more of Clark Kent but everyone expects Superman to save the world."[184]

Even if the use of genetic enhancements does not endow the individual with Superman-like powers, there is still the issue of whether, should they be available, we have a responsibility to use these enhancements or be held responsible for our failure to enhance our offspring. This is of particular relevance when we inhabit a society that is committed to offer some kind of compensation for the inequalities in prospects caused by natural inequalities:

> *"…people who have the means to genetically enhance themselves or their offspring but chose not to might not be entitled to remediation. This may have special implications when these individuals compete with enhanced individuals for scarce resources."*[185]

As the above passage indicates, whether or not individuals have been enhanced may have an impact on how others behave towards them. Michael Sandel, in particular, highlights the risk of becoming a society where solidarity and tolerance towards other's shortcomings or imperfections is undermined. This would translate into a

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[183] Juengst, E. T. (1997). "Can Enhancement Be Distinguished from Prevention in Genetic Medicine?" *Journal of Medicine and Philosophy*, 22(2), 125-142.

[184] Vincent, N. (2014). "The ethics of personal enhancement, from beta blockers to ADHD drugs ". City.

[185] Mehlman, M. J. (1999). "Law of Above Averages: Leveling the New Genetic Enhancement Playing Field, The." *Iowa L. Rev.*, 85, 517-593. Page 547-548

decrease in compassion. The availability of enhancements "…would make it harder to foster the moral sentiments that social solidarity requires."[186] Although this concern is applied by Sandel to enhancements we choose for ourselves rather than our children, this lack of compassion could be extended to our genetically enhanced offspring. Since parents have decided not to enhance their children, it could be argued that society will deem the parents wholly responsible for the future of their offspring. If those future persons happen not to flourish in their chosen life plans, it will be their parents' fault. The rest of society may not feel that any reparation is due. This might create pressure on parents to increase the capacities of their children. Despite parents not being legally forced to choose enhancement technologies for their children, there might still exist a level of coercion, that might make their choice not entirely free. Michael Esposito[187] differentiates between the terms implicit and explicit coercion when discussing the ethical implications of the pharmacological enhancement of mood and cognitions. These concerns can also be extended to the germline modification of our future offspring. Implicit coercion would be present when, seeing that others are embracing these technologies, parents might feel compelled to enhance their children so that they are not disadvantaged when competing against their peers. Explicit coercion might also arise, for example, when posts and positions are only open for competition to those who have been genetically enhanced. In this case, the freedom not to enhance might be compromised even when governments do not apply any coercive eugenic policies.

This might also affect to what extent we are held legally and morally accountable for our actions. The possibility of our genes having a predominant role on our behaviour can have direct implications for the legal responsibility we are seen to have over the acts we have committed or failed to commit. On the one side, there can be a tendency for judges and juries to pass more lenient sentences based on a lesser degree of culpability caused by our biological make-up. Nowadays behavioural

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[186] Sandel, M. J. (2007). *The Case against Perfection: Ethics in the Age of Genetic Engineering*: The Belknap Press of Harvard University Press.

[187] Esposito, M. F. (2005). "Ethical implications of pharmacological enhancement of mood and cognition." *Penn Bioethics Journal*, 1(1), 1-4.

genetics can be offered as an explanation of how particular criminal behaviours can arise. Advances in genetics might make this kind of explanation more commonplace.

Conversely, some enhancements might enhance individuals in a way that they are better equipped to avoid their responsibilities. This is a concern relating to the implementation of cognitive enhancements in particular and highlighted by Mehlman.[188] Mehlman talks about the difficulties of actually determining who has or has not been enhanced. This is particularly pertinent to those choosing cognitive enhancements where the achieved increase in reasoning skills may not be easily recognised. Furthermore, it could be argued that those endowed with enhanced cognition would be better skilled at concealing the fact that they have been enhanced if this was a practice outlawed in society. They might be better than the rest of the population at not being caught for their crime and eluding punishment.

This section has shown how enhanced capacities might affect how our perceived level of responsibility for our actions is changed. With great enhancements seems to come great responsibility! A decreased level of solidarity and tolerance towards both the enhanced population and those parents who fail to enhance their children may lead way to coercion where none previously existed.

3.5 Conclusion

The ethical issues associated with germline genetic interventions are novel and complex. Novel because we are dealing with technologies that are not yet available. Complex, first, because the unfamiliarity with these technologies makes it difficult to identify which ethical issues may be relevant. Second, because we are dealing with technologies that do not have a direct effect on us but on future people. Speculating what is best for future people, adds an extra layer of complexity to an ethical enquiry. This additional complexity, for example is lacking from the evaluation of somatic genetic interventions which only affect the adult cells of individuals who are able to consent.

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[188] Mehlman, M. J. (1999). "Law of Above Averages: Leveling the New Genetic Enhancement Playing Field, The." *Iowa L. Rev.*, 85, 517-593. Page 568

The ethical concerns outlined in this chapter are likely to be the tip of the iceberg. A thorough examination demands to critically engage with each of the issues, an engagement that is outside the scope of this thesis. Nonetheless, an awareness of these ethical concerns is needed to help deliberate about the social justice issues which are the focus of this piece of work.

Chapter 4. Genetic cognitive enhancements and their role within the Rawlsian social justice theory

Having explored a variety of ethical concerns associated with the introduction of germline enhancements, my attention now turns to the main focus of this thesis, the implications that these interventions can have on issues of justice.

This chapter evaluates the potential genetic enhancement of the cognitive traits which form what has been previously been defined as General Fluid Intelligence (Gf). This concept encompasses the broad ability to reason and it involves solving "problems in unfamiliar domains using general reasoning methods."[189] Its applications to "unfamiliar surroundings" implies that we are dealing with a capacity that is naturally occurring in the individual as opposed to acquired through external conditioning or learning. The individual components of Gf include capacities such as **inductive and deductive reasoning**, **information processing** and **problem solving skills**. The permissibility of their genetic enhancement will be assessed against the backdrop of liberal egalitarian thought. Henceforth, I will use the terms General fluid intelligence and reasoning capacities interchangeably.

My focus resides in the Rawlsian theory of justice. I argue that this conception of political justice provides a positive argument for the permissibility of these interventions. I do this by exploring how Rawls's political theory can and should be extended to include genetic cognitive enhancements as social primary goods.

Recent liberal egalitarian theories have considered natural talents and social contingencies as morally irrelevant despite their considerable impact on the level of opportunities available to citizens. Contemporary liberal political theory provides us with different versions of the meaning of egalitarianism. We could aim to achieve equality of welfare, wellbeing, resources, or opportunity with each approach having different implications for how we ought to deal with the implementation of genetic enhancements and their distribution. All, however, share the idea that inequalities caused by morally arbitrary factors need to be eliminated or, at the very least,

[189] Kyllonen, P., and Kell, H. (2017). "What Is Fluid Intelligence? Can It Be Improved?", *Cognitive Abilities and Educational Outcomes*. Springer, pp. 15-37. Page 15

minimised. Rawls's concern with inequalities also originates from the moral arbitrariness of natural and social contingencies. However, his political conception was particularly ground-breaking for the role assigned to social institutions in protecting the moral worth of individuals.[190] A society whose basic institutions govern the distribution of benefits of social cooperation between citizens according to their level of natural talents or skills, Rawls believes, fails to treat the individuals as moral equals and to give them the moral worth they deserve.

Rawls's political theory provides the theoretical framework in this thesis to discuss the impact of genetic interventions in social justice. I chose Rawls because of his dedication to addressing the unequal distribution of opportunities and other socio-economic goods caused by unequal distributions of natural talents. Since these traits are considered to be arbitrary from a moral perspective, justice needs to be concerned with their impact on the individual's life prospects or opportunities. It is the impact of these morally arbitrary factors that motivated Rawls in his development of fair principles of social cooperation. Rawls's objective is to stipulate principles of justice that promote equality, a type of equality anchored in the idea that society must treat everyone as free and equal moral agents whose burdens and benefits when engaged in social cooperation are not influenced by factors such as natural talents, social standing, race, or gender.[191] Failing to implement principles that aim to address the inequalities caused by morally arbitrary factors is failing to treat citizens equally.

The chapter begins with an exposition of the development of the Rawlsian political conception of justice as fairness. As part of this account, I provide a definition of primary goods and of the principles governing their distribution.

Having acquired a suitable understanding of Rawls's political conception I then begin to explore how genetic cognitive enhancements can be incorporated into the

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[190] The overriding value that Rawls gives to people over other considerations on matters of justice is made clear by Rawls on the very first page of *A Theory of Justice* "Each person possesses an inviolability founded on justice that even the welfare of society as a whole cannot override" Rawls, J. (1971). A theory of justice: Belknap Press. Page 3

[191] Ibid. Page 7

Rawlsian theory and become part of his political conception. This section, in particular, evaluates whether genetic cognitive enhancements meet the necessary requirements to be counted as primary goods fulfilling their role as all-purpose goods and as components in the development of the person as a moral agent.

I conclude the chapter showing that Rawls's political conception is able to accommodate these newly emerging technologies as they meet the conditions required of social primary goods.

4.1 Rawlsian egalitarian thought, a philosophical liberal framework to mitigate the effects of morally arbitrary factors on people's opportunities.

Liberal egalitarian theories of justice have traditionally defended the idea that there is a duty to neutralise or minimise the socio-economic inequalities caused by morally arbitrary factors.[192] Despite having no control over them, these factors can have considerable impact on the course of our lives. This has prompted liberal egalitarian theories to focus on the effects that consideration of race, gender, social class and natural talents have on the individual's lot in life. It is the concern of justice, they claim, to address the effects caused by these morally arbitrary factors.

Within this liberal thought, I rely on the political theory developed by John Rawls. His emphasis on the influence that morally arbitrary factors have on the individuals' life prospects provides an ideal starting point and framework for the development of my arguments. The idea of moral arbitrariness of natural and social contingencies is defined by Rawls in opposition to what is generally considered as morally deserved:

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[192]Authors such as Dworkin, Cohen and Roemer provide different versions of luck egalitarianism supported by the idea that outcomes derived by factors outside the individual's control require compensation. Sen's capabilities approach was developed in response to Rawlsian egalitarianism. All these egalitarian theories aim to address the effects that morally arbitrary contingencies have on people's lives.

Dworkin, R. (2002). *Sovereign Virtue: The Theory and Practice of Equality*: Harvard University Press

Roemer, J. E. (1993). "A pragmatic theory of responsibility for the egalitarian planner." *Philosophy & Public Affairs*, 146-166.

Cohen, G. A. (1989). "On the currency of egalitarian justice." *Ethics*, 906-944.

Sen, A. (1980). "Equality of what?". City: Stanford University, pp. 26.

> *"moral desert always involves some conscientious effort of will, or something intentionally or willingly done, none of which can apply to our place in the distribution of natural endowments, or to our social class of origin."*[193]

From the onset, in *A Theory of Justice*, Rawls makes clear his rejection of inequalities caused by these social and natural contingencies:

> *"Not only they are pervasive, but they affect men's initial chances in life; yet they cannot possibly be justified by an appeal to the notions of merit and desert. It is these inequalities, presumably inevitable in the basic structure of any society, to which the principles of social justice apply."*[194]

Mitigating the influence that these social and natural contingencies have on the opportunities and distribution of all-purpose goods over the individual's life becomes the focus of the development of his political theory. His will be a conception of justice that "nullifies the accidents of natural endowment and the conditions of social circumstance as counters in quest for economic and political advantage."[195]

Rawls's concern with inequality as the motivating force for proposing an egalitarian system aimed at tackling these inequalities permeates his work from *A Theory of Justice* to the final statement of his political conception in the revised edition of *Political Liberalism*. Throughout his work, his account of justice maintains the same focus:

> *"What the theory of justice must regulate is the inequalities in life prospects between citizens that arise from social starting positions, natural advantages and historical contingencies."*[196]

Underpinning Rawls's goal to regulate these inequalities is the intuitive idea that, since natural talents and social and economic contingencies are undeserved, the benefits and burdens derived from them are also undeserved. Rawls proposes a

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[193] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 74 (n)

[194] Rawls, J. (1971). A theory of justice: Belknap Press. Page 7

[195] Ibid. Page 15.

[196] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 271

political conception that he believes to be in line with the widely held moral intuitions, implicit in the culture of modern democratic societies:

> "…it seems to be one of the fixed points of our considered judgements that no-one deserves his place in the distribution of native endowments, any more than one deserves one's starting place in society"[197]

These considered judgements, Rawls believes, are deeply held intuitions that present themselves clearly and without distortion to the individual.[198] They lead us to consider, for example, that violations of people's liberties and discrimination or persecution based on gender, religion and race as inherently unjust. His theory of justice, therefore, has a very clear set of assumptions anchored in moral intuitions that are assumed to exist in most modern democracies. Rawls takes these convictions to be embedded within our political culture and any proposed principles of justice must be able to capture them:

> *"We collect such settled convictions as the belief in religious toleration and the rejection of slavery and try to organise the basic ideas and principles implicit in these convictions into a coherent political conception of justice. These convictions are provisionally fixed points that it seems any reasonable conception must account for"*[199]

Importantly, amongst this set of convictions is that we care about how different levels of natural talents impact people's chances in successfully pursuing their life plan. Rawls takes heed of this concern and argues that natural capacities such as intelligence, as well as social contingencies, such as wealth and opportunities affect how successfully individuals are able to pursue their chosen goals:

> *"Greater intelligence, wealth and opportunity, for example, allow a person to achieve ends he could not rationally contemplate otherwise."*[200]

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[197] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 104

[198] Ibid. Page 47-48

[199] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 8

[200] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 93

Furthermore, the historic distributions of natural capacities and the morally arbitrary rewards attached to them have had a cumulative effect on the allocation of social and economic advantages and disadvantages, perpetuating inequalities across generations. Similarly, access to positions of power and status is in part influenced by the cumulative effects of prior distributions of natural talents and abilities and the degree to which these have been realised.[201]

Rawls believes that these are all powerful reasons to consider how a conception of justice can best address the unequal prospects caused by different natural talents. It is his commitment to addressing these inequalities that incites me to explore whether and how he is concerned about the cognitive capacities of individuals. The following section explores the role that native cognitive abilities played in his theory and whether that role can be extended.

4.2 The effect of cognitive capacities on life prospects and the Rawlsian account of fair equality of opportunity.

The relevance of cognitive capacities for the Rawlsian theory of justice resides in their ability to affect the opportunities available to individuals. Since equalising opportunities is at the heart of the Rawlsian theory of justice, it is worthwhile to explore how these abilities features in his writings.

Before starting my enquiry, however, it is important to explore how Rawls uses the concept of opportunity. Rawls's understanding of opportunity throughout his works may often appear to be confusing. Rawls's terminology varies when he refers to the effects caused by these differentials in natural talents. He often talks about the achievement of "ends" and also regularly discusses how natural and social factors affect the access to "opportunities" and "positions of authority and responsibility"[202], "cultural knowledge and skills"[203] or "access to education"[204], "prospect of

[201] Ibid. Page 72

[202] Ibid. Page 61

[203] Ibid. Page 73

[204] Ibid. Page 275

success",[205] and finally the range of "life chances" or "life prospects"[206] available to all. What these terms seem to share is how they all relate to the effect these contingencies have on people's lives, in particular, how successful individuals might be in realising their aims and goals in life.

Rawls uses these terms often interchangeably when arguing in favour of the principles of justice. It is for this reason, and for simplicity's sake that I will be broadly using "opportunity" to encompass all these different terms. In doing this I draw inspiration from other Rawlsian inspired authors like Richard Arneson who defines opportunity as "a chance of getting a good if one seeks it";[207] and Norman Daniels's similar understanding that a range of opportunity comprises an "array of life plans".[208]

Bringing the discussion back to cognitive capacities, let us recall how Chapter 2 outlined the evidence surrounding the genetic component of cognitive abilities and the future prospects of modifying these capacities by intervening in the genome. I concluded that these capacities are not only dependent on social and environmental factors but that they also have a strong genetic component which enables us to treat them, at least in part, as natural talents.

Their conceptualisation as natural talents leads me to consider whether Rawls would be concerned with their effect on the individual's life prospects. Upon reflecting about natural attributes, Rawls includes health, intelligence, vigour and imagination as natural attributes that are particularly valuable from a justice perspective.[209] These traits were used as examples of the type of natural capacities, also referred to as natural primary goods,[210] that affect the opportunities or life

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[205] Ibid. Page 73

[206] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Pages 270-271

[207] Arneson, R. (1989). "Equality and equal opportunity for welfare." *Philosophical Studies*, 56(1), 77-93. Page 83

[208] Daniels, N. (2003). "Democratic equality: Rawls's complex egalitarianism." *The Cambridge Companion to Rawls*, 241, 76. Page 257

[209] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 62

[210] Later own in this chapter I provide a full account of Rawlsian primary goods. These are divided into natural primary goods and social primary goods.

chances open to individuals and the subsequent acquisition of socio-economic resources needed to pursue their goals.

It is because of the special role that natural capacities have that, according to Rawls '…it is also in the interest of each to have greater natural assets. This enables him to pursue a preferred life plan.'[211]

Having different levels of cognitive capacities also impacts the successful pursuit of our goals in a way that should awaken the curiosity of any Rawlsian theorist. These genetic traits are, at least for now, beyond our control and are known to affect the range of different jobs and positions individuals are realistically able to access. For example, succeeding academically depends in part on the natural capacity we have for synthesizing and processing information, our reasoning skills and our ability for critical appraisal. This educational success is then likely to lead to better job opportunities, potentially yielding higher returns in the acquisition of socio-economic goods.[212] Recent research also suggests that there is a relationship between IQ scores[213] and average income. These findings, based on US data, indicate that the difference in income between someone with an IQ in the normal range and someone in the top 2% can range from $6,000 to $18,500 per year.[214] Other studies have also reported an association between IQ, educational achievement and income, with part of this association shown to be mediated by genetic factors.[215]

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[211] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 108

[212] It is worth noting that these cognitive capacities will not only yield benefits in pursuing careers requiring a particular set of educational achievements. The improvement of reasoning capacities such as inductive and deductive reasoning, information processing and problem solving skills will also improve our chances of success in most chosen life plans. This point is further developed later on in this chapter

[213] Intelligence measures vary and are often considered controversial. The general intelligence measure used for this particular research consists of ten tests; general science, arithmetic reasoning, word knowledge, paragraph comprehension, numerical operations, coding speed, auto and shop information, math knowledge, mechanical,comprehension, and electronics knowledge. The general fluid intelligence (Gf) components, which are the focus of this enquiry, have long been incorporated in the measurement of IQ, therefore the correlation noted between IQ and income could be assumed to have been influenced by the capacities analysed in this chapter.

[214] Zagorsky, J. L. (2007). "Do you have to be smart to be rich? The impact of IQ on wealth, income and financial distress." *Intelligence*, 35(5), 489-501.

[215] Rowe, D. C., Vesterdal, W. J., and Rodgers, J. L. (1998). "Herrnstein's syllogism: Genetic and shared environmental influences on IQ, education, and income." Ibid., 26(4), 405-423.

These empirical findings show a relationship between our cognitive capacities and our ability to access economic goods and opportunities. The effect that cognitive capacities have on access to opportunities and socio-economic goods means that we are required, from a Rawlsian perspective, to regulate the inequalities caused by their unequal distribution.

The similarities between these cognitive capacities and the natural talents initially considered by Rawls further supports the hypothesis that they should count as the kind of contingency that Rawls would have considered relevant for inclusion within his framework.

4.2.1 Addressing inequalities caused by differentials in cognitive capacities from a Rawlsian perspective. The move from formal equality of opportunity to fair equality of opportunity.

Having recognised the impact that variations in genetic cognitive talents can have on people's life prospects and their ability to secure socio-economic goods this section provides a detailed account of the value of opportunity in Rawlsian theory. Rawls concludes that his account of fair equality of opportunity provides a way to deal with inequalities arising from social contingencies. However, addressing inequalities emerging from natural contingencies, he claims, requires additional measures to regulate the benefits emanating from these inequalities.

The value that Rawls gives to opportunity is central to the development of his theory of justice. He dedicates one of his principles to protecting what he defines as fair equality of opportunity. In *A Theory of Justice* Rawls takes the reader through a fairly arduous path that eventually leads to his principles. He labels each of the stages taking him to the fuller conception of fair equality of opportunity as: natural liberty, liberal equality and democratic equality respectively.

Rawls begins his analysis by bringing to our attention a social arrangement, that he defines as the system of **natural liberty,** where careers are open to talents. Under this arrangement individuals are judged for jobs and offices purely on the set of skills and abilities they possess. Everyone has the right to access any position they desire free of any governmental restrictions based on factors such as caste, religion, gender, or sexual orientation. These morally arbitrary factors are ignored and

institutions are arranged so that there are no legal barriers for people when competing for positions that will enable them to acquire socio-economic shares. Beyond this, there are no other governmental measures to address the effects of these contingencies. This kind of arrangement is commonly known as formal equality of opportunity. The implication of a system embracing a purely formal equality of opportunity where careers are open to talents without any further modifications or adjustments is that the distribution of income and wealth depends on our natural talents, abilities, personal qualities such as motivation, ambition, luck and, finally, the social context in which we may or may not be able to realise our plans.

Even though this lack of governmental intervention in the regulation of access to opportunities seems to be desirable since it preserves the individual's freedom to access positions, Rawls highlights how any resulting distributions in wealth and income will still be affected by social contingencies. In view of this, Rawls regards the elimination of legal barriers in access to positions as insufficient. The system of natural liberty does not guarantee fairness since the resulting distribution of opportunities and economic assets is still influenced by "morally arbitrary" factors such as luck and the familial and social background in which we are born. Justice will also need to concern itself with dealing with these inequalities; the lack of commitment in the system of natural liberty to avoid outcomes caused by morally arbitrary factors leads Rawls to pursue a more substantive principle of opportunity.

Rectifying the effects of morally arbitrary factors, Rawls argues, must be the focus of a principle designed to protect equality of opportunity. This was Rawls's objective when he described the system of **liberal equality** where fair equality of opportunity goes beyond formal equality of opportunity by ensuring that those with equal talents and motivations have an equal opportunity to access positions that confer economic, social or political advantages. Fair equality of opportunity, according to Rawls, can only be achieved when those with equal abilities and motivations are able to access positions open in a formal sense and, most importantly, also have a fair chance to attain them. Rawls here makes the move towards a system where fair equality of opportunity is maintained through the elimination of the influence of social contingencies:

> *"The thought here is that positions are to be not only open in a formal sense, but that all should have a fair chance to attain them. Offhand it is not clear what is meant, but we might say that those with similar abilities and skills should have similar life chances. More specifically, assuming that there is a distribution of natural assets, those who are at the same level of talent and ability, and have the same willingness to use them, should have the same prospects of success regardless of their initial place in the social system, that is, irrespective of the income class into which they are born. In all sectors of society there should be roughly equal prospects of culture and achievement for everyone similarly motivated and endowed. The expectations of those with the same abilities and aspirations should not be affected by their social class."*[216]

This stronger view of equal opportunity attempts to mitigate the unfair outcomes generated by a system of natural liberty by trying to eliminate the effects of arbitrary social contingencies. The socio-economic class of the individuals should not influence the prospects and life chances available to those similarly motivated and endowed. Political institutions, Rawls argues, should aim to correct the morally arbitrary social contingencies affecting equality of opportunity through the implementation of inclusive policies such as universal access to education. However, there is a recognition that universal education alone will not eliminate the inequalities caused by morally arbitrary factors. Rather, it will often help to entrench them, with the quality of education often widely affected by regional segregation and poorly diffused political power.[217] The introduction of early intervention educational programmes such as Head Start in the US and Sure Start in the UK is seen as outreach tools designed to complement the role of universal education with a goal to give children under 5 years of age their best start in life and to improve their life prospects as adults.[218] These programmes incorporate non educational measures such as the provision of healthcare and nutritional advice and

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[216] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 63

[217] Daniels, N. (2003). "Democratic equality: Rawls's complex egalitarianism." *The Cambridge Companion to Rawls*, 241, 76. Page 250

[218] More detailed information about Head Start and Sure start can be found on https://eclkc.ohs.acf.hhs.gov/hslc/hs/about and https://www.gov.uk/government/publications/sure-start-childrens-centres

tools to empower parents to foster the child's developments. The success of these programmes is regularly monitored and the jury is still out on both their cost effectiveness and their long term impact on the child's development.[219]

Notwithstanding the improvements incorporated into the equality of opportunity account, it still fails to address the inequalities in socio-economic goods caused by the different distributions of natural assets. Even though Rawls believes that "there is no more reason to permit the distribution of income and wealth to be settled by the distribution of natural assets than by historical and social fortune",[220] it seems that leaving equality of opportunity as defined above allows too much room for the influence of arbitrary factors. Rawls needs to develop a stronger principle that removes or minimises the effects caused by our biological make-up.

4.2.2 The Rawlsian move towards a more genuinely fair equality of opportunity: the system of democratic equality.

In a move to address the arbitrary effects of the natural lottery, Rawls puts forward the final piece of the jigsaw in his delivery of true fair equality of opportunity and moves on to describe a system of **democratic equality.** The idea that we should deal with the effects of the natural lottery is emphasised by Rawls when he claims that to treat people equally one must provide them with genuine equality of opportunity.[221] If differences in natural talents adversely affect the range of life plans available to citizens, it cannot be claimed that genuine equality of opportunity exists.[222] Providing genuine equality of opportunity means for society to provide more attention to those with fewer natural talents and those born into less favourable positions.

How we deal with the inequalities caused by natural talents, Rawls believes, is however, strongly influenced by their non-distributable nature. While Rawls did not

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[219] Health, U. D. o., and Services, H. (2010). "Head Start Impact Study: Final report, executive summary." *Washington, DC: Administrations for Children and Families. Retrieved January*, 18, 2012.

Melhuish, E., Belsky, J., Leyland, A. H., Anning, A., Hall, D., Tunstill, J., Ball, M., Meadows, P., Barnes, J., and Frost, M. (2010). "The impact of Sure Start local programmes on 5-year-olds and their families."

[220] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 74

[221] Ibid. Page 100

[222] Ibid. Pages 65 to 75

consider this option, we can now imagine how directly intervening in the genome might alter those natural capacities.

Rawls's argument develops from the assumption that even though individuals are entitled to their natural capacities and to develop them as they choose, they are not however entitled to any claim that social institutions should reward them for their exercise. Conversely, the distribution of talents and skills are deemed to be a common asset and citizens are to share in the benefits derived from their distribution. This approach would eliminate the need to genetically alter these natural capacities seeking some sort of genetic equality. [223]

The distribution of natural capacities, or their inequalities among people, are understood as part of the common asset yielding benefits to be shared amongst citizens. Differences in their distribution, according to Rawls, are not to be eliminated. Rawls instead, proposes a mechanism whereby citizens will share the benefits conferred by different allocations of natural talents. More specifically, Rawls's goal is to regulate this benefit sharing scheme through the adoption of "a principle which mitigates the arbitrary effects of the natural lottery itself."[224]

4.3 The re-distribution of socio-economic goods as the chosen Rawlsian mechanism for dealing with inequalities in genetic cognitive capacities.

Understanding how this benefit sharing system works, requires first a brief inquiry into the characteristics of the goods that Rawls is seeking to re-distribute. Second, the principles that regulate their distribution need to be outlined as well as how they relate to one another. It is only then that we will be in a position to understand how we can potentially deal with the inequalities originating from differences in cognitive capacities.

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[223] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 100

[224] Ibid. Page 74

4.3.1 A brief introduction to Rawlsian primary goods and the influence of the basic structure of society on their allocation:

The socio-economic goods that are regulated by the principles of justice are called social primary goods. In his account of primary goods Rawls differentiates between social and natural primary goods. Natural primary goods include capacities such as intelligence, health and vigour. However, natural primary goods are not the subject of distributive justice. His principles of justice only deal with the distribution of social primary goods. Henceforth, when I refer to primary goods these will be assumed to be social primary goods unless specified otherwise.

Social primary goods are broadly defined by Rawls as basic rights and liberties, the freedom to pursue opportunities, power and authority, income, wealth, basic healthcare, leisure time[225], and the social bases of self-respect. Rawls's definition of primary goods and of the role they fulfil within his political conception varies throughout his works. In *A Theory of Justice* primary goods[226] are defined as those things that everyone should rationally want, regardless of their conception of the good. The concept of primary goods is then developed further in his later writings at which point Rawls included basic healthcare and leisure time[227] and certain public goods contributing to health, such as clean air and unpolluted water.[228]

Additionally, primary goods are not simply goods that it is rational to desire because of their value in our pursuit of our determinate conceptions of the good.[229] Most importantly, they also enable citizens to become fully cooperating members of society through the development of their two moral powers.[230] The citizen's moral powers are defined by Rawls as a sense of justice and a capacity for a conception of the good. Each are closely associated with the capacities for reasonableness and rationality.

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[225] Rawls original definition of primary goods in a 'A Theory of Justice' excluded basic healthcare and leisure time. These were only added in 'Justice as fairness' Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Pages 171-179

[226] Rawls, J. (1971). *A theory of justice*: Belknap Press.

[227] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Pages 179-180

[228] Ibid. Page 172

[229] Ibid. Page 88

[230] Ibid. Page 19 and 58

Having these powers to a minimum degree will enable the individual to fully engage in social cooperation and to take part in society over a complete life. In short, primary goods are meant to fulfil the higher order interests that Rawls assumes all citizens have. These are higher order interest in the sense that they are prior to other interests citizens might have and pursuing them becomes regulative of the individual's conduct insofar as "whenever circumstances are relevant to their fulfilment, these interests govern deliberation and conduct."[231]

Despite the different definitions of primary goods given by Rawls, one aspect of his theory that remains constant is that the justice of a given society depends on the principles chosen to regulate the distribution of social primary goods. These principles will govern the basic structure of society rather than directly interfere in the particular moral behaviours of the individuals. The role of the basic institutions is key in determining the conditions of social cooperation of a given society. Furthermore, through this regulation they strongly, albeit indirectly, influence the moral conduct and attitudes of individuals through their promotion or discouragement.[232] It is therefore expected that just institutions will also serve to promote the just behaviour of individuals in their day to day social cooperation with one another and in their role as citizens.

In his article 'The Basic Structure as Subject' Rawls clarifies his definition of this basic structure:

> *"(It is) the way in which the major social institutions fit together into one system of social cooperation, and how they assign fundamental rights and shape the division of advantages that arises through social cooperation. Thus the political constitution, the legally recognised forms of property, and the organisation of the economy, all belong to the basic structure"*[233]

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[231] Rawls, J. (1980). "Kantian constructivism in moral theory." *The journal of philosophy*, 515-572. Page 525

[232] Pogge, T. W. M. (1989). *Realizing rawls*: Cornell University Press. Page 33

[233] Rawls, J. (1977). "The Basic Structure as Subject." *American Philosophical Quarterly*, 14(2), 159-165. Page 159

This basic structure therefore becomes the primary subject of justice for Rawls because of the potentially pervasive effect and impact that it has on our ambitions, chosen life plan and the kind of persons we eventually become:

> *"The intuitive notion here is that this structure contains various social positions and that men born into different positions have different expectations of life determined, in part, by the political system as well as by economic and social circumstances. In this way, the institutions of society favour certain starting places over others. These are specially deep inequalities."*[234]

The statement above explains two things. First, our expectations are shaped in part by our starting positions in society. Second, social institutions play a key role in determining whether our natural talents and abilities are realised either through perpetuating the inequalities that stop us from achieving our goals or by providing the mechanisms needed to minimise these inequalities.

Since these deep inequalities mentioned by Rawls are rooted within the basic structure, we need to be able to secure what Rawls calls "background justice", that is, the just conditions needed to obtain within these institutions. Securing these background conditions will be achieved through the development of principles of justice that regulate the distribution of the primary goods that the basic structure influences so strongly:

> *"liberties and powers are defined by the rules of major institutions and the distribution of income and wealth is regulated by them."*[235]

Rawls's objective is to define the principles of justice that govern the basic structure. These principles will assign basic rights and liberties, grant equality of opportunity and regulate the distribution of economic and social benefits such as wealth and income. Their role is to eliminate, or at least to minimise, any potential inequalities originating from within the basic structure of society and their effect on the range of opportunities available to all.

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[234] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 7

[235] Ibid. Page 92

Rawls believes that the regulation of the basic structure will be fair when it is regulated according to two distinct principles of justice. What follows is a brief summary of how social primary goods are distributed under the principles governing the basic structure.

4.3.2 The protection of basic rights, liberties, opportunity, and the distribution of socio-economic goods under the Rawlsian principles of justice:

Basic rights and liberties are the primary goods that need to be equally distributed and that should not be subject to any trade-offs under the Rawlsian scheme. The principle protecting these goods is known as the **principle of equal liberty** and, under its final formulation in *Political Liberalism*, it guarantees that everyone is entitled to an equal scheme of citizens' basic rights and liberties independently of the position the individual might hold in a given society:

> *"Each person is to have an equal right to a fully adequate scheme of basic liberties which is compatible with a similar scheme of liberties for others."*[236]

Although the list of rights and liberties under that scheme is kept fairly vague throughout Rawls's writings, clarification is provided in *Political Liberalism,* where Rawls includes the following:

> *"freedom of thought and liberty of conscience; the political liberties*[237] *and freedom of association, as well as the freedoms specified by the liberty and integrity of the person; and finally, the rights and liberties covered by the rule of law."* [238]

Once equal basic liberties are guaranteed for every individual, Rawls's aim is to ensure fair equality of opportunity and to set the criteria for allowable inequalities in the distribution of economic goods at the level of the basic structure. This is encapsulated under Rawls's second principle of justice which is itself split into two

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[236] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 5

[237] Political liberties are not further defined in 'Political Liberalism, however, Rawls extensively defends political participation and particularly defines political liberty in 'A Theory of Justice' as '*the right to vote and to be eligible for public office*'

Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 61

[238] Rawls, J. (1993). *Political liberalism*: Columbia University Press. Page 291

distinct parts. Under this principle social and economic inequalities are only allowed if a) these inequalities are arranged so that they are to the benefit of the least advantaged in society.[239] and b) they are attached to positions open to all under conditions of fair equality of opportunity. The first part of the principle is known as the **difference principle** and the second part is referred to as the **principle of fair equality of opportunity**.

In summary, Rawls proposes principles of justice that regulate the social primary goods as follows: the first principle of justice guarantees the equal distribution of basic rights and liberties; the principle of fair equality of opportunity guarantees fair access to offices and positions of power to those with similar talents and ambitions; and finally, the difference principle, starting from a default position of equality in the distribution of economic goods, only allows departures from this status of equality when they benefit the worst off in society. In essence, the role of the difference principle is to regulate the socio-economic inequalities caused by the fact that individuals, despite the conditions set by the fair equality of opportunity (FEO) principle, do not have access to the same opportunities due to their different levels of natural talents.

The introduction of the difference principle is Rawls's way to address the failures of the FEO principle in dealing with the outcomes of differentials in natural talents. This formulation of the difference principle is rooted not in the belief that the distribution of natural talents is unjust but rather that the outcomes resulting from that distribution are undeserved. The difference principle expresses the responsibility citizens have in sharing in the profits and burdens resulting from different distributions in natural assets.

Regulating inequalities in socio-economic goods in a way that they maximally benefit the worst off requires first, the identification of this worst off group and, second, the availability of a measure to make comparisons in the allocations of these goods. Rawls is aware that he needs to develop some kind of tool to be able to make

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[239] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 42. I have explained how the difference principle allows inequalities which are to the benefit of all giving priority to the least advantaged. It is important to note here that Rawls will frequently only use "to the benefit of the least advantaged" as shorthand with the understanding that it also includes to the benefit of all.

these comparisons. This comes in the form of an index of primary goods that enables him to make interpersonal comparisons of resource allocation and identify the worst off representative individual.

The inclusion of social primary goods in this index is stipulated as follows: basic rights and liberties and fair equality of opportunity are assumed to be equally distributed amongst citizens.[240] As per the principles of justice dictate, these social primary goods ought to be always equal leaving the rest (the powers and prerogatives of authority, income and wealth) open for distribution. Believing that the powers and prerogatives coming from occupying positions of authority are strongly correlated with income and wealth, Rawls concludes that using these economic goods as proxies to evaluate how the lifetime expectations of individuals fare, provides an accurate enough measure. In other words, those individuals with the least income and wealth are likely to have fewer positions of power in society, and vice versa. Rawls claims that we can safely assume the following:

> *"those with greater political authority, say, or those higher in institutional forms, are in general better off in other respects."*[241]

Interpersonal comparisons in the allocation of primary goods are then simplified by only using the shares of income and wealth as a proxy[242]. This being the case, when it comes to identifying the least advantaged individual, Rawls chooses the

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[240] Rawls's principles of justice did not consider how we would treat the distribution of leisure time or basic healthcare. However, he acknowledged that leisure time could be added to a metric that helped us to identify the worst off in society since "unforced" leisure time had a value in people's welfare. Additionally, he indicated that citizens would have a right to receive a level of basic healthcare that would enable them to continue functioning as fully cooperating members of society. Rawls does not propose a principle that would regulate the distribution of the social bases of self-respect. However, his writings suggest that the two principles of justice that he proposed are themselves designed in such a way that they provide citizens with the required self-respect understood as a "secure sense of their own value" and "lively sense of worth". See Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Pages 59 and 60 and Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 318

[241] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 97

[242] Norman Daniels has criticized whether income can really be considered a good proxy for other primary goods. In a situation where greater worker control is granted in organisations, we can imagine that a loss of productivity might follow, however these changes in working conditions can work towards improving the social bases of self-respect which, according to Rawls, is the most important primary good. All in all we could have a situation where income decreases but the increase in self-respect compensates for any losses in wealth. Daniels, N. (2003). "Democratic equality: Rawls's complex egalitarianism." *The Cambridge Companion to Rawls*, 241, 76. Page 262

representative group that, whilst still receiving an equal share of basic liberties and fair access to opportunities, has the least authority and lowest income; in other words, those belonging to the "income class with the lowest expectations."[243]

Rawls's political conception now is equipped with principles of justice that are egalitarian and reciprocal in nature. They are egalitarian in the protection that they afford to basic rights, liberties and access to opportunities. They are reciprocal in the way that those most talented and benefitting from social cooperation, give back through sharing in the benefits resulting from their superior talents. The reference point for these distributional demands is the least advantaged representative group in society.

Now that we have an understanding of the basic workings of the Rawlsian distributive principles of justice as well as of the kinds of goods that they distribute, we are in a better position to explore how Rawls might deal with the inequalities arising from different cognitive talents.

4.3.3 Dealing with inequalities caused by different distributions of genetic cognitive capacities under the Rawlsian framework:

Applying the Rawlsian theory of justice to genetic cognitive talents seems to imply that attempts to address inequalities in socio-economic goods caused by disparities in their distribution will be the remit of the difference principle.

Within a strictly unmodified Rawlsian framework this involves the redistribution of income and wealth, leaving the natural capacities of individuals unchanged. However, the focus that Rawls gives to income and wealth by appealing to their re-distributable and measurable character may not be the only alternative in a world where scientific advances have made the modification of natural capacities a clear possibility.

Recent scientific technologies offer Rawls the possibility of modifying the list of redistributable primary goods. Having the scientific means to alter cognition means that these technologies themselves have the potential to become a special kind of primary good, a primary good that changes our natural capacity for cognition. This

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[243] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Pages 42-43

new primary good will be defined as all those genetic cognitive enhancements designed to augment our reasoning capacities or general fluid intelligence.

4.4 Can genetic cognitive enhancements meet the conditions required of social primary goods?

Throughout his writings, Rawls regards primary goods as those natural and socio-economic goods found valuable in the citizen's development of their two moral powers and in the successful pursuit of their conception of the good.

First, it is worthwhile to briefly recapitulate and summarise the Rawlsian primary goods and the principles of justice that apply to each category:[244]

Table 1: The regulation of primary goods by the Rawlsian principles of justice:

Social Primary Good	**Principle of Justice**
Basic rights and liberties	1st Principle of justice
Opportunities (Freedom of movement and free choice of occupation against a background of diverse opportunities)	2nd part of 2nd Principle of justice (FEO)
Powers and prerogatives of offices and positions of authority and responsibility	1st part of 2nd principle of justice (difference principle). Regulated via the re-distribution of income and wealth

[244] Leisure time and basic healthcare are excluded from this breakdown since Rawls was never explicit as to what principles would apply to their distribution. In his later writings Rawls left open the possibility of leisure time being included in the index of primary goods for the purpose of interpersonal comparisons whilst he believed that basic healthcare should be secured for all citizens equally

Income and wealth (also used as proxy for powers, offices and positions)	1st part of 2nd principle of justice (difference principle)
Social bases of self-respect	Regulated by the correct functioning of basic institutions according to the principles of justice

How each of these goods is regulated within the basic structure is determined by the role that each has as either all-purpose goods in pursuing the citizens' life plans or in the development of their moral powers. In this section I define each of these roles and evaluate whether genetic cognitive enhancements can be considered as suitable candidates to deliver them.

4.4.1 Primary goods as necessary for the successful pursuit of a conception of the good.

The premise I defend in this section is that the genetic cognitive enhancements I evaluate can be classed as all-purpose goods that enable citizens to advance their conception of the good which comprises a specific set of final ends and aspirations.[245] Being able to advance and be successful in the pursuit of our goals and aspirations is, as previously mentioned, a higher order interest of all citizens and the role of the principles of justice is to ensure that the distribution of primary goods is such that this higher order interest is met.

Since Rawls's political conception is not committed to any comprehensive world view, primary goods will need to be valuable across most life plans developed within the permissible or reasonable comprehensive doctrines held by the individual.[246] Rawls views the just society as comprising a wide range of diverse, and often opposing, conceptions of the good that will be considered reasonable in so far as

[245] Rawls, J. (1999a). *Collected papers*. Page 365

[246] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 408-409

they fit within the well-ordered society and are compatible with the principles of justice. The well-ordered society is defined by Rawls as one inhabited by citizens that publicly accept, agree and act upon the principles of justice[247] Since primary goods are not designed to serve all conceptions of the good, only reasonable ones, I will refer to this requirement as the **near-universality criterion**.

The lack of commitment to a particular comprehensive doctrine also requires that no particular view is either intentionally promoted nor discriminated by the political conception of justice. Simply put, this is intimately related to the near-universality character of primary goods insofar as the choice of goods is not meant to favour any particular comprehensive doctrine. By adhering to the near-universality condition, our choice of primary goods will, by default, also fulfil the **neutrality criterion** needed for the acceptability of the political conception.

4.4.1.1 Meeting the near-universality criterion

Focusing on our reasoning capacities, and the near-universality criterion, the proposed genetic technologies will equip citizens with additional tools to enable them to further their chosen plans and goals. These improvements to their cognitive capacities will be valuable whether their chosen path is of an intellectual, manual, aesthetic or religious nature. An astute critic can argue that these traits are only desirable in today's modern western society. Their value may be questionable in other cultures more distant from western democratic societies such as the African Dassanech tribe where night-time crocodile hunting is essential in order to survive. For the Dassanechs, the most valued capacities are likely to be skills such as quick response reactions, strength, speed, better than average eyesight and, above all, courage! These will doubtless be very valued traits in a successful crocodile hunter, nevertheless, enhanced cognitive skills will contribute towards the success of the hunt. For example, better reasoning capacities may improve the tactics employed to identify the best places and timing for the hunt and the planning of their hunting techniques to enable them to "outwit" the crocodile and ultimately take the upper hand. Although this example is extreme and it helps to emphasize the usefulness of

[247] Ibid. Pages 453-462

these cognitive enhancements as primary goods, it is important to remind ourselves of the limited scope that Rawls envisaged for his theory of justice. The domain of his theory is that of "democratic societies under modern conditions"[248] where pure hunter-gatherer subgroups of the population might not be found easily.

Modern democracies will however encompass a wide range of lifestyles (even if we exclude crocodile hunting!). Some groups will value a life of mindfulness and meditation, maybe favouring cultural enrichment over the accumulation of capital and wealth or simply choosing a life of quiet enjoyment of the countryside. Regardless of their preferences, individuals are likely to benefit from cognitive skills that enable them to better plan and execute their preferred goals. The case of the "mendicant monk" spending his life in isolation surrounded by books and meditating is given by Samuel Freeman as an example[249] that could be presented against the universality of the list of primary goods provided by Rawls. In this case the foreseen objection is that income and wealth will be of no value for this type of contemplative life. A Rawlsian, Freeman argues, could easily fend off this objection with three simple arguments. First the concept of wealth in Rawls's theory is suitably undefined and it includes things other than cold hard cash. The living quarters, library and the quiet surroundings that encourage meditation are also part of the wealth he enjoys. Therefore, it is the case that "some degree of wealth is instrumental to any person's good."[250] Second, even if they decide to abjure all material possessions, the Rawlsian theory would not stop them from doing so. Citizens would be free to donate these goods to other causes important to them. Finally, Freeman believes that the fact that there is a possibility that at some point citizens might change or revise their life plans it might seem prudent to hang on to valuable resources that facilitate this change. When applied to cognitive enhancements, these counterexamples can be combatted by arguing that, even if we decided to genetically increase the intelligence of our future offspring, this would not confer them any disadvantage should they choose the life of the mendicant monk. Sarah Goering comes to this conclusion in her effort to

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[248] Rawls, J. (1980). "Kantian constructivism in moral theory." *The journal of philosophy*, 515-572. Page 518

[249] Freeman, S. (2007). *Rawls*: Routledge. Page 153

[250] Ibid.

compare the decision to enhance a future child's intelligence as opposed to, for example, increase their height. Whereas it seems that being tall could be even harmful in a world designed for short people (she describes a life of head bumping and not fitting though doorframes), this is very different when the decision is to increase intelligence:

> *"Presumably, improving intellectual capabilities would be desirable in any society, and having more of it in a society that is less intelligent would not result in any significant disadvantage."*[251]

This near-universality criterion has also been used by other authors in their attempt to extend the list of Rawlsian primary goods. In this line, Buchanan et al. define natural primary goods as "general purpose means, useful in carrying out virtually any plan of life."[252] In his work however, Buchanan is careful not to advocate the implementation of particular genetic enhancements unreservedly. The key for Buchanan is whether these potential primary goods will be broadly valuable across a wide range of life plans. He then proposes enhanced memory as an example of a capacity meeting this requirement claiming that substantially increasing the capacity for memory[253] would result in improvements in people's capacity to pursue most life plans. Additionally, Buchanan also defines a "reasonable minimum level of education" as an all-purpose good valuable for the pursuit of most life plans provided by most democratic governments. This is reminiscent of Rawls's own theory who supports the idea that governments should be committed to a provision of universal basic education in order to promote and protect opportunities. In a similar vein and, imagining that we would be able to prove that similar universal benefits could be derived from genetic interventions, Buchanan writes:

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[251] Goering, S. (2000). "Gene Therapies and the Pursuit of a Better Human." *Cambridge Quarterly of Healthcare Ethics*, 9(03), -. Page 367

[252] Buchanan, A., Brock, D. W., Daniels, N., and Wikler, D. (2001). *From chance to choice: genetics and justice*: Cambridge University Press. Page 168

[253] The enhancement of memory can however have negative unforeseen consequences. When suffering traumatic events, being able to remember every single detail might be counterproductive stopping us from moving forward and pursuing our goals.

> *"if genetic interventions become possible that would prevent comparable harms or secure comparable benefits, they could also be justifiably encouraged or required by the state."*[254]

Despite seemingly endorsing some valuable genetic interventions, Buchanan brings our awareness to the threat to value pluralism or diversity of the good that failing to meet this near-universality criterion can bring:

> *"What is regarded as a natural asset as opposed to a natural deficit and which natural assets are regarded as most valuable depend in part on what we assume to be a good human life."* [255]

The point raised by Buchanan highlights how choosing desirable traits may undermine the diverse range of values held across different cultural groups. The issue of how certain deeply held values might be weakened by the introduction of genetic interventions is perhaps best represented by a religious doctrine that considers genetic interventions as morally repugnant. We can call this the "Playing God Argument" as previously presented in Chapter 3. Here we have a group of citizens adhering to a comprehensive religious doctrine that regards the genome modification of our offspring not only as unnecessary for the pursuit of their goals but also morally repugnant. In this case the near-universality response may not suffice to address the objections raised by the religious doctrine. Their worry rests on the nature of the good and on what it signifies, rather than the value that the goods might have for the pursuit and realisation of goals and life plans. Rawls might answer this objection by claiming there is no obligation to intervene in the genome of our offspring if this happens to go against our deeply held convictions. The protection given to the citizen's basic rights and liberties means that genetic interventions would not at any point be compulsory and people should be able to freely choose whether or not to enhance their offspring. Similarly, an appeal to reasonableness would preclude any comprehensive doctrine from imposing their beliefs on other citizens. The limited scope of the political conception affects the

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[254] Buchanan, A., Brock, D. W., Daniels, N., and Wikler, D. (2001). *From chance to choice: genetics and justice*: Cambridge University Press. Page 174

[255] Ibid. Page 80

type of public discourse that can be offered to shape constitutional essentials.[256] Appealing to the creed and beliefs attached to our own comprehensive doctrine is not a permissible way of political justification. That is, whilst some citizens may find these interventions to be morally repugnant not only for themselves but for everyone, the principles of political justice would stop them from preventing others from using these interventions.

Arguably, Rawls would have been aware that no comprehensive list of primary goods could have been developed that ultimately served the goals of all comprehensive world views. The fact that Rawls restricted the value of primary goods to **most** life plans betrays this worry. Holding out for the universal applicability of such goods could have derailed the development of his political conception altogether. This clearly highlights the difficulty of reaching a universal consensus on the good life and further complicates the choice of germline interventions.

Before proceeding to assess the condition of neutrality, I shall address the related objection that intervening in our children's genome in order to increase their cognitive capacities might hamper their range of opportunities.

This objection is clearly linked to the autonomy concerns summarised in Chapter 3. Recall Joel Feinberg's argument stating that our offspring's autonomy rights are violated when we narrow or close their future options and respected when our actions are directed towards keeping these options open.[257]According to this view future children should be granted the right to "reach maturity with as many open options, opportunities and advantages as possible."[258] Before reaffirming the near-universality quality of genetic cognitive enhancements, we need to make sure that this does not come at the expense of opportunity. The question then is whether increasing the reasoning capacities of children as proposed in this thesis will shrink the array of opportunities of our offspring.

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[256] A more detailed discussion on the content of the public discourse or public reason is offered in Chapter 6 where the issue of stability of the well-ordered society is discussed.

[257] Feinberg, J. (2007). "The child's right to an open future."

[258] Ibid. Page 80

Enhanced cognitive capacities, however, are likely to have the opposite effect. Increasing the fluid intelligence of future citizens can improve their capacity to evaluate available life plans and widen the access to alternative courses of actions that might not have been considered otherwise. Furthermore, their problem solving skills could improve, helping them to overcome the hurdles that might have otherwise blocked potential career or job opportunities. Mianna Lotz's[259] response to concerns about limitations to the autonomy of future generations similarly defends the promotion of certain rational capacities for their role in the development of the child's autonomy. Lotz has defended the view that "capacities of rational thought and self-control, and freedom from pathologies such as self-deception" are internal "adequate conditions for a child's emerging autonomy." [260] As parents, Lotz claims, we have a positive duty to provide these conditions and therefore, to promote the autonomy of our offspring. Parents would fulfil this duty "by seeking to develop in their child the skills and capacities for information seeking, critical reflection, deliberative independence, and the like."[261] In Lotz's view the enhancement of these capacities will positively contribute towards their autonomy, understood as the ability to independently choose and strive towards achieving the goals and life plans future offspring choose to adopt.

An alternative approach to avoid the open future objection, would be to increase the number of genetic enhancements available for parents to use rather than try to select a few that would fit the right criteria.[262] More specifically, should all offspring benefit from ALL enhancing interventions there would be no issue of any opportunities being narrowed. Quite the opposite, the range of opportunities open to them would widen as we expand their range of natural talents.

This could be a viable option if technological advances were safe and widely available, and if socio-economic resources were limitless. In this situation parents could provide their offspring with a wide range of enhanced capacities as long as

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[259] Lotz, M. (2006). "Feinberg, Mills, and the child's right to an open future." *Journal of social philosophy*, 37(4), 537-551.

[260] Ibid.Page 546

[261] Ibid.Page 547

[262] I am thankful to my supervisors for bringing this objection to my attention

they did not pick and choose isolated specific interventions that had the potential to narrow their opportunities. This 'all or nothing' approach would mean that enhanced children, having received all available interventions, have the option to then choose to develop the capacity of their choosing. Their range of opportunities would not be prejudiced by being predisposed towards one particular capacity. The challenge of denying them an open future would then only arise when choosing one particular enhancement precluded another type of intervention.

However, the circumstances of justice that motivated Rawls's theory are found "whenever persons put forward conflicting claims to the division of social advantages under conditions of moderate scarcity."[263] If unlimited resources would be accessible to everyone in society, it would negate the need for a theory of justice. Rawls puts this succinctly: "there would be no occasion for the virtue of justice."[264]

Limiting the scope of interventions to genetic cognitive enhancements addresses several concerns. First, it addresses the concern that some interventions might narrow the range of opportunities available to future offspring. Second, they will not only be valuable across most life plans, but also provide citizens with a wider range of opportunities to choose from. Finally, given the conditions of moderate scarcity, it presents a more realistic alternative than the option of providing all enhancements to future children in order to avoid hindering their opportunities.

4.4.1.2 Meeting the neutrality criterion

Rawls's political conception of justice as fairness aimed to obtain the support of citizens holding a wide range of comprehensive doctrines. By narrowing the scope of his theory exclusively to the political sphere, he widened its appeal and therefore, its inclusivity. Guaranteeing the universal scope of his account of primary goods also implies that the chosen primary goods do not favour any particular comprehensive

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[263] The circumstances of justice reflect the historical conditions of modern democratic societies where, apart from dealing with moderate scarcity, citizens will engage in social cooperation with others affirming different and often irreconcilable reasonable conceptions of the good. Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 128

[264] Ibid. Page 128

doctrine and are therefore neutral across the different life plans that citizens are presumed to want.

The best way perhaps to illustrate how our genetic cognitive enhancements meet the neutrality condition is to outline and contrast previous attempts to increase the list of Rawlsian primary goods. Dov Fox[265] for instance, identifies short and long term memory, verbal and spatial reasoning and a general cognitive capacity as suitable candidates to be included in his wide-ranging definition of natural primary goods. His aim is to extend Rawls's idea of social primary goods classifying these traits as natural primary goods and defining these as "hereditable mental and physical capacities and dispositions that are valued across a range of projects and pursuits."[266] These natural capacities bear a clear similarity to the cognitive capacities that would be enhanced with the genetic technologies that I am here defending and could be considered near-universally valuable. However, not all natural capacities will have the same universal and neutral character.[267] To illustrate this difference Fox goes on to provide examples of what he considers natural non-primary goods. Capacities or traits such as sex, height, sociability and tonal pitch, loyalty, generosity, skin pigmentation and sexual orientation as such non-natural primary goods. These traits, according to Fox "may be advantageous or even indispensable for some or even many among the possible paths a child's life could take, but for others might not be useful at all."[268]

I agree that it seems doubtful that some of these capacities will be neutral across most permissible rational life plans and conceptions of the good. For instance, if we take creativity or musical ability as examples, it is hard to see how these capacities

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[265] Fox, D. (2007). "The Illiberality of 'Liberal Eugenics'." *Ratio*, 20(1), 1-25.

[266] Ibid.

[267] Fox also adds to his list "absence of disability, or resistance against disease". However both assume normality deficits that are outside the scope of Rawls's theory . The citizens of the Rawlsian society are normally functioning and fully able to participate in social co-operation. Although he does not devote much time to a discussion about health, he includes health as a natural primary good but always assuming that citizens will have the necessary levels to fully cooperate in society , citizens are therefore presumed to be "normal and fully cooperating members of society over a complete life, and so have the requisite capacities for assuming that role" See Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 21 and Rawls, J. (1999b). "A theory of justice - Revised Edition." *Harvard Univ Pr*. Pages 83-84

[268] Fox, D. (2007). "The Illiberality of 'Liberal Eugenics'." *Ratio*, 20(1), 1-25. Page 12

could be considered as natural primary goods in the Rawlsian sense or how technologies contributing towards their augmentation could be considered social primary goods, unless we chose a career dedicated to artistic pursuits and music. Furthermore, choosing those enhancements will not signal the kind of neutrality towards all possible life plans we need in the Rawlsian society. As Deena Davies highlights:

> *"Parents who go to great trouble to have a child with perfect pitch may find it very hard when the child spurns the piano for the basketball court."*[269]

The same argument applies with regards to increased strength or speed, which seem to be particularly and almost exclusively suited to the development of athletic pursuits.

Fritz Allhoff's[270] work presents another example of a Rawlsian inspired theory re-affirming the moral permissibility of genetic enhancements to the extent that they augment primary goods or contribute to their augmentation.[271] He believes that we should permit those interventions "if and only if" this condition is met. According to the author, the genetic enhancements that have a role as primary goods or contribute to their augmentation are: improvements to health, increasing resistance to disease, improvements to eyesight, speed, strength, increases in mental acuity, mathematical and spatial reasoning, language faculties, creativity and musical abilities. On the other hand, Allhoff believes that other interventions that, from his point of view, would contribute towards creating designer babies, such as alterations to height, eye colour or gender selection are not morally permissible.

Whilst the list that Allhoff provides is problematic in terms of near-universality and neutrality for the reasons previously presented, he is right in rejecting what he refers to as "designer babies" characteristics. Although he does not expand as to the

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[269] Davis, D. S. (2009). "The parental investment factor and the child's right to an open future." *Hastings Center Report*, 39(2), 24-27. Page 24

[270] Allhoff, F. (2005). "Germ-line genetic enhancement and Rawlsian primary goods." *Kennedy Institute of Ethics Journal*, 15(1), 39-56.

[271] "a strong argument can be made to support the moral permissibility of certain types of genetic enhancement in general and germ-line genetic enhancement in particular. Specifically, such interventions are morally permissible if and only if they serve to augment Rawlsian primary goods, either directly or by facilitating their acquisition" ibid. Page 15

reasons why these designer baby interventions should be rejected, they clearly would not meet the criteria required of Rawlsian primary goods

Explaining how the above interventions do not meet the universality and neutrality criterion helps to clarify why and how genetic cognitive enhancements do not fall foul of these requirements. When we expand our enquiry to interventions that, although beneficial, may not be so across a wide range of life plans, we run the risk of making a judgment on which lives are worth pursuing and therefore, giving up on the neutrality requirement. This value judgment is at odds with the inclusive scope of the Rawlsian conception of justice.

4.4.2 Primary goods essential for the successful development and exercise of the citizens' two moral powers.

This section defends the claim that the inclusion of the genetic cognitive enhancements outlined in this thesis, can, in their role as primary goods, effectively contribute towards the development and exercise of the citizen's two moral powers. The importance that Rawls devotes to the development of a sense of justice and a capacity for a conception of the good as moral powers is grounded on the concept of citizens relating to one another as free and equal individuals. The ideas of freedom and equality are essential to the development of the Rawlsian theory of justice, since it is on this conception of the person as free and equal that primary goods and the principles that regulate them are chosen.

In *Political Liberalism* Rawls writes:

> *"The basic idea is that in virtue of their two moral powers (a capacity for a sense of justice and for a conception of the good) and the powers of reason (of judgment, thought and inference connected with these powers), persons are* ***free****. Their having these powers to the requisite minimum degree to be fully cooperating members of society makes persons* ***equal****."*[272]

[272] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 19

Having the two moral powers makes persons free, having the powers at the requisite level to effectively function as citizens makes persons equal from a political perspective.

Being free in the Rawlsian sense, however, has two distinct meanings that are relevant to their role in the political and social arenas. Citizens are free, first, in so far as they are entitled to make appropriate demands on the basic institutions so that they are able to fulfil their goals and advance their conception of the good;[273] second, in their ability to revise and adjust their conception of the good at any time so that "those ends can be pursued by the means they can reasonably expect to acquire in return for what they can reasonably expect to contribute."[274] This second interpretation of citizens as free makes them responsible for their own ends. The ends they are entitled to pursue, in turn, will be determined by their allocation of primary goods. Should this allocation of primary goods not match their expectations, citizens are expected to revise their ends rather than demand a higher share of primary goods.

Similarly, persons are considered equal also in reference to their role as citizens. The equality of individuals stems from the recognition that everyone has an equal right to choose and assess the principles of justice that regulate the basic institutions.

Since genetic cognitive enhancements, in their role as primary goods, need to be chosen and distributed in a manner that these powers are developed effectively, it is important to briefly clarify the Rawlsian definition of these powers and how they are supported by primary goods.

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[273] Their condition as free make people see themselves as "self-authenticating sources of valid claims" in other words, they see themselves as being entitled to make the appropriate claims from social institutions to enable them to pursue and advance their particular conception of the good. Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 23

[274] Rawls, J. (2005). *Political liberalism*: Columbia University Press. page 34

4.4.2.1 A sense of justice and the idea of reasonableness

The first moral power presented by Rawls is the capacity for a sense of justice. Having this power equips citizens with the ability to understand, apply and act by the principles of justice.

The sense of justice is closely related to the capacity for reasonableness. When citizens recognise and act from the principles of justice whilst also acknowledging that others have an equal claim in matters of justice they are said to be acting reasonably. Reasonableness also implies that citizens willingly abide by the terms of cooperation knowing that others will behave in the same way. It requires that we hold our own comprehensive doctrine without imposing it on anybody else, whilst expecting that our own view will be respected even if it is not shared by the other citizens.

The assumption that citizens are reasonable or have a sufficient sense of justice has important implications for the stability[275] of the Rawlsian society. For this reason, Rawls will go to great lengths to choose principles of justice that ensure that the appropriate primary goods are secured to enable the citizens to develop this moral power.

Securing basic rights and liberties is deemed by Rawls to be essential for the development and exercise of the citizen's sense of justice. In particular the protection of **equal political liberties** and **freedom of speech and thought** provide citizens with the tools to develop and exercise their sense of justice. These liberties are considered essential not only for enabling political participation but also for the application of the principles of justice in a free and informed manner[276] and judging, using our rationality, whether the basic institutions and the social policies generated by them are just.[277]

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[275] The issue of stability will be carefully explored in Chapter 6. For now, the mention of stability is used to emphasize the importance of the development of this moral power.

[276] "The equal political liberties and freedom of thought are to secure the free and informed application of the principles of justice, by means of the full and effective exercise of the citizens' sense of justice, to the basic structure of society". Rawls, J. (1971). *A theory of justice*: Belknap Press. Pages 334-335

[277] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 45 and 169

4.4.2.2 A capacity for a conception of the good and the idea of rationality

Alongside this sense of justice, the citizens as normally functioning free and equal agents will also develop the second moral power, also known as the capacity for a conception of the good. This second moral power enables citizens to develop, pursue and revise their chosen ends, wanted for their own sake over a complete life. In contrast to the capacity for reasonableness, this moral power is closely related to the idea of persons as rational agents. A moral agent is considered to be rational by Rawls when he/she exercises "powers of judgement and deliberation in seeking ends and interests peculiarly its own."[278]

The equal allocation of what Rawls refers to as civil liberties; **liberty of conscience**, **liberty of association** and **free choice of occupation** is protected by the first principle of justice. These liberties enable citizens to develop a capacity for a conception of the good and to exercise this power effectively.[279] Their protection safeguards the citizens' inviolable rights to hold their own beliefs, rights to expression, inquiry and association. They also allow citizens not only to choose and rationally pursue their conception of the good[280] but also to change this plan or choose a different one if/when they think it is appropriate.

Being able to hold the views we consider valuable, whether these are moral, religious, or philosophical is non-negotiable for Rawls because of their impact on our ability to lead the life we want within our chosen comprehensive view. Combining these rights with the fundamental freedom of association also enshrined within the political liberties, allows citizens to successfully join groups or associations and hence engage in social cooperation. These rights are essential for example for the exercise of our chosen religion, engaging in fruitful employment and the exercise of our political rights in a safe setting without fear of being prosecuted or marginalised.

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[278] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 50

[279] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 45

[280] Ibid.

4.4.2.3 The use of genetic cognitive enhancements for the development of the two moral powers

Supplementing the discussion of the appropriate primary goods for the exercise and development of the two moral powers, Rawls seems to suggest a third power needed for the exercise of these two moral powers. Although he doesn't devote much time to this in his writings, he asserts that "intellectual powers of judgment, thought and inference" are also required. Likewise, in *Justice as Fairness* Rawls adds that the development and exercise of the judicial virtues of impartiality and judiciousness, as excellences of our moral sense of justice, requires intellect and the powers of reason and imagination[281]:

> *"These powers involve intellect and imagination, the capacity to be impartial and to take a wider and more inclusive view, as well as a certain sensitivity to the concerns and circumstances of others"*

These capacities seem to correlate well to the technologies designed to enhance the capacities linked to our fluid intelligence. Furthermore, the above passage suggests that these capacities could be considered valuable for the development of the two moral powers. In Rawls's view these capacities are present in individuals at different levels, with differences in the above minimum required to be a fully cooperating member of society.

Looking first at the sense of justice, these varying natural cognitive capacities together with the genetic interventions to augment them can contribute to their development in a number of ways. As Rawls points out, the judgements that citizens make, guided by both their capacity for reason and their sense of justice will vary. Some judgements will apply to the basic structure and how effectively this is ruled by the principles of justice, whereas some others will apply to the particular actions and character of fellow citizens. When judging the basic structure of society, an increased ability to reason and assimilate the detailed and often complex details of constitutional laws might enable citizens to better assess whether the protection given to basic rights and liberties is sufficient. This improved understanding will

[281] Ibid. Pages 29 and 170

lead citizens to be more or less willing to endorse the principles of justice and perhaps push for amendments of constitutional changes through political participation, and to judge theirs and other people's preferences and outcomes as fair or unfair. The higher our level of reasoning skills the better the assessment we will be able to make of both the principles of justice ruling the basic structure and the social policies that emanate from them. Similarly, at the level of their relationship with fellow citizens, they will be in a better position to assess the validity of the claims each of them makes on justice grounds. These claims will have to be restricted to the jurisdiction of political justice and only insofar as they affect their status as citizens in their exercise of their two moral powers.

Secondly, the capacity for a conception of the good may also be affected by these newly enhanced capacities. In particular the improvement of information processing involved in decision making may help citizens evaluate and revise, if needed, which life plan is the best to pursue given their allocation of primary goods, hence using this allocation in the best possible way.

Thirdly, the development of both moral powers faces a further difficulty which is brought by a characteristic intrinsic to pluralistic societies. This is what Rawls calls the burdens of judgement. These burdens of judgment are defined as the obstacles we face when we exercise our powers of reason in our ordinary and political lives being influenced by our social background, particular life experiences, upbringing, professional occupation and the evidence available to us when assessing often complex moral and political values. These obstacles will also affect how each of us, within our own comprehensive doctrine, will answer questions of religion, morality and philosophy.

Amongst the factors that constitute these burdens of judgment, we find that three of them directly relate to the barriers to reasoning and reaching a consensus between individuals.[282] Rawls defines these as the difficulties faced when assessing and evaluating complex evidence, the different priority and weight that people give to relevant considerations, and the vagueness linked to all our concepts. A fourth

[282] Fluxman, T. (1998). "Critical remarks on Rawls's burdens of judgement." *South African journal of philosophy*, 17(4), 363-376.

hurdle relates to how our set of values is determined by our own unique experiences which will inevitably differ from those of other citizens. The fifth burden identified by Rawls highlights how differently people value moral and political values differently. Finally Rawls acknowledges that, notwithstanding the plurality of values existing in society, social institutions will only be able to choose a limited set of "cherished values" within its limited scope.[283]

According to Rawls these burdens of judgement are particularly relevant in the evaluation of political rulings, due to their inherent level of complex and conflictive nature of the issues they commonly address and the fact that available evidence is often vague.

Whether these burdens of judgements can or cannot be overcome may have implications to the weight that Rawls gives to reasonable pluralism in his political conception. Rawls considered that the burdens of judgement were an indisputable fact that gave rise to the pluralism characteristic of modern democratic societies. As such, the existence of the burdens of judgements are a consequence of the co-existence of often incompatible comprehensive world views. Citizens holding incompatible comprehensive doctrines face limits on the kind of thing they are able to justify to one another. Their convergence on issues relating to their own comprehensive doctrines is often very limited. Therefore, agreement on laws regulating the basic structure cannot be sought by appealing to any one comprehensive doctrine unless we are willing to impose our view by force. For this reason, the level of justification is restricted to questions of political justice.

Despite the difficulties that pluralism may cause in reaching a unanimous political consensus, Rawls cherishes this type of diversity in his liberal conception of justice and, having considered that the burdens of judgement are part and parcel of embracing pluralism, he argues that public debate needs to only apply to political reasons.

Notwithstanding these considerations, the possibility of enhancing cognition can be particularly relevant to the three burdens of judgement that relate to our reasoning

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[283] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Pages 54-58 and Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Pages 35 and 36

and consensual ability. Possessing a higher level of fluid intelligence and being able to better resolve problems, for example, might help us to better evaluate diverse and often incomplete evidence. We will be able to better break down the evidence presented to us into more manageable components, analyse more comprehensively, and identify the information gaps that might stop us from deciding between different moral and political judgements. We might also be in a better position to recognise the characteristics that make-up a reasonable comprehensive doctrine as well as reject those political views that would not be shared by free and equal citizens.

It is important to note that these potential impacts on the burdens of judgements are here only presented as a potential consequence of the introduction of genetic cognitive enhancements. A more detailed analysis of the epistemic component of reasoning would need to be undertaken before making any final assertions. Should we assume that the effect on the burdens of judgement does indeed happen as described above, the Rawlsian theorist might need to consider the following implications. First, the fixed and unchangeable character of the burdens of judgements may need to reviewed. In this way the limits of practical reason set by the existence of the burdens of judgments can be made more manageable, hence reaching a broader consensus for the political conception. Although, the burdens of judgement are unlikely to ever be eliminated due to the individual's life experience and the different force of other normative considerations, we might find that more convergence between individual comprehensive doctrines is achieved. Second, having realised that there is more common ground between different conceptions than originally thought possible, the area of consensus between individuals can be expanded beyond the political arena. Arguably this might lead to a more harmonious society having a positive effect on the stability of society over time.

The role of these cognitive enhancements in the positive development of the two moral powers shows how the Rawlsian thinker would not object to their incorporation into the framework. However, whether the Rawlsian theory requires the help of these capacities to strengthen the development of these moral powers is another question altogether, and one that will need to be addressed in order to complete this discussion.

4.4.2.3.1 – A sufficient level of moral powers – Genetic cognitive enhancements not needed for the development of the two moral powers

Regardless of the contribution that genetic cognitive enhancements can make to the development of the two moral powers there is a powerful counterargument rooted on the very conception of the Rawlsian person.

All along, Rawls maintained that the two moral powers only need to be developed to a sufficient level for free and equal citizens to operate as fully cooperating members of society. This is working on the assumption that people function at a "normal" level without any deficits in cognitive capacities. The technologies here proposed will augment cognition taking it above the level that Rawls does not consider necessary for individuals to fulfil their role as citizens. Since we can assume that those basic capacities are met by all citizens, the responsibility of the basic institutions is solely that of providing the general all-purpose means to "train and educate their (the citizens') basic capabilities."[284]

These all-purpose means, apart from the basic rights and liberties, will include a general provision of basic education. The provision of education in Rawls's political conception is briefly explained in *Political Liberalism* as follows:

> *"Society's concern with their education lies in their role as future citizens, and so in such essential things as their acquiring the capacity to understand the public culture and to participate in its institutions, in their being economically independent and self-supporting members of society over a complete life, and in their developing the political virtues, all this from within a political point of view."*[285]

The essential components of the basic education that Rawls refers to in the above passage is circumscribed to the role of children as future citizens. It will equip children with an understanding of the constitutional rights and liberties and their protection as well as a grasp of the economic structures that distribute socio-economic goods and it will encourage the development of the political virtues

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[284] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 171

[285] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 100

associated with a sense of justice. In addition to this, the provision of basic education will contribute to the citizens becoming economically self-sufficient, fully cooperating members of society.[286] The kind of education that Rawls has in mind will also have a role in the cultivation of the reasoning skills needed for the effective exercise of their sense of justice and capacity for a conception of the good.

Although I concede that these cognitive enhancements will not be required from a Rawlsian perspective if the normal functioning hypothesis is accepted, they still positively contribute towards their development. Consequently, even though they are not needed, they could still be deemed permissible from a Rawlsian perspective. Furthermore, it seems that there could still be a role for these interventions within the Rawlsian framework, not dissimilar to that given to education. This role could be considered to be complementary in the sense that the introduction of genetic cognitive interventions could "enhance" the outputs achieved through education. Providing citizens with improved unrealised cognition is likely to mean that the realisation of these capacities via education is improved. Furthermore, if we accept that an increase in natural talents (other things being equal) means that lesser training or educational resources are needed to achieve equally good results[287], the introduction of cognitive enhancements might result in a more efficient use of educational resources. This improvement in the realisation of capacities through education can be defined as the “efficiency argument” in that offering these interventions alongside education to better train the citizens in the exercise of their moral powers will, arguably, result in better outputs with the same level of educational resources. Under this efficiency argument, we might find that, in time, the provision of genetic cognitive enhancements alongside education is the best way to develop the citizen’s two moral powers.

Should the efficiency argument not hold, there is an additional argument to incorporate these technologies as potentially valuable as primary goods within the Rawlsian framework. Rawls did not include all primary goods as valuable for the

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[286] Ibid. Page 199

[287] Kollar, E., and Loi, M. (2015). "Prenatal equality of opportunity." *Journal of Applied Philosophy*, 32(1), 35-49. Page 38

development and exercise of the two moral powers. Whilst basic liberties were specially earmarked for this purpose, the role of income and wealth was limited to the actual realisation of these moral powers[288] and the advancement of the citizen's chosen ends. Economic resources, in Rawls's view may not contribute to the development of our moral powers. However they will impact on the citizen's ability to engage in political participation and successfully pursue their chosen life plan.

This chapter has shown how these cognitive technologies can help the actual exercise of these powers and the pursuit of goals belonging to a wide range of comprehensive doctrines. Therefore, even if we accept that these enhancements are not necessary for the development and exercise of the moral powers, enough conditions are met to warrant their inclusion as primary goods.

4.5 Genetic cognitive enhancements and the index of primary goods

Even when we accept that the genetic cognitive enhancements I have evaluated meet the conditions required of primary goods, there is one further stumbling block that might prevent us from treating these interventions as such. To successfully cement their suitability as primary goods I need to demonstrate that the Rawlsian index of primary goods offers the required flexibility and can be modified to incorporate these new goods.

4.5.1 A modifiable Rawlsian Index

Amartya Sen[289] criticised the Rawlsian index of primary goods for not addressing the fact that citizens had different capabilities to convert those goods into actual utility. In particular, Sen's criticism revolves around the disadvantage experienced by individuals functioning below the normal level and how they need more socio-economic resources to achieve the same level of utility or wellbeing.

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[288] Rawls only mentions the role of income and wealth in 'realizing the two moral powers' in 'Justice as Fairness, a Re-statement' . It is not clear either what the difference between **exercising** an **realising** might be in this context or indeed whether Rawls himself saw a difference between both terms. Rawls's belief that inequalities in wealth have a bearing on our ability to engage in political participation and the level of opportunities available to all is implicit in his writings. Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. 169

[289] Sen, A. (1980). "Equality of what?". City: Stanford University, pp. 26.

Rawls had always insisted on the necessity to avoid these hard cases in order to develop his theory. If he succeeded in demonstrating that the principles of justice and their applicability worked for normally functioning citizens, then further work could be done to extend the theory and deal with those hard cases. Nonetheless, in response to Sen's criticism, he devoted a section in *Justice as Fairness, A restatement* to discuss and introduce a degree of flexibility in the index of primary goods that would address the citizens' "differences in needs arising from illness and accident over the course of a complete life"[290].

The key relevant point of the flexibility granted to the index of primary goods with regard to the question whether genetic cognitive enhancements could be included is the acknowledgement that this index is not fully specified. Moreover, it has a provisional character at the point when the principles of justice and the primary goods they regulate are chosen. The development of Rawls's conception of justice follows a four stage procedure,[291] beginning with the selection of the principles of justice themselves. The initial choice of the regulatory principles of the Rawlsian society is made under conditions that avoid the biased effect of morally arbitrary factors. At this initial stage, the particular native talents and social conditions of the individuals are ignored. Based on the widely held moral intuitions of modern democratic society, a general and broadly unspecified set of principles and primary goods is drawn up. The second stage sets out the constitutional grounds, granting protection to the basic rights and liberties of citizens using as a guide both the principles of justice and the socio-economic circumstances of the particular society. The third stage involves the enactment of laws and socio-economic policies where the application of the difference principle and protection of opportunities is regulated alongside a definite list of social primary goods. The list of primary goods might be extended taking into account the cultural and economic conditions of society when these are fully known. The fourth and final stage consists of the application of laws and policies to particular individual cases. Considering the individual circumstances of citizens and how rules must be applied to particular

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[290] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Pages 168-179

[291] Rawls, J. (1971). *A theory of justice*: Belknap Press. Pages 195-200

cases, defines the final stage of the Rawlsian conception. At this stage, Rawls incorporates some flexibility on the applicability of the principles of justice particularly with regards to distributive questions of socio-economic goods.

The subsequent fuller content of the index of primary goods will then be finalised at this legislative stage taking into account this richer set of information regarding the different social conditions as well as the various personal goods and services the government provides for citizens. This will inevitably also affect the weight given to each primary good within that index. Rawls uses the possibility to revise the index at legislative stage as an opportunity to consider the possibility of incorporating some healthcare provision as a way of addressing Sen's objection. Although Rawls recognises that this does not fully solve the issue of those persons with "grave disabilities",[292] he introduces the prospect for the modification of the index to allow situations where "citizens may be seriously ill or suffer from severe accidents from time to time"[293].

An index of primary goods is not viewed as rigid but rather as indicative of the sorts of the things that people value in societies regarded as just. As Rawls himself claims:

> *"This indeterminacy in the theory of justice is not in itself a defect. It is what we should expect."*[294]

The flexibility offered by Rawls's conception of justice is in line with the possible range of societal arrangements that can accommodate the principles of justice and helps to address Sen's concerns about the unsuitability of the list of primary goods. Furthermore, this acknowledged flexibility opens the door towards the introduction of genetic cognitive enhancements into the index.

4.5.1.1 Incorporating genetic cognitive enhancements into the index of primary goods

The consideration of healthcare as a potential primary good provides a sample case as to how Rawls is prepared to deal with any extensions to the index of primary goods. Unlike the genetic cognitive enhancements, however, basic healthcare has the

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[292] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 170

[293] Ibid. Page 173

[294] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 201

function of restoring citizens to normal functioning whenever it is required. The incorporation of genetic enhancements assumes an already normally functioning level taking the individual beyond normality.

Although the baseline level from which both healthcare and genetic interventions operate is different, the arguments already proposed for considering genetic cognitive enhancements as primary goods are still sound. Since our chosen technologies have been shown to meet the requirements needed of primary goods in the same way that income and wealth do, this I believe is enough justification to at least recognise the possibility or even desirability for cognitive genetic interventions to be added to the index of primary goods at the constitutional stage.

At this constitutional stage there would be a recognition that the bundle of primary goods for each individual, subject to the inequalities permitted by the difference principle, should include genetic cognitive interventions. This overall bundle of primary goods would include an equal share of basic rights and liberties but the genetic cognitive enhancements, powers, offices, authority and wealth and income could vary in their allocation. At this point, genetic cognitive enhancements are simply additional components of an index designed to make interpersonal comparisons, to identify the least advantaged members of society and ultimately evaluate the permissibility of any potential socio-economic inequalities. Being the recipient or not of genetic cognitive enhancements will be another factor that needs to be taking into account to identify the worst off representative group, and to make interpersonal comparisons in the distribution of socio-economic goods.

The variation between all types of goods and how they compare in value against one another is something to be decided at the legislative stage. One of the options to be considered could be the application of different weights to the worth of these technologies relative to the other goods making up the index of primary goods. This approach is inspired by the aggregative resource principle whereby, the bundles of primary goods across citizens will be equal overall, although variations in the composition of those bundles would be permissible.[295]

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[295] Buchanan, A. (1995). "Equal Opportunity and Genetic Intervention." *Social Philosophy and Policy*, 12(02), 105-135. Page 108

Applying weights might however add a level of complexity that Rawls was keen to avoid in the formulation and applicability of his principles. Rawls's solution to the weight problem was to use income and wealth as a rough indicator of the overall aggregative value of the index. It is not clear how we would better Rawls's solution and systematically rank or weight all the different goods within the index. Besides, requiring a clear estimation of the value allocated to each of the goods independently, would also require careful thinking about how each of the goods relates and interact with one another. For instance, it might not be easy to establish how genetic cognitive enhancements correlate with powers and prerogatives of office or to what degree being able to access these technologies results in a strengthening of the social bases of self-respect. Holding positions of authority might affect our self-respect in a very different way to our family background, emotional capacities or peer influence (to name a few). The fact that these new technologies are in the very early stages of development adds another layer of difficulty with regards to their measurability. This issue will remain challenging at the very early stage of implementation when their effectiveness may be hard to establish.

Once these genetic technologies are available, we will also need to decide whether their value is to be determined, for example, by a market price system or whether we should instead measure the levels of utility they generate. In time we might have access to information regarding their efficacy. This might then generate information about the real effect of these technologies and how they translate from mere potentialities to actual talents resulting in an improvement in the life prospect of individuals. Both the market value and utility measurement approaches have their difficulties and often rely on the type of value judgements about welfare that Rawls has always tried to avoid.

A more suitable alternative to avoiding falling into a perfectionist valuation of these technologies might be through the assessment of achieved milestones. These might include gaining a University degree, a doctorate, tenure post at a university or gaining skilled employment in open competition, to name a few. I believe that this is what Rawls would have had in mind when he talked about realised native

endowments and how they might be used to identify the least advantaged representative group:

> *"Thus this group includes persons whose family and class origins are more disadvantaged than others, whose natural endowments (as realized) permit them to fare less well, and whose fortune and luck in the course of life turn out to be less happy, all within the normal range (as noted below) and with the relevant measures based on social primary goods."*[296]

It does seem like the kind of achievements resulting from the introduction of genetic interventions could play a valuable role in the assessment of the lifetime shares of individuals. However, the exact effect measure of these technologies would be very hard to establish even if we are able to isolate the many confounding factors that might have contributed to the achievement of these milestones.

All these approaches to put a weight and value to these new technologies seem to encounter the measurability problem that Rawls wished to avoid in order to keep his political conception simple and workable. In *Justice as Fairness, A Restatement,* Rawls indicated that measurability was one of key factors that stopped him from considering extending the list of primary goods to include realised natural talents in the index:

> *"If necessary we can also include in the index realised native endowments and even states of consciousness like physical pain. However, for the sake of having an objective measure and relying on information that is readily available and easy to comprehend it is much better not to include such goods in the index."*[297]

Reinforcing his requirement for simplicity, Rawls is reluctant to make the list of primary goods longer than necessary:

> *"What is crucial is that in introducing these further goods we recognize the limits of the political and practicable: first, we must stay within the limits of justice as fairness as a political conception of justice that can serve as the focus of an overlapping consensus; and second, we must respect the constraints of simplicity*

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[296] Rawls, J. (1999b). "A theory of justice - Revised Edition." *Harvard Univ Pr*. Page 83

[297] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 179

and availability of information to which any practicable political conception (as opposed to a comprehensive moral doctrine) is subject." [298]

Notwithstanding the seemingly puzzling issue of measurability and the need for simplicity, I have shown in this section how the index of primary goods provides the necessary flexibility for the incorporation of these technologies. Perhaps the simplest answer to the issues presented by the proposed extension of primary goods is to follow Rawls's guidance. This would involve addressing the measurability problem by using wealth and income as proxies to measure the relative allocations between individuals and the position of the worst off representative groups. Although I have offered a number of alternatives for weighing these new technologies, these do not present an easily implementable solution to the measurability problem, partly caused by the little available knowledge about the interventions themselves. I do not attempt to argue for any specific system, my aim is merely one of showing there could in time be some objective measure that will enable the appropriate adjustment of the index of primary goods.[299]

4.6 Conclusion

Differences in natural talents have an impact on the life prospects of individuals. This impact has been recognised by liberal egalitarian theories, for example, in the Rawlsian political conception of justice as fairness.

Having analysed the role that natural capacities in general play in the development of the Rawlsian theory, this chapter examined whether there is room for considering the influence of reasoning skills or fluid intelligence in people's lives and incorporating this into this framework. It was shown that these capacities are morally arbitrary from the viewpoint of justice, but that the inequalities caused by them will need to be addressed as a matter of justice

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[298] Rawls, J. (1988). "The Priority of Right and Ideas of the Good." *Philosophy & Public Affairs*, 17(4), 251-276. Page 258

[299] Proposing a comprehensive mechanism as to how this index would work is outside the scope of this thesis. I am merely putting forward the possibility that these technologies could, in the future, be quantified in a way that would make their introduction in the index of primary goods feasible.

New technological advances in genetics provide us with the tool to modify these natural capacities and therefore to increase the cognitive levels of individuals.

These technologies were shown to qualify as primary goods in terms of their value as all-purpose means for the pursuit of a wide variety of ends. These genetic cognitive enhancements were shown to meet the near-universality criteria and to be neutral across different and opposing comprehensive views without committing to any particular comprehensive doctrine. Moreover, they have the potential to widen the range of opportunities available to individuals.

Even though they are not considered necessary for the development and exercise of the two moral powers, their positive contribution, the fact that they might contribute to them provides an additional argument for their permissibility.

Having explored their feasibility as social primary goods, I contended that the Rawlsian index is flexible enough to allow for the introduction of these goods. Despite concerns about their measurability, the index provides the flexibility required to incorporate these technologies. Whilst wealth and income can continue to be used as proxy measure to assess the individual's lifetime shares of social goods, genetic cognitive enhancements have now been added to the list of Rawlsian primary goods. These technologies will help to make interpersonal comparisons, to identify the least advantaged members of society and, ultimately, to be part of the process to assess permissible inequalities in socio-economic shares

Chapter 5. Genetic cognitive enhancements and their potential negative impact on social justice

Having shown that genetic cognitive enhancements are suitable candidates to become Rawlsian primary goods, the next step is to explore whether the principles of justice themselves may be compromised by the introduction of these goods. Allen Buchanan[300] believes that the real challenge associated with these newly emerging technologies is to ensure widespread access to innovation. Restricted access can lead to fears about increases in socio-economic inequalities, limited access to jobs and positions of responsibilities and a potential erosion of the rights and liberties of the unenhanced class. This has been referred to as "the diffusion problem"[301] and it commonly applies to new expensive biotechnologies. The diffusion problem arises when new injustices are created through the limited or slow diffusion of innovations to the least advantaged. This problem of limited access is thought to create unacceptable advantages in economic, social cooperation or even political power for those wealthy enough to afford these new technologies.

My analysis begins with an assessment of the effect that these technologies may have on the citizens' civil and personal liberties caused by limited access to genetic cognitive enhancements. I explore how the basic rights and liberties of those unable to access these technologies might be eroded by the enhanced population due to the increased political and economic power derived from their superior cognition. The potential effect that these technologies can have in the competitive jobs and positions available to the unenhanced citizens is explored as is the effect the creation of an increasingly uneven playing field can have in the acquisitions of socio-economic shares.

These objections are each addressed from a Rawlsian perspective as I evaluate how the political conception governed by the Rawlsian principles of justice is able to ease the concerns emanating from the introduction of genetic cognitive enhancements. The social justice objections caused by the "diffusion problem" can be avoided in a

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[300] Buchanan, A., Cole, T. and Keohane, R. O. (2011). "Justice in the Diffusion of Innovation." *Journal of Political Philosophy*, 19, 306–332.

[301] Ibid.Page 313

well-ordered society regulated by principles of justice that give priority to the protection of basic rights and liberties and ensures the fair value of political liberties. The FEO principle forbids discrimination on access to positions based on the enhanced status of individuals. The position of the FEO will also be strengthened with an extension that I call the "**formal equality of access to genetic cognitive enhancements principle**", requiring that no legal barriers are created to stop citizens from accessing these technologies. The potential socio-economic inequalities caused by these new interventions will need to be such that they are to the maximum benefit of the worst off. The priority given to FEO over the difference principle demands the avoidance of excessive wealth accumulation in the hands of the few resulting in a loss of opportunities for the worst off.

Having addressed any potential concerns from a Rawlsian perspective I outline how the introduction of genetic cognitive enhancement working alongside the provision of public education can potentially strengthen the work done by the FEO principle.

Next, I distinguish my account from two other attempts to extend Rawls's theory of justice. First, I show how my account is related to Norman Daniels' defence of a Rawlsian version of the FEO principle regulating access to healthcare. Second, I compare my Rawlsian defence of the introduction of genetic cognitive enhancements to Colin Farrelly's "lax genetic (or biological) difference principle" and his proposal to regulate inequalities in the distribution of biological capacities to realise natural primary goods.[302] I will show that both accounts require substantial changes to the Rawlsian framework and are not able to adequately address the introduction of technologies that take citizens beyond the normal level of functioning. Unlike these accounts, my proposal to incorporate genetic cognitive enhancements in Rawlsian theory remains faithful to the Rawls's set of specifications for his liberal political conception.

The chapter concludes that a well-ordered society governed by Rawlsian principles of justice can permit the introduction of genetic cognitive enhancements. The holistic application of the two principles will prevent the unjust consequences that critics fear. Moreover, the voluntary uptake of these technologies may contribute

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[302] Farrelly, C. (2016). *Biologically Modified Justice*: Cambridge University Press. Page 139

towards meeting the goals of Rawlsian justice by broadening the range of opportunities open to citizens and increasing the social product available for distribution.

5.1 The introduction of cognitive enhancements and the threat it poses to the basic rights and liberties

This thesis has already explained how the first principle of justice is designed to protect a fully adequate scheme or set of equal basic rights and liberties, which includes political liberties, such as the freedom to vote and participate in politics, freedom of association, freedom of thought and speech, liberty of conscience, the integrity of the person, both physical and psychological, and the rule of law. These were given special protection by Rawls, ensuring that they took priority over considerations of FEO and the distribution of socio-economic goods. The special status of these liberties was granted because of their distinct contribution to the development and exercise of the individual's two moral powers, which are central to the conception of the person as a fully cooperating member of society. By safeguarding the basic liberties, a well-ordered society provides the political and social conditions to enable citizens to assess the justice of the basic structure and develop and pursue their own conception of the good.

This section explores how the basic rights and liberties of the unenhanced class may be at risk. First, I suggest that limited access to these technologies may give rise to grave genetic and economic inequalities that distort the balance in political and economic power in society, leading to the erosion of the basic rights and liberties of the unenhanced. Second, another threat might come from a paternalistic government that enforces these enhancements in an attempt to avoid genetic inequalities.

The goal of this section is to disentangle these arguments before proceeding to explore whether they can be combated from a Rawlsian perspective.

5.1.1 Paving the way towards the erosion of the basic rights and liberties of citizens - The emergence and widening of genetic and economic inequalities.

In order to illustrate how the introduction of genetic cognitive enhancements can compromise the citizen's basic rights and liberties, let us consider the following scenario:

Access to genetic cognitive enhancements in a democratic society is unregulated, leaving its distribution to the workings of a free market economy. The acquisition of these goods will hence depend on the purchasing power of those wishing to acquire them. At this stage, an unrestricted distribution leads to the potential creation of a genetic gap between the haves and the have-nots.

The germline nature of these interventions means that these genetic differences are potentially permanent and will be passed from one generation to another, forever perpetuating the genetic inequalities between individuals. These changes to the genome may lead to the emergence of a new genetically enhanced class with superior cognitive powers that enables them to dominate the unenhanced. Drawing inspiration from the problems faced in the US by the restricted access to expensive medical care, Leon Kass provides us with a stark warning:

> *"(if) only the wealthy and privileged will be able to gain easy access to costly enhancing technologies, we might expect to see an ever-widening gap between "the best and the brightest" and the rest".*[303]

Kass is one of the most vocal opponents of genetic enhancements and headed the team charged with the creation of a report on enhancement technologies commissioned by the (now defunct) President's Council on Bioethics.[304] This report advises that extreme caution is needed when considering genetic enhancements since they will lead to a slippery slope of ethically dubious interventions that are bound to exacerbate existing social inequalities. Their concern is that human enhancement technologies will, at least in the beginning, only be available to those

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[303] Kass, L. (2003b). *Beyond Therapy, Biotechnology and the Pursuit of Happiness*. The President's Council on Bioethics, Washington DC. Page 281-282

[304] Ibid.

able to afford them. Since these will be the people who are already benefiting from existing social inequalities, the limited access to newly emerging biomedical technologies will only widen the gap between those more fortunate and those who already suffer distinct disadvantages from increasing disparities in wealth and status[305].

This line of thought is developed by dystopian thinkers such as Maxwell Mehlman and Lee Silver who take Kass's concerns even further and speculate that such interventions may lead to the creation of a form of genetic class system. Mehlman wrote about a type of genetic aristocracy (genobility) [306] where wealth, privilege and power are concentrated, and Silver warned us about the "GenRich", a genetically enhanced class with control over positions of power and the economy who would inevitably use the unenhanced class (naturals) as a workforce to further generate economic gains for their benefit alone.[307] This exemplifies a dystopian extreme that sees the unenhanced part of the population at risk of being manipulated by the enhanced minority.

Whether we accept that this restricted access may eventually lead to a new class or not, it seems inevitable that the cognitively enhanced will at least enjoy better chances in gaining offices and positions of power to some degree. The enhancement of these capacities is likely to lead to a concentration of wealth and income amongst the enhanced, resulting in access to better opportunities and a greater share of economic goods.[308]

A potential consequence of the accumulation of wealth in the hands of the few is the potential erosion of people's rights and liberties. This concern has been raised by authors such as Buchanan, Cole and Keohane, who highlighted how the distribution of innovations in general is a concern of justice because of their impact on our ability to engage in social cooperation as full members of society:

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[305] Ibid. page 317

[306] Mehlman, M. J. (1999). "Law of Above Averages: Leveling the New Genetic Enhancement Playing Field, The." *Iowa L. Rev.*, 85, 517-593. Page 533

[307] Silver, L. M. (1998). *Remaking Eden : cloning and beyond in a brave new world*, London: Weidenfeld & Nicolson.

[308] See Chapter 2 (2.2.1) where for a discussion how genetic intervention lead to better prospects.

"when powerful innovations do not diffuse widely but are only available to some, this creates opportunities for domination and exclusion."[309]

This domination and exclusion will emanate from a type of society populated by "enhanced co-operators" able to take part in rich, complex and highly productive interactions with one another whilst the unenhanced population can only engage in a "minimally competent way".[310] These enhanced co-operators may eventually have the necessary skills and economic power to manipulate and control the basic institutions so that the distribution of political and personal rights and liberties works in their favour.

The conflation of wealth and political power in Europe was infamously present in Italy under Silvio Berlusconi who held the presidential post whilst at the same time being the richest man in the country.[311] Furthermore, the historical link between wealth and political power shows how easily the political elite can be perpetuated over time. Examples of this lasting power can be found in some wealthy American dynasties, such as the Rockefeller or Carnegie families with their political influence being felt from the late 19th and still having a major role in shaping education policy in the United States.[312] The germline nature of cognitive interventions might make it even harder to break this transfer of economic and political power from one generation to another.

The control over the basic rights and liberties of the unenhanced can be exerted in a number of ways. An example can be seen in the use of political lobbying which enables people to further their own agenda. It is not unusual that those with the right skills and sufficient money dedicate their time to petitioning and influencing politicians for particular causes by shaping ideology or funding political parties that strongly align with their own interests. The result, in some cases, is that policies are

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[309] Buchanan, A., Cole, T. and Keohane, R. O. (2011). "Justice in the Diffusion of Innovation." *Journal of Political Philosophy*, 19, 306–332. 2009, Page 306

[310] Ibid. Page 307

[311] Rossi, M. (2011). "Wealth and political power: Evidence from the foundation of Buenos Aires." *Buenos Aires, Argentina: Universidad de San Andrés. Mimeographed document*.

[312] MacEwan, A. (2013). "The wealth-power connection." *Capitalism on Trial: Explorations in the Tradition of Thomas E. Weisskopf*, 123.

developed in a way so that the basic structure of society is governed without the input of those with fewer economic resources leading to the eventual marginalisation of the interests of those who need most support in society.

This gradual undermining of the basic rights and liberties of the less well off may be compounded by the growing reluctance of those with fewer genetic and economic resources to make effective use of the formal rights that they still have. Feeling betrayed by society, citizens are left wondering whether it is still worthwhile for them to carry out the civic activities that might lead to an improvement of their position in society. Suspecting that the system is rigged in favour of the privileged class, they stop exercising their right to vote or participate in political debate. In short, their sense of political efficacy has been damaged in a way that they stop being part of the democratic process. The reason we care about political efficacy is because it directly affects how and whether citizens make use of their political rights. This idea was first introduced in the 1950s by Campbell et al.[313] when investigating the reasons and motivations behind people's political involvement:

> *"The sense of political efficacy may be defined as the feeling that individual political action does have, or can have, an impact upon the political process, i.e. that it is worthwhile to perform one's civic duties. It is the feeling that political and social change is possible, and that the individual citizen can play a part in bringing about this change."*[314]

When the feeling that change can be possible through political action disappears, citizens stop making use of their political rights and liberties and become complicit with the wealthy classes in paving the way towards achieving a basic structure that disadvantages the less well off.

Socio-economic inequalities are seen to be one important contributing factor in the decrease of the sense of political efficacy. The link between political participation and socio-economic status has been widely discussed in the economic literature with the pioneering 1937 work by Tingsten[315] becoming the main point of reference.

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[313] Campbell, A., Gurin, G., and Miller, W. E. (1954). "The voter decides."

[314] Ibid. Page 187

[315] Tingsten, H. (1937). *Political behavior: Studies in election statistics*: PS King.

Tingsten's work argued for a strong positive correlation between political participation and socio-economic status. These findings have been confirmed by more recent research, for example the study carried out by Frederik Solt[316] where he analyses the relationship between inequality and political engagement across 12 of the world's richest democracies. Solt's conclusion is that those countries with greater economic inequalities tend to have lower levels of political engagement, including election participation, political debate and interest in politics in general. Furthermore, this depressed political participation becomes more pronounced as relative income declines and within those groups with lowest shares of wealth. If lower levels of political participation decrease as economic inequalities increase and if the political participation of the least advantaged is most adversely affected, there is a strong argument to control any potential inequalities caused by the introduction of genetic cognitive enhancements.

There is also a danger that, once we stop exercising our political rights and our political liberties gradually lose their significance, our personal liberties such as freedom of conscience, association and non-political speech, will also be affected as a result. In order to be able to choose, pursue or make changes to our own way of life, not only do we need to make use of our personal liberties, we also need to be able to live under laws that allow and support its pursuit. Political liberties when equally guaranteed to all, enable individuals to shape institutions so that everyone can enjoy and exercise their personal liberties and subsequently have the freedom to pursue their chosen life plan.

Bringing the discussion back to the potential introduction of genetic cognitive enhancements, the unequal access to these technologies can play a role in the causal chain that leads to the concentration of power in the hands of the enhanced few as just described:

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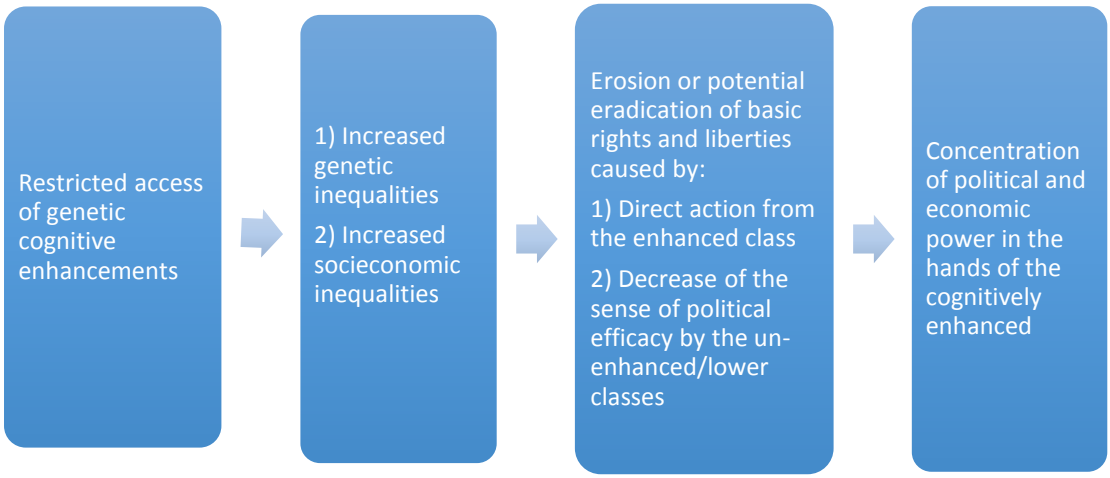
[316] Solt, F. (2008). "Economic inequality and democratic political engagement." *American Journal of Political Science*, 52(1), 48-60.

Figure 1: A causal pathway towards the accumulation of power by the enhanced



So far, I have outlined how the concentration of power in a genetically enhanced elite might erode the basic rights and liberties of a genetically unenhanced class. I will now consider a second way that the introduction of genetic cognitive enhancements might undermine basic rights and liberties. A paternalistic, benevolent government with an egalitarian ethos may foresee the dangers of inequality posed by the introduction of cognitive genetic enhancements and seek to solve the problem by 'levelling up' the genetic endowments of future citizens. The goal of this policy would be to ensure that those with lesser intellectual powers were not disadvantaged when competing for jobs, positions of power and economic resources.

This levelling up, in order to work, would necessarily involve compulsory manipulation of genome of the offspring of those individuals with any deficits in cognitive talents. Since we are dealing with genetic interventions that are designed to increase these natural capacities I will ignore for the purpose of this discussion the possibility that a government could have the means to thwart the genetic potential of individuals and opt for a "levelling down" strategy instead. In this thesis I only deal with interventions that result in an increase in the level of normal functioning and this is how the term enhancement is used throughout.

In an attempt to protect the political rights and liberties of individuals this paternalistic government would however be jeopardising its citizens' personal

rights and liberties.[317] This enforced genetic intervention will particularly put at risk the personal integrity and procreative liberty of those parents who would not have voluntarily chosen to modify the genetic make-up of their future offspring. In discussions surrounding procreative freedom and how it is permissible to limit such a liberty, it is generally acknowledged that this liberty takes priority unless a high degree of harm is caused by not intervening. As John Harris explains:

> *"Those who would exercise reproductive liberty do not have to show what good it would do, rather those who would curtail freedom have to show not simply that it is unpopular, or undesirable, or undesired, but that it is seriously harmful to others, or to society, and that these harms are real and present, not future and speculative."*[318]

This kind of social policy not only is controversial but also deeply troubling and reminiscent of the compulsory eugenic policies already discussed in this thesis.

5.1.2 Societal unrest leading to instability

As a result of having their basic rights and liberties diminished, the ability of citizens to fully participate in society in their role as citizens is immediately compromised. Frustrated by their inability to contribute as equal citizens in shaping the social and economic policies of their country, some people are likely to feel let down by the ruling government and society in general. Consequently, a society unable to protect

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[317] I am only concerned with the reproductive rights of the parents. Although there is an interesting discussion to be had regarding the issue of harming the future child. The basic rights of liberties of future citizens are only considered from a Rawlsian perspective assessing whether these interventions will harm their two moral powers and therefor their ability to fully function as citizens.

For an interesting discussion expanding on how basic rights and liberties of future citizens see Loi, M. (2012). "On the Very Idea of Genetic Justice." *Cambridge Quarterly of Healthcare Ethics*, 21(01), 64-77. Michelle Loi discusses the permissibility of genetic enhancements under the assumption that the embryo is not considered a person and as such its personal integrity cannot be damaged by genetic interventions. An argument against genetic interventions based on their threat to the sense of identity and instrumentalisation of future persons is widely discussed by Habermas in Habermas, J. (2003). *The future of human nature*: Blackwell Pub.

[318] I follow Harris's defense of reproductive freedom as a negative right that takes priority over most other concerns and protects parents against the imposition of governmental constraints on their reproductive choices. Harris, J. (2005). "Reproductive liberty, disease and disability." *Reproductive biomedicine online*, 10 Suppl 1, 13-6. Page 13

the basic liberties and opportunities of its citizens as a result of unequal access to cognitive enhancements may face societal disruption.

The unenhanced population could become disenfranchised as they find themselves with diminished access to healthcare, legal representation and positions of power, whether economic or political.[319] Their growing sense of detachment may eventually lead to social revolt and uprising, which endangers the stability of society. The political instability of a given society is assessed by the propensity of its government to change at a constitutional level or, at its most extreme, collapse.[320] It has been shown that one of the factors leading to increased political instability is income inequality.[321] As Alesina et al. argue:

> *"A large group of impoverished citizens facing a small group of well off individuals is likely to become dissatisfied with the existing socio economic status quo and demand radical changes, so that mass violence and illegal seizure of power are more likely than when income distribution is more equitable."*[322]

If the basic liberties of the unenhanced population have been progressively eroded or virtually eliminated either by the wealthy few, or by a government implementing compulsory genetic modification measures, their resentment towards the political system will only increase and may lead to an uprising. Although a complete collapse of the political system may seem alarmist, it can be claimed that we need only look at the recent Arab uprising caused, amongst other reasons, by the widespread discontent with the economic hardship and social injustices endured by a large section of the population.[323]

Conversely, countries where political initiatives have been launched to reduce inequalities after a period of unrest are shown to be more stable than other

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[319] Allhoff, F., Lin, P., and Steinberg, J. (2011). "Ethics of Human Enhancement: An Executive Summary." *Science and Engineering Ethics*, 17(2), 201-212.

[320] Alesina, A., and Perotti, R. (1996). "Income distribution, political instability, and investment." *European economic review*, 40(6), 1203-1228.

[321] Ibid.

[322] Ibid. Page 1214

[323] Salih, K. E. O. (2013). "The roots and causes of the 2011 Arab uprisings." *Arab Studies Quarterly*, 35(2), 184-206.

countries with similar economic growth.[324] This seems to be the case with countries in South East Asia with reduced levels of income and wealth inequality after WWII and higher levels of stability when compared to Latin American countries.[325]

If widening economic inequalities are allowed as a consequence of unrestricted access to genetic cognitive enhancements, governments will need to have appropriate strategies to deal with the instability that can ensue.

5.2 Rawlsian response for ensuring the protection of basic rights and liberties

In the face of the potential threat that cognitive genetic intervention can pose to basic rights and liberties, I now evaluate whether the well-ordered society governed by Rawlsian principles can ease these worries through the application of the first principle of justice and the protection given to the worth of political liberties.

In line with the reasoning presented in the previous section, Rawls also believes that economic and social inequalities go hand in hand with unequal political power. The Rawlsian theory of justice echoes the concern presented in this chapter that economic inequalities can lead to an erosion of political liberties.

Rawls believes that socio-economic inequalities are to be controlled in order to prevent one part of society from accumulating large political power and using it to dominate those with fewer resources:

> *"This power allows a few, in virtue of their control over the machinery of the state, to enact a system of law and property that ensures their dominant position in the economy as a whole. Insofar as this domination is experienced as a bad thing, as making many people's lives less good than they might otherwise be, we are again concerned with the effects of economic and social inequalities."*[326]

As I have shown, if left unchecked, this diminished economic and political power may endanger the individual's ability to engage in social cooperation, and could even affect their equal share of the basic liberties and opportunities protected by a

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[324] Alesina, A., and Perotti, R. (1996). "Income distribution, political instability, and investment." *European economic review*, 40(6), 1203-1228. Page 1226

[325] Ibid. Page 1228

[326] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 131

Rawlsian conception of justice. It is important, therefore, that the Rawlsian principles of justice are supported by a legislative framework designed to prevent the erosion of these key primary goods.

Recall how the first principle of justice, as defined by Rawls, protects the basic political and personal liberties of citizens. This principle was designed to ensure that citizens enjoyed a fully adequate scheme of liberties which was, at the same time, compatible with the same scheme of liberties enjoyed by all. Furthermore, there are two aspects of the Rawlsian political conception that emphasize the important place they have in his theory. First, the protection of these liberties will always take priority over the distribution of economic goods. Second, the political liberties in particular must have their fair value guaranteed. The following sections are designed to explain each of these components of the Rawlsian theory and how they will help to address the concerns relating to the threat that genetic cognitive enhancements might pose to basic rights and liberties.

5.2.1 Priority of the first principle of justice

One of the key aspects of Rawls's theory supports the protection of basic rights and liberties against the socio-economic inequalities created by genetic cognitive enhancements. This protection is strengthened by the priority he assigns to this scheme of liberties over the second principle of justice and therefore over considerations of opportunity and distribution of economic goods.

The individual liberties of said scheme work together as part of a comprehensive system. No liberty is supposed to be absolute and there will be times when one liberty conflicts with another. When this happens, individuals' liberties may need to be adjusted so that the best possible protection is given to the development and the exercise of the citizens' two moral powers. It is the whole scheme of liberties overall that has priority over considerations of opportunity, distribution of economic resources or other aspects relating to the particular notions of goodness or teleological doctrines held by individuals:

> *'The priority of liberty implies that a basic liberty can be limited or denied solely for the sake of one or more other basic liberties, and never, as I have said, for reasons of public good or perfectionist values."*[327]

The priority of the principle of equal liberty is always required except when "reasonably favourable conditions"[328] in society are not met. These conditions are not fully specified by Rawls. Rather, they are broadly defined as those conditions that allow the effective establishment and exercise of said liberties. The reader gets a flavour, even if not fully stipulated, of what these conditions might look like. For example, Rawls writes that favourable circumstances will be those where an adequate level of economic advance is present and the society has the relevant experience and skills to run basic institutions. Where we have societies with levels of extreme poverty and/or unstable or unelected governments, it might be necessary to restrict certain liberties until the basic needs of the population are met.

Whenever reasonably favourable conditions are met, however, no liberty is to be sacrificed for the sake of other goods. This means, for example, that should significant economic gains be had by denying a religious group certain political rights, the Rawlsian political conception will explicitly forbid such a move. A government might prevent this type of attack on liberties from happening, say with the development of antidiscrimination laws precluding anyone from being treated unfavourably because of their race, economic status, genetic make-up or adherence to a particular (reasonable) comprehensive view. This would be the appropriate measure to take in a democratic society that is governed by the principles of Rawlsian justice.

First, I consider how this priority might work in the case where restricted access to these technologies leads to a situation where the enhanced part of the population harmed the political liberties of the unenhanced. Under the auspices of the first principle of justice, any potential attack on the right to political participation of the unenhanced would be curtailed by appropriate anti-discriminatory legislation. A society ruled by the first principle of justice would encourage and enact legislation

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[327] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 295

[328] Ibid. Page 297

to prevent any type of genetic discrimination in the same way that protection is offered to citizens on account of their race, religion or gender. The priority of the first principle of justice would guarantee the protection of rights and liberties even when their restriction resulted in a much higher social product. It might be argued that, given the priority that Rawls gives to basic rights and liberties, a simpler solution could be to completely ban these technologies. However, this would entail unnecessarily forfeiting altogether the potential benefits these technologies might bring. To elucidate this point, let us consider the way Rawls deals with potential challenges linked to one of the key primary goods - wealth. The dangers posed by the unfettered accumulation of wealth are addressed by appropriate regulation via the principles of justice rather than the complete elimination of wealth accumulation. Eliminating wealth would mean that the generated social product benefiting the least advantaged would also completely disappear. The Rawlsian conception however, protects the citizens' rights and liberties and at the same time enables citizens to use the benefits generated by these goods as long as they benefit the least advantaged.

Second, should the attack on liberties come from an attempt by the government to equalise genetic endowments, the same liberty protecting principle would apply. In this case these intrusive genetic interventions would be prevented by an appeal to the citizen's personal or civil liberties and how these override any governmental concerns of achieving genetic equality. Although Rawls did not specifically address issues of reproductive freedom or the right to have a family , the protection of these rights was, I believe, nonetheless implied. As James Nickel points out the so called "Lifestyle Rights"[329] are omitted from Rawls's list even though these are included in most contemporary bills of rights. Part of these lifestyle rights would involve the freedom to found a family which would include procreative freedom within its scope. Now, it may be that Rawls did not specifically mention this liberty since it could be considered to fall under the umbrella of "freedoms specified by the liberty and integrity of the person".[330] This would mean that procreative freedom is

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[329] Nickel, J. W. (1993). "Rethinking Rawls's Theory of Liberty and Rights." *Chi.-Kent L. Rev.*, 69, 763. Page 770

[330] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 291

"structurally protected"[331] by the rights safeguarding the freedom and integrity of the person. Given the importance to tolerance and the protection that Rawls affords to diverse comprehensive views, it is very plausible that the broad concept of Rawlsian liberties is meant to include the citizen's reproductive rights. Furthermore, as part of his justification for basic liberties, Rawls relied on their special role for the development of the citizen's two moral powers. Let us recall that primary goods (including basic rights and liberties) were chosen since they were deemed necessary to develop these capacities. Having the freedom to choose how and under what circumstances to procreate seems to be an important aspect of being able to realise our very own conception of the good. This is particularly important if part of that conception of the good involves having a family. Reproductive choices are significant decisions that individuals make about the kind of life they want to lead; having these decisions made by others would mean curtailing the exercise of their second moral power.

The objection to intrusive reproductive policies does not arise out of a concern for the foetus. Rather, Rawls would argue that the rights of the parents as citizens are being violated. Rawls does not talk about the status of the foetus with his theory being focussed on the principles applying to citizens with the two moral powers as they engage in social co-operation. Since foetuses cannot be said to possess the moral powers as understood by Rawls, any Rawlsian justification prohibiting forceful implementation of genetic enhancements would presumably need to be grounded in the rights of parents. However, from a Rawlsian perspective we also need to be aware of the obligations we hold towards future citizens. From a Rawlsian perspective, the government might be entitled to intrude in the procreative liberty of its citizens if there was a danger that the future children's status as morally equal agents was being compromised by the reproductive choices of their parents. Children, according to Rawls, are presumed to have rights as prospective citizens.[332] Parents therefore must respect the rights that their children have to appropriately develop their two moral powers. Respecting their offspring's

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[331] Nickel, J. W. (1993). "Rethinking Rawls's Theory of Liberty and Rights." *Chi.-Kent L. Rev.*, 69, 763. Page 771

[332] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 11

citizen rights would include ensuring that they are not deprived of essential medical care or basic education. However, the genetic interventions considered here would take the level of cognition beyond that necessary to the development of the two moral powers. This being the case, the government would not be justified in forcefully intervening in the genome of future children by appealing to the protection of their future moral status.

The priority given by Rawls to basic rights and liberties ensures that those unable to access these technologies will not have their political or civil liberties undermined either by the enhanced few or by a paternalistic government aiming to equalise genetic talents. These rights are here protected in a formal way. However, Rawls believes that formal protection may not be enough. Protecting the actual exercise of these liberties, in particular political liberties, will ensure that citizens are able to exercise them if they should wish. This drives Rawls to ensure that the worth or fair value of political liberties is safeguarded.

5.2.2 Fair value of political liberties

Rawls has consistently maintained that both sets of political and personal or civil liberties are of equal weight, albeit they sometimes have different roles in developing two distinct aspects of the autonomy of individuals. These different roles are reflected in the distinction between the public and private aspects of autonomy which are themselves linked to the two separate moral powers of citizens:

> *'The liberties of both public and private autonomy are given side-by-side and unranked in the first principle of justice. These liberties are co-original for the further reason that both kinds of liberty are rooted in one or both of the two moral powers, respectively in the capacity for a sense of justice and the capacity for a conception of the good."*[333]

Public autonomy relates to how we conduct ourselves within the sphere of the political through the exercise of our sense of justice and making use of our political liberties. Our personal autonomy is characterised by how we conduct our lives within our comprehensive worldview and it is aided by the use of our personal

[333] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 413

liberties in order to form, revise and pursue our conception of the good. Political liberties, although having their biggest role in the sphere of public autonomy, also contribute to how successful people are in the development and pursuit of their private ends. The freedom to pursue our life plan will depend in part on our ability to shape policies that provide the conditions to pursue it.

Whilst still maintaining the co-dependence and co-existence of both sets of liberties, Rawls argues that the political liberties, and only they, must be guaranteed their fair value by giving them special status:

> *"This guarantee means that the worth of the political liberties to all citizens, whatever their economic or social position must be sufficiently equal in the sense that all have a fair opportunity to hold public office and to affect the outcomes of elections, and the like."*[334]

This special status arises from the role that political liberties have in establishing, securing and maintaining the basic institutions. In particular, these liberties are considered essential for the establishment of just legislation through a process that is open to everyone on the basis of equality.[335] Having protected the priority and equal distribution of the full scheme of basic rights and liberties, Rawls is concerned that the equality of political liberties in particular may turn out to be merely formal unless further constitutional protection is granted. This concern parallels Rawls's move in *A Theory of Justice* from formal to fair equality of opportunity. In fact, the special status given to political liberties is rooted in very similar reasons; the difference now is that he is seeking to guarantee that citizens have a fair chance to hold public office and participate and influence political decisions.

Rawls believed that "the worth or usefulness of liberty is not the same for every individual".[336] This is because existing differences in wealth and income equip citizens with different means to exercise these liberties. Even though the difference principle has been designed to regulate and minimise allowable economic inequality, Rawls fears that this might not be enough to ensure that political liberties

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[334] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 149

[335] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 330

[336] Ibid. Page 326

are not merely formal. Additional measures will need to be put in place. These measures may require that legislation is developed to secure that political parties are financially independent, elections are publicly funded and that a public facility is established to guarantee fair and equal access to the political process.[337] Furthermore, from a Rawlsian perspective the citizen's moral agency risks being damaged by not giving adequate protection to their political liberties. Without the ability and opportunity to make use of political liberties in more than a restricted formal sense, we might be placing restrictions on their capacity to exercise their sense of justice.[338] Protecting these liberties enables citizens to better participate and deliberate on political matters. As they engage in political deliberation they have the opportunity to justify their beliefs publicly in ways that others can accept. Moral agents who, as per Rawls's definition, already possess a capacity for a sense of justice to an appropriate level will now have access to the right political space where they can exercise and develop this moral power.

Looking back at the threat to the sense of political efficacy and the ever decreasing level of political participation that disparities in access to genetic cognitive enhancements can cause, it is not difficult to see how the measures that Rawls had in mind might be important. The institutional protection that is given to everyone's political liberties publicly expresses the equal value of everyone's participation in political activity regardless of their economic position or, in our case, their genetic make-up. Whatever feelings of detachment and disillusionment that the unenhanced class might feel, will be lessened by the knowledge that society considers their rights to be of equal value regardless of their genetic make-up. This will serve: first, as reassurance that they share the same equal moral worth as the enhanced

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[337] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 150

[338] Wall argues that the sense of justice may be develop in ways other than political participation such as through parental influence and social and working environments. This is indeed true and it is reflected in Rawls's exposition of moral development explored in Chapter 6. For this discussion I am interested in how the development of a sense of justice can be protected at an institutional level.

Wall, S. (2006). "Rawls and the status of political liberty." *Pacific Philosophical Quarterly*, 87(2), 245-270. Page 255

population; and second, as an encouragement to make use of their political rights in the knowledge that their voices will be heard.

5.3 Genetic cognitive enhancements and their impact on opportunity

Chapter 4 explored how higher levels of natural cognitive capacities influenced the range of available opportunities giving rise to higher life prospects and access to advantages. The introduction of genetic interventions would mean that we could intervene into these natural capacities and enhance them, subsequently also affecting the level of opportunities of individuals. In this section I specifically explore how the use of genetic cognitive enhancements could negatively impact or jeopardise opportunity.

5.3.1 Widening socio-economic inequalities and narrowing access to jobs and positions of power and responsibility

Genetic interventions may give rise to huge variations in cognitive abilities, thereby potentially compromising access to powers and positions of responsibility for unenhanced individuals. This will restrict their life chances and subsequently their access to socio-economic goods. The improved capacities of the enhanced citizens will improve their competitiveness for higher paid positions and increase their share of socio-economic goods, extending the gap between the haves and the have-nots. This competitive edge will be particularly felt in the job market. Candidates with improved genetically modified information processing faculties may consistently do better at job selection tests, interviews and entry tests to elite universities. For instance, enhanced information processing skills may prove very valuable to, for example, a lawyer, when it comes to evaluating the complex details of a court case. This would most likely give her a distinct advantage over colleagues who need to rely on their more basic natural endowments.

This competitive advantage does of course also happen naturally without the need of any genetic intervention. However, even though naturally occurring variations in natural capacities give people some competitive edge over others, the differences in competitive levels may be greater where enhancements come into play. I have previously hypothesized that the initial high market value of these technologies means that their acquisition may be, at least temporarily, restricted to the wealthy.

Since their offspring are likely to also benefit from better educational resources, these enhancements will further increase their chances of success compared to those being born into families with fewer economic resources. Furthermore, a system where access to genetic interventions is determined by the purchasing power of individuals will reproduce existing inequalities over time in two distinct ways. First, the higher level of cognitive performance will be perpetuated between those cognitively enhanced, since the trait is inherited from generation to generation. Second, the higher socio-economic goods gained as a result of the improved competitive position in attaining well paid positions will also be passed to their future offspring.

As a consequence, this restricted access to positions of power and higher paid jobs might entrench the socio-economic position of the least advantaged and compromise both generational and inter-generational social mobility. Poor access to non-genetic cognitive enhancements in the form of educational goods is already known to negatively affect social mobility and the levels of income and wealth of those in the lower socio-economic classes. Research shows that access to high quality education in modern democracies is often linked to the level of income of parents. Children of high earners not only inherit their parents' wealth, but are also more likely to be more highly paid in their future jobs than children raised in low paid families.[339] Corak highlights this point in his evaluation of intergenerational inequalities in the United states:

> *"Someone born to parents with low income faces a higher risk of less successfully transiting through these stages and of ending up in a precarious labor market situation, which in turn diminishes his or her capacity for positive parenting. This raises the odds of a generational cycle of poverty, but money is as much the result as the cause of the vicious circle."*[340]

The stages that Corak mentions in this passage begin in the early life of the child and they include cognitive, social, emotional and language development stages as key

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[339] https://www.equalitytrust.org.uk/social-mobility-and-education

[340] Corak, M. (2012). "Inequality from generation to generation: The United States in comparison". City. Page 4

determinants of their educational achievement, labour market success and their socio-economic status. Children's developmental outcomes and their eventual status in society as adults are all confounded, Corak claims, by rigid public policies, the internal workings of the family and the rigid structures of the labour markets.[341] All these environmental factors make a profound contribution to the perpetuation of economic inequalities across generations. The relationship between income inequality and lower levels of intergenerational mobility has been widely studied and it is commonly known as the Great Gatsby Curve. This upward sloping curve plots the Gini coefficient (income inequality) against the intergenerational income elasticity graded from 0 to 1. The closer to zero the smaller the correlation between the parent and the child's future income. An example will perhaps best illustrate the meaning of this index. A recent study carried out by the OECD quoted an income elasticity of 0.50 in the UK in 2014.[342] It has been shown that developed countries with high income inequalities, such as the UK and the USA show much lower levels of intergenerational mobility in earnings than, for instance, the Nordic countries where earnings are more evenly distributed.[343] Adding the restricted availability of genetic enhancements to this mix is likely to exacerbate this generational cycle of poverty.

The range of opportunities available to the unenhanced may also be compromised by the power that the enhanced class might acquire in the area of policy making. The impact of access to positions of power by the talented alone and how it affects public policy making is clearly explained by Iris Young.[344] Those occupying social positions of power will have greater opportunities – as social, economic and political decision-makers- to influence the fate of everyone else in society. As explained in the previous section, we should not only worry about whether those with the appropriate talents access certain positions but also how that can influence the lives of those whose lack of ability precludes them from occupying positions of power.

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[341] Ibid.

[342] Cingano, F. (2014). "Trends in income inequality and its impact on economic growth."

[343] OECD. (2011). "Divided We Stand: Why Inequality Keeps Rising. Organization for Economic Coopera- tion and Development.". City: OECD Publishing: Paris.

[344] Young, S. P. (2006). "Rawlsian Reasonableness: A Problematic Presumption?" *Canadian Journal of Political Science*, 39(01), 159-180. Page 94

Focusing on the educational system in particular, Young highlights the wide ranging effect of the concentration of decision making powers in the hands of a few:

> *"often a small number of people make decisions that affect many participants in an institution and outside it. Educational institutions constitute decision-making power about curriculum and student performance evaluation, for example, which affect students, teachers, and parents in significant and often far-reaching ways."*[345]

How education is made accessible to citizens and the content and delivery of educational resources will determine how well equipped citizens are to access and secure positions in open competition. For example, the provision of expensive education for our children results in the ability to access careers that generally yield higher economic returns and access to positions of power. Furthermore, if the decisions about educational content and educational access are dominated by the enhanced class, the interests of those with fewer cognitive capacities may be ignored.

The introduction of genetic cognitive enhancements might, if left unchecked, exacerbate and increase socio-economic inequalities across generations. Furthermore, these inequalities may be further entrenched by the transfer of decision making powers to the enhanced classes. Their influence on existing socio political frameworks may fail to safeguard the interest of all members of society, creating a society where opportunities are no longer open to all.

5.3.2 Market stimulus and trickle-down effect insufficient to avoid increasing socio-economic inequalities.

The initial high entry price usually attached to new advances in technology is likely to prevent some parts of society from accessing these genetic interventions. Some have argued, however, that this initial exclusion may eventually be to the benefit of those worst off in society. Leon Kass himself seems to acknowledge that even though access to these technologies may at first be restricted to the rich, the poorer classes will also get to reap the benefits:

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[345] Ibid.

> *"To be sure, the gap between the richest and the poorest may increase, but in absolute terms the poor may benefit more, when compared not to the rich but to where they were before."*[346]

Despite his warnings against the rise of new biotechnologies, Kass seems to accept the "trickle-down" theory often used to justify economic inequalities where the benefits derived from the accumulation of wealth amongst the privileged will in time flow down to the lower classes.

However, how does this benefit transfer from rich to poor actually work? One plausible answer resides in the market stimulus mechanism. According to this hypothesis, genetic cognitive enhancements will first be subsidized by the wealthy and also for a time after their introduction whilst very small incremental improvements are made to reach optimal performance. However, once this period is over, we will have a better version of the technology with a price that will decrease in proportion to the increase in demand for the technology. As time goes by, the wealthy will have paid for the quality improvements of the technology without fully reaping the benefits of their investment. This, Naam[347] explains, is because of the way high-end technologies, including biotechnological enhancements obey a law of diminishing returns:

> "That is to say that someone who can spend 10 times as much on an enhancement isn't going to get 10 times the result." [348]

Those most privileged would have paid a premium price for products that were new and innovative at the time but, undoubtedly, of a much lesser quality than those currently available to the majority of the population.

The last 100 years have provided us with examples of how this restricted access eventually disappears with the use of new expensive commodities becoming

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[346] Kass, L. (2003b). *Beyond Therapy, Biotechnology and the Pursuit of Happiness*. The President's Council on Bioethics, Washington DC. Pages 317-318

[347] Naam, R. (2005). *More than Human, Embracing the Promise of Biological Enhancement*: Broadway Books/Random House , page 55

[348] I recognize that the availability of these items is not widespread worldwide and my claim refers largely to the supply and demand of the aforementioned items in modern western democracies as envisaged by Rawls when he developed his model for "justice as fairness"

commonplace. Looking at IT and communications technologies, it was not that long ago owning a computer or a mobile phone was only affordable to those with the highest disposable income. However, statistics now show that PC ownership in the UK has risen from 13% in 1985 to 80% in 2011. Likewise, 86% of the UK population owned a mobile phone in 2011 compared to the 20% recorded in 1997[349] and 58% in 2000. This increase in ownership has come alongside, and it is very likely to be caused by, a substantial price reduction in these technologies. Crozier and Hajzler[350] explain how this phenomenon can be best illustrated with the Apple II PC which came into the market in 1977 at a price of $1,300. Adjusting for inflation that same PC would now have been priced at approximately $4,500. Nowadays, however the price for a standard PC is around $1,000. Were we to also adjust for the huge quality improvements in technology that have occurred since 1977, the revised "quality adjusted"[351] price would likely turn out to be much lower than $1,000.

If the introduction of genetic enhancement technologies is to follow the same pattern, the cost of genetic interventions is likely to be prohibitive to most of us at launch and for as long as the patent is in place. Looking at the price history of human genome sequencing there are empirical reasons to assume that the price of genetic interventions will decrease as technology improves. Back in 2003 the cost of sequencing a single human genome was $2.7bn, dropping to $5,000 in 2013 with companies currently being able to offer this service at a cost of $1,000 and promising to bring this down to just $100 in the future.[352]

Nevertheless, the empirical validity of the market process eventually bringing this "trickle-down' effect whereby the benefits are eventually passed to all socio-economic groups, has been recently put into question. Whereas the accumulation of

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[349] Statistics, O. f. N. (2010). *General Lifestyle Survey Overview*. Office for National Statistics. Page 43

[350] Crozier, G. K. D., and Hajzler, C. (2010). "Market Stimulus and Genomic Justice: Evaluating the Effects of Market Access to Human Germ-Line Enhancement." *Kennedy Institute of Ethics Journal*, 20(2), 161-179.

[351] A quality adjusted price takes into account quality changes of a product. For example in the case of the PC we would take into account the improvements in functionality over the years (when compared to their baseline point of reference) to calculate their real price.

[352] Herper, M. (2017). "Illumina Promises To Sequence Human Genome For $100 -- But Not Quite Yet "*Forbes*. City: Online publication.

capital among the wealthy few in 1950's America seemed to go hand in hand with steady increases in income and wellbeing across the rest of the population, recent increases in income inequalities are putting into doubt this supposed correlation. Recent research suggests that, often, economic growth does not significantly reduce poverty levels,[353] and income transfers are more often and prominently happening from the poor to the rich rather than vice versa.[354] This income transfer can take various forms including the consumption of goods supplied by multinational companies or governmental taxation that goes toward the provision of public services entirely supplied by wealthy private institutions. Furthermore, inequalities in income distribution seem to be giving way to a "negative trickle-down effect"[355] characterised by a decrease in expenditure in public goods and prohibitive increases in the price of housing for low and middle income people to name but a few examples. The current housing crisis experienced by many western developed countries is a case in point. The profits generated by "bricks and mortar" in the last two decades prompted high levels of property development that made house prices unaffordable not only to the least advantaged but also to the those traditionally considered as belonging to the middle class. Although salaries were increasing, unprecedented growth in property development in the market meant that house prices were increasing at a much faster rate, making the purchase of property unaffordable. Alongside this housing crisis, the increase in private wealth of those most powerful creates a pressure on governments to reduce taxation. This inevitably leads to a decrease in expenditure in essential public services such as health and education, which is bound to affect those with fewer resources most significantly. The wealthy class can afford private healthcare and private education for their children; those struggling with low incomes will be the ones who suffer.

Despite the possibility that these newly emerging technologies may eventually be made available to most in society, the empirical evidence against the transfers of

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[353] Thornton, J. R., Agnello, R. J., and Link, C. R. (1978). "Poverty and economic growth: Trickle down peters out." *Economic Inquiry*, 16(3), 385-394.

[354] Akinci, M. (2017). "Inequality and Economic Growth: Trickle Down Effect Revisited." *Development Policy Review*.

[355] Greenwood, D. T., and Holt, R. P. (2010). "Growth, inequality and negative trickle down." *Journal of Economic Issues*, 44(2), 403-410.

wealth and opportunities to those who most need them warrants caution and demands the development of mechanisms to avoid an increase in the gap of socio-economic differences and the further marginalisation of the lower classes. The next section aims to demonstrate that the application of the Rawlsian FEO and the difference principle provides the necessary safeguards to stop the introduction of genetic cognitive enhancements from resulting in increased socio-economic inequalities and restricted access to opportunities.

5.4 A Rawlsian response to the potential threat to opportunity from the introduction of genetic cognitive enhancements

The protection that Rawls gives to opportunity is captured within the principle of FEO. Working alongside the difference principle, Rawls has at his disposal the necessary tools to address the impact that differentials in natural talents have on life prospects.

Before embracing genetic cognitive enhancements as part of the Rawlsian theory, we must ensure that they do not present a danger to the life prospects that Rawls is trying to protect through his second principle of justice. This section first provides an overview of how Rawls protects opportunity using both parts of the second principle of justice. Next, I evaluate whether the FEO and difference principles are able to deal with the potential challenges posed by the introduction of genetic cognitive enhancements. I finish by suggesting that these challenges would not be a concern in a society governed by the Rawlsian principles of justice and that they could even contribute towards the equality and reciprocity goals of the theory of justice.

5.4.1 The FEO principle and the difference principles as custodians of the life prospects of individuals

The protection of opportunity or life chances is at the core of Rawls's second principle of justice.

The second part of this principle, the FEO principle, states that "those who have the same level of talent and ability and the same willingness to use these gifts should have the same prospects of success."[356]

The principle of FEO was devised by Rawls as a mechanism to minimise the effects that morally arbitrary social factors had in people's access to jobs and positions. As explained in Chapter 4, this is what motivated Rawls's move from a mere formal equality of opportunity to a fair equality of opportunity model.

By demanding that advantages are determined by the individual's natural talents and motivations, Rawls is essentially removing the effect that morally arbitrary social contingencies have on citizens' life chances. Access to opportunities must be such that they track differences in natural ability and motivation alone. As a result, those inequalities caused by social conditions are virtually eradicated. Protecting FEO enables individuals to benefit from social cooperation including the acquisition of primary goods such as, powers, income and wealth.

Rawls is concerned with the chances for people to access opportunities rather than assuring they have equal success pursuing these opportunities. It is important however, that people's prospects are real prospects, and this is what should guide the design and governance of basic institutions. Institutions will need to be arranged so that they secure "equal chances of education and culture for persons similarly endowed and motivated" as well as "equality of opportunity in economic activities and in the free choice of education."[357] Furthermore, there should be no excessive accumulations of wealth of property [358] as these would threaten access to opportunities by all.

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[356] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 44

[357] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 275

[358] Ibid. Page 73

Controlling for these social contingencies will require a number of measures that go beyond the formal protection given to opportunity, through the removal of legal barriers based, for example, on gender, religion or ethnicity. Briefly, measures also need to be in place so that citizens have a good chance to attain the positions available to them. In order to guarantee access to educational goods, Rawls endorses some sort of publicly funded education[359] to allow children to compete on fair terms with each other.[360] This education may well be provided by the private sector as long as institutional measures are in place to ensure wide access. Provision of basic healthcare to ensure that citizens can function as fully cooperating members of society is also granted under the scope of the FEO principle. Rawls has been notoriously vague in outlining the details of these measures, but he has acknowledged that a basic healthcare provision is to be assumed.[361] A Rawlsian conception of justice will therefore ensure the availability of appropriate educational, cultural and basic healthcare resources to enable citizens to have a fair go at pursuing those ends that are commensurate with their talents.

As it stands, the Rawlsian FEO will prevent two discriminatory practices that might arise with the introduction of genetic cognitive enhancements. First, those genetically enhanced could be considered to be "freaks" and discriminated in the same manner that minorities or people with disabilities have suffered and continue to suffer in some cases. They might, for example, face discrimination in the labour market. Feeling threatened by their superior cognitive abilities, organisations might include a requirement to declare whether the potential candidate has been genetically enhanced and purposefully exclude them from the shortlisting process. Conversely, this discrimination can affect the unenhanced class for very different reasons. Expecting that those who are genetically enhanced will actually realise their capacities and work at a superior level, organisations may exclude the unenhanced from any recruitment campaign. While we should not forget that a

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[359] The demand for making educational resources accessible to all needs to be distinguished from the requirement to impose some sort of mandatory education. The place for mandatory education is to be defended on the grounds of securing the stability of the well-ordered society. This will be discussed in Chapter 8 of this thesis.

[360] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 73

[361] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Pages 21 and 274

genetic capacity is a mere potentiality, this clearly is illegitimate discrimination. A selection process should take into account actual skills and achievements rather than potentialities.

Consider now the introduction of genetic cognitive enhancements and the effect that they might have on the way Rawls's FEO principle is formulated. On a first reading of Rawls's FEO principle, those cognitively enhanced would be entitled to advantages conferred by their superior cognitive capacities. Once citizens have been born with enhanced capacities, adherence to the FEO will guarantee them equal access to jobs or positions as those with similar talents and motivation. Let us remember that this principle tracked differences in natural abilities and motivation alone.

However, these genetic interventions mean that what constitutes our natural cognitive capacities is now determined not only by our native talents, but also by technologies designed to modify these natural talents. Whether access to these technologies is open in a formal way is, I argue, a social factor that should be given due consideration. Having argued for their value as primary goods, particularly in their role of broadening the life prospects of individuals, a Rawlsian society would require that citizens are assured that no formal barriers are in place for citizens to preclude them to access these goods. Rawlsian theory should guarantee that access to these technologies is not restricted to people in the same way that access to jobs and positions and to education is not restricted on the bases of morally arbitrary factors. Even though it is not the role of the basic institutions to influence the distribution of natural talents, it is within their control to regulate access to the technologies that can potentially affect the distribution of these talents and ultimately the social product derived from them. The attention that needs to be given towards ensuring that no-one is deliberately excluded from acquiring these goods derives from the potential interest of the wealthy class to increase their economic and political power.

A situation where those with early access to the technologies put barriers to prevent others from acquiring them on the grounds of gender, baseline level of natural talents, or socio-economic class, must also be avoided. In the same way that FEO guarantees the removal of legal barriers in accessing jobs and positions, we need to eliminate legal barriers of access to these technologies. This formal requirement of

free access to these goods takes priority over issues pertaining to the distribution of the economic goods they might generate. I will refer to the principle that equal access to genetic cognitive enhancements should be protected formally as the principle of **formal equality of access to genetic cognitive enhancements.**

Even though the principle of FEO already provides us with the tools to avoid discrimination in access to positions based on the enhanced/non enhanced status of individuals, I have argued that an extension may be required to ensure that no legal barriers are created to stop citizens from accessing these technologies.

The Rawlsian principle of FEO, however, does not address concerns relating to the socio-economic inequalities caused by these modified natural talents. Since differentials in natural talents can potentially be magnified once these technologies are available, the next step is to assess whether the difference principle can regulate these inequalities so that they are to the advantage of the worst off.

Having eliminated the formal barriers to opportunity and provided citizens with the tools for them to have a fair chance to attain them, access to opportunities is now regulated in such a way that only the natural talents - whether these have been enhanced or not - and the willingness to develop them have a bearing on citizen's abilities to acquire advantageous positions.

Rawls now needs to deal with how native endowments, as they limit or enable citizens to access jobs and positions, can affect the distribution of socio-economic shares. Guaranteeing FEO says nothing about how socio-economic shares ought to be distributed and, without any controls, it could potentially allow large amounts of inequalities in wealth and income.

Bringing the focus back to the enhancement of cognitive natural talents, Rawls's interpretation of FEO highlights how different sectors of the population have access to different opportunities depending on their native talents. Our different range of talents and skills, shaped by the natural lottery, lead us to compete in a playing field with many different levels. This competitive level is determined by the different sets of skills and motivations possessed by the individuals. Someone with lower cognitive abilities may not have access to the same range of opportunities to access offices and positions as others with superior cognitive capacities. These different

competitive levels will be likely to result in differences in levels of primary goods that individuals enjoy. In a society governed by Rawls's two principles, the distribution of primary goods – and, therefore, the differences in the levels of goods enjoyed by the more and less talented – will be regulated by the difference principle.

The difference principle uses wealth and income as proxies for the overall allocation of primary goods held by citizens. Unequal distributions in the share of primary goods will be considered unacceptable unless they represent an improvement of everyone's prospects and, most importantly, maximises the position of least advantaged representative group. Rawls here proposes that inequalities may be justifiable if, over their complete life, the worst off are made as well off as possible. This is anchored in a prioritarian conception of justice that urges us, as a matter of justice, to assist those most vulnerable in society.

When discussing the type of inequalities that could be allowed, Rawls looks in particular at the entrepreneurial class and how their higher income may result in raising the long-term prospects of the labouring class. He observes how entrepreneurs may be encouraged, by the expectation of higher returns, to do things that would yield better prospects for the lower classes. These expected rewards would act as an encouragement to put in place more efficient and innovative processes that would eventually benefit everyone, including the least advantaged.[362]

Having included genetic cognitive enhancements in the index of primary goods they now become part of the assessment and measurement, done under the auspices of the difference principle, of the overall allocation of distributive shares. I have already suggested that taking a combination of income and wealth as a proxy measure for the primary goods not regulated by the first principle of justice would be the preferred option since it avoids issues of complexity and measurability. Following Rawls's proposal the least advantaged representative group will refer to the group of citizens with the least authority and the lowest income, in other words those belonging to the "income class with the lowest expectations."[363]

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[362] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 78

[363] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Pages 42-43

This group will have an equal share of basic liberties and enjoy FEO, but will have the least income and wealth. Since Rawls also believed that the least advantaged group is likely to include those with the lowest natural talents, this seems to be consistent with my assumption that those with higher talents are likely to reap the higher rewards arising from social cooperation. Once the worst off representative group is identified via the index of primary goods, the difference principle dictates that institutions are arranged so that that socio-economic inequalities work to their maximum benefit. The principle in isolation does not, however, tells us anything about the level of inequality between groups that is acceptable. To clarify, the treatment of inequalities under the difference principle seems to be compatible with a wide range of distributive schemes. This can be particularly worrying with the introduction of genetic cognitive enhancements. In practical terms, allowing the implementation of genetic cognitive technologies could mean that we have a group of wealthy, cognitively superior individuals whilst a big part of the population struggles with lower cognitive skills and a small share of income and wealth. This situation, under the difference principle alone, would be permissible as long as it was proved to be the best way to benefit those least advantaged in society. These extensive socio-economic inequalities between the wealthy and the poorest members of society puts at risk the balance in the political power enjoyed by citizens, which is at odds with the protection given by Rawls to political liberties.

Given this potential outcome allowable by the difference principle, would that be acceptable for a society whose citizens have to live under fair terms of cooperation? The answer that Rawls gives to his critics is simply "no". The difference principle is not working in isolation, the controls set by the principle protecting basic rights and liberties and the special value that Rawls gives to opportunity will limit wide ranging inequalities in society. Inequalities should be kept to such a level that they do not affect the individuals to a point that they do not consider themselves to be worthy members of society. Rawls would deem extreme levels of inequality unacceptable in a society governed by fair principles of justice. The special status given to FEO in particular explains how protection of opportunity limits allowable economic inequalities.

5.4.2 The priority of equal opportunity over the difference principle

The lexical ordering that Rawls gave to the principle of FEO over the difference principle provides us with another tool to address the potentially problematic introduction of genetic cognitive enhancement into his political conception.

Rawls explicitly argues for this priority even when restrictions to opportunity yield the greatest distributive shares to the least advantaged. According to Rawls this priority:

> *"expresses the conviction that if some places were not open on a basis fair for all, those kept out would be right in feeling unjustly treated even though they benefited from the greater efforts of those who were allowed to hold them."*[364]

The implication of this priority is that the difference principle is subordinate to the requirements set by FEO:

> *"The role of the principle of fair opportunity is to insure that the system of cooperation is one of pure procedural justice. Unless it is satisfied, distributive justice could not be left to take care of itself"*[365]

The difference principle is proposed by Rawls to work alongside the FEO and to compensate for the anticipated shortcomings of the FEO principle in dealing with different access caused by people having different talents. Rawls's answer to his frustration that opportunity will never be truly equal was to develop a system, via the difference principle, to regulate the resulting socio-economic inequalities. Since the least advantaged group is likely to include those with fewer natural talents, a taxation system that redistributes wealth and income towards the least advantaged will benefit those that have both fewer natural talents and, possibly, fewer opportunities to pursue.

In Rawls's view, re-directing economic shares to the least advantaged will also eventually lead to increased levels of opportunity. This can be done via a taxation system that regulates wealth transfer, as it happens with inheritance, between individuals. Using a tax on inheritance, Rawls is trying to avoid opportunities being

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[364] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 85

[365] Ibid. Page 87

entrenched within the same groups in society across generations. The income generated through this taxation system could be directed to investments in education, housing, or healthcare programmes that enhance the level of opportunities of those at the bottom of the economic ladder. Making income and wealth work at the service of opportunity seems obvious from a Rawlsian perspective since, for Rawls, the link between economic goods and life prospects is one that he takes for granted when he discusses the different distribution of income amongst social classes:

> *"…those starting out as members of the entrepreneurial class in property-owning democracy, say have a better prospect than those who begin in the class of unskilled labourers."*[366]

The previous section hinted at the fact that focusing on the maximisation of the economic position of the worst off might lose sight of the relative inequalities this principle might generate. However, the priority given to FEO puts a demand on the difference principle to limit the degree of inequality allowable in the distribution of socio-economic resources. Great accumulation of wealth and power in the hands of a few will limit the opportunities available to the least advantaged and therefore should be controlled.

5.5 A brief reflection about self-respect and the use of genetic cognitive enhancements

The Rawlsian response to the potential threats posed by cognitive genetic enhancements can also be supplemented with the value given to self-respect.

The social bases of self-respect not only is one of the primary goods that make up the Rawlsian conception of justice, but also, Rawls believes, is the most important primary good.

The idea of self-respect is closely linked to the status that citizens enjoy in society. It is through their position in society that citizens gain a sense of their own worth and

[366] Ibid. Page 78

the worth of their conception of the good. If citizens lack self-respect, Rawls argues, they will find themselves in a position where, whilst having a capacity to pursue their conception of the good, they would not see any value in pursuing it and would lack the will to do so. Self-respect is not only an internal psychological state. It is also dependent on the way others, in their relationships with us and actions towards us, demonstrate their sense of our worth and the worth of our conception of the good. Basic institutions have a key role in shaping how individuals view one another. The way these institutions are arranged may result in citizens viewing one another as moral equals or, conversely, as undeserving of respect and recognition as moral equals. Since the political conception applies to the basic structure of society, when it comes to protecting self-respect, the principles of justice regulate what Rawls called the social basis of self-respect. The internal psychological state of the individual cannot be regulated by institutions. However, a just society can provide institutional arrangements that encourage that sense of self-respect amongst individuals.

In *A Theory of Justice*, Rawls maintains that accepting any less than equal basic liberties and freedom would leave citizens engaging in political and economic activities in a weakened subordinate position in relation to those with greater liberty. This will ultimately be "humiliating and destructive of self-esteem".[367] The solution that Rawls gives to preserve and nurture the self-respect of citizens of the just society is twofold: first, society needs to give priority to equal basic rights and liberties as this "entails equality in the social bases of esteem"; [368] second, the institutional arrangements must be such that the fair value of political virtues is secured.[369]

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[367]Rawls uses self-respect and self-esteem interchangeably in his writings. It is important however to distinguish between self-respect/self-esteem as internal states and the social bases that establish the conditions to promote those internal states ibid. Page 545

[368] Ibid. Page 546

[369] Wall, however, thinks that the argument of self-respect as justification for securing the fair value of political liberties overreaches. Not protecting the fair value of political liberties will not mean that the self-respect of citizens is damaged in all liberal societies. However what I'm trying to prove is how threats to these liberties would be protected under the Rawlsian theory of justice and not whether there are potential liberal societies where the full extent of the protection afforded to these liberties does not apply.

Wall, S. (2006). "Rawls and the status of political liberty." *Pacific Philosophical Quarterly*, 87(2), 245-270.

The priority that is given to basic rights and liberties together with the assurance of the fair value of political liberties are the key social bases of self-respect. The crucial value of self-respect, therefore supports the special treatment that Rawls affords to the basic rights and liberties. This entails the public affirmation of the basic liberties by citizens in a way that expresses "*their mutual respect for one another as reasonable and trustworthy, as well as their recognition of the worth all citizens attach to their way of life."*[370]

In a society where unequal access to genetic cognitive interventions gives rise to political privilege self-respect would be damaged, unless the mechanisms for the protection of basic rights and liberties envisaged by Rawls are in place. By having institutional arrangements where protection and priority is given to political liberties, a clear message is sent to those cognitively enhanced that their lives are not of a higher value and are not entitled to a superior status as far as institutional arrangements are concerned.

The institutions securing access to fair equality of opportunity are also considered to be part of the social bases of self-respect. According to Rawls this negative effect on self-respect would depend on two factors. One being the actual magnitude of the inequality endured; and, the other, the public reasons offered to the individuals suffering the inequality.[371]

Restricted access to opportunities following the introduction of these enhancements can arise from both the direct discrimination against the enhanced/unenhanced in accessing positions and from the vast accumulations of wealth at the hands of those benefitting from these interventions.

The exclusion from access to positions based on racial characteristics, gender or creed fails to treat individuals with the dignity and respect they are owed as equal moral agents. This, in turn, may have a damaging effect on the individual's own sense of worth.

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[370] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 319

[371] Rawls, J. (1999b). "A theory of justice - Revised Edition." *Harvard Univ Pr*. Pages 469-471

Inequalities accessing opportunities derived from restricted access to genetic cognitive enhancements may result in excessive inequalities in the distribution of socio-economic goods. Rawls believes that this will affect the individual's sense of worth as follows:

> *"Significant political and economic inequalities are often associated with inequalities of social status that encourage those of lower status to be viewed by themselves and by others as inferior. This may arouse widespread attitudes of deference and servility on one side and a will to dominate and arrogance on the other. These effects of social and economic inequalities can be serious evils and the attitudes they engender great vices."*[372]

It is evident from these writings that Rawls would regard excessive socio-economic inequalities as a threat to our sense of worth and how others value us and our life plan. The value of protecting self-respect then strengthens the argument of the priority of protecting access to opportunities for all, over allowing widespread inequalities, even when they work to the advantage of the worst off. Additionally, and recognising the damaging effect that a failure to protect liberties and opportunity can have on self-respect, Rawls incorporates this primary good in the index assessing how well-off individuals really are. Whatever inequalities the difference principle permits, would have been determined taking into account how they affect the citizens' self-respect. Rawls is mindful that increases in income and wealth generated for the benefit of the least advantaged may be outweighed by even bigger losses in self-respect or our self-worth. Having a sense of self-respect, as Rawls claims, involves having confidence in our own ability to pursue our chosen life plan and fulfil our intentions which must not be compromised.[373] The need to consider goods relating to the individual's status and self-respect restricts the relative inequalities deemed allowable in society across the different socio-economic positions.

The Rawlsian framework, via the protection given to basic rights and liberties, access to equal opportunities and the regulation of socio-economic inequalities

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[372] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 131

[373] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 440

fends off any potential threat to this important primary good through the introduction of genetic cognitive enhancements.

5.6 How can genetic cognitive enhancements support the Rawlsian principles of justice?

In developing the principles of justice I have shown how Rawls appears to deal with social and natural contingencies very differently. The purpose of the FEO principle is the elimination of social contingencies insofar as they affect the life prospects of individuals, whilst leaving the inequalities caused by natural contingencies to the difference principle. This differential treatment is somewhat at odds with the equal weight that he seems to give to the inequalities caused by both types of contingencies and it ignores the link between the development of natural talents and the social conditions endured by the individual. The line between social and natural contingencies is especially blurred in the case of genetic cognitive enhancements. Accommodating these new technologies into the Rawlsian framework is, however, possible, as I have argued in the previous sections. Rawls's political conception provides sufficient safeguards to prevent the social justice fears often associated with these technologies. Additionally, a simple extension granting the formal legal protection to access these technologies, will further strengthen formal equality of opportunity regulations and solve any potential problems of exclusion.

Now my attention turns towards showing that these enhancements should be morally permissible not only because they do not threaten justice in the well-ordered society, but also because, I argue, they could contribute to, and strengthen, the work done by the Rawlsian principles of justice.

First, I focus on the Rawlsian principle of FEO and the priority it commands over income and wealth distribution schemes, I argue that genetic cognitive enhancements, alongside education, can do some of the work towards improving the level of opportunities of the least advantaged.

Second, I show how the introduction of genetic cognitive enhancements is likely to yield productivity gains, which in turn will give rise to economic goods to be distributed under the dictates of the difference principle.

By increasing the range of available opportunities and the economic resources available for distribution, genetic cognitive enhancements will, alongside education, strengthen the work done by the principles of justice in reducing existing inequalities.

5.6.1 The interaction of genetic cognitive enhancements and education and their contribution to the achievement of fair equality of opportunity

The implications of Rawls's principles of justice for the distribution of investment in education can be understood in, at least, three ways. First, people with equal talents should have access to the same educational opportunities. Second, we might most effectively increase the social product by investing in educational opportunities for the more talented. Third, we might most effectively promote fair equality of opportunity by investing more in the less talented (and those with social disadvantages), especially in the early years of education.

Next, I provide a brief explanation of how Rawls justifies each of these approaches in his writings.

Rawls advocates the use of compensatory measures designed to close the gap between children coming from opposite ends of the socio-economic spectrum. It was Rawls's conviction that children with equal talent and motivation should fare similarly as far as educational achievement is concerned. This belief commits Rawls to guaranteeing equal access to educational resources on the basis of natural abilities alone. The equal distribution of educational resources is hence guaranteed on the grounds of fair equality of opportunity.

However, the Rawlsian difference principle will provide the criteria for allowable unequal distribution of these resources. Rawls provides an argument for the allocation of more educational resources to those with higher cognitive talents. The argument goes that concentrating educational resources on those with higher levels of natural talents will enhance human capital yielding higher levels of productivity. This productivity gain will then be added to the available stock to be redistributed to

the least advantaged. Only when these gains work to the maximal benefit of the least advantage, will this diversion of resources be allowed.[374]

Within his theory, Rawls has now provided a criterion for both the equal and the unequal distribution of educational resources. That is, equal distribution for those with equal talent and motivation and an unequal distribution provided it maximally benefits the least advantaged. However, his unequal distribution is further constrained by a demand to consider how these educational resources affect citizens in more subtle ways:

> *"resources for education are not to be allotted solely or necessarily mainly according to their return as estimated in productive trained abilities, but also according to their worth in enriching the personal and social life of citizens."*[375]

This means that the enrichment of all lives, including the lives of the least advantaged will also need to be taken into account before allocation is decided purely on the expected return of these trained abilities. These more intangible considerations are linked to how unequal distributions might affect the sense of worth of the individual. Echoing Rawls's concerns, other authors such as Brighouse and Swift, have also remarked on the importance that equal distributions of education might have on the flourishing and wellbeing of individuals.[376] Similarly, Pogge warns of the devastating effect that excluding citizens from education on grounds of their native talents will have on the important primary good of self-respect.[377]

Considerations of efficiency and increased social product are clearly not the whole picture. A balance needs to be struck between the potential increase in the social product to be distributed through the combination of genetic interventions and education, and the potential negative effects on the least advantaged.

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[374] Ibid. Page 101.

[375] Ibid. Page 107

[376] Brighouse, H., and Swift, A. (2014). "The place of educational equality in educational justice." *Education, justice and the human good. Fairness and equality in the education system*, 14-33.

[377] Pogge, T. W. M. (1989). *Realizing rawls*: Cornell University Press. Page 174

It could be argued that the balance to be struck is even more difficult since Rawls's writings also support the diversion of educational resources to those least talented, which are presumably those also falling within the least advantaged group:

> *"to provide genuine equality of opportunity, society must give more attention to those with fewer native assets and to those born into the less favourable social positions. The idea is to redress the bias of contingencies in the direction of equality. In pursuit of this principle greater resources night be spent on the education of the less rather than the more intelligent, at least over a certain time of life, say the earlier years of school."*[378]

The role of education for Rawls lies in its capacity to narrow the differences in developed natural talents, understood by Rawls as intelligence, and therefore in its capacity to narrow the gap in life prospects. Rawls hopes to achieve that differentials in natural abilities either do not translate, or minimally translate into differentials in socio-economic goods.

The introduction of genetic enhancements can affect the way education delivers its Rawlsian role, specifically through the improvement of educational outcomes and increasing the productivity gains available for distribution under the difference principle.

5.6.1.1 Improving the outcomes of educational achievement

The enhancement of the natural cognitive capacities of future offspring is likely to lead to improvements in educational achievements from one generation to the next. Natural aptitude is often seen as a major contributor towards educational success. All things being equal, it would make sense to assume that, as we enhance the genetic component of cognition, we might achieve better results with the same level of educational resources. This does not imply that other factors such as parental encouragement, nutrition, and a supportive social network can be substituted by new enhancement technologies. On the contrary, the idea is that these technologies will be working alongside all the environmental elements that contribute to the development of natural talents. Starting from a higher level of natural abilities, we

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[378] Rawls, J. (1971). *A theory of justice*: Belknap Press. Pages 100 and 101

might find that, whilst keeping all environmental cognitive aids equal, there is an improvement in educational outputs.

However, a higher education level might not immediately guarantee the achievement of greater educational outputs developed under the same environmental conditions. The degree of improvement might also depend on the educational stage and age of the child as well as the task or subject area in question. Motivation and self-discipline might be equally or more important for educational achievement. Notwithstanding this consideration, research has shown that the genetic component of intelligence is one of the drivers of educational achievement.[379] Achieving greater educational success as a consequence of enhanced cognition might also have the additional bonus of affecting the level of effort and motivation we might be willing to dedicate to our chosen pursuits. Brighouse and Swift have highlighted how "someone who has natural talent with respect to some activity is more likely to experience the rewards of early success and thus to have more incentive to continue to exert effort than someone who is less talented."[380] Enhanced cognitive talents combined with the higher level of motivation resulting from their educational rewards may also contribute to the successful pursuit of both educational and non-educational endeavours.

Another factor associated with enhanced natural talents is the potential need for educational resources themselves to adapt to and better suit our modified cognition. Institutions over time might need to consider how the introduction of these technologies could affect both the content and mode of delivery of education. The changes in cognition are likely to require that education changes to accommodate a progressively superior level of talents. Think for a moment of the improved capacity for information processing. Even if we are not referring to the kind of changes that

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[379] Olson, R. K., Keenan, J. M., Byrne, B., and Samuelsson, S. (2014). "Why Do Children Differ in Their Development of Reading and Related Skills?" *Scientific Studies of Reading*, 18(1), 38-54.

Krapohl, E., Rimfeld, K., Shakeshaft, N. G., Trzaskowski, M., McMillan, A., Pingault, J.-B., Asbury, K., Harlaar, N., Kovas, Y., and Dale, P. S. (2014). "The high heritability of educational achievement reflects many genetically influenced traits, not just intelligence." *Proceedings of the National Academy of Sciences*, 111(42), 15273-15278.

[380] Brighouse, H., and Swift, A. (2014). "The place of educational equality in educational justice." *Education, justice and the human good. Fairness and equality in the education system*, 14-33. Page 27

takes people to beyond a species typical level, we might find that the classic style of classroom lecture delivery might soon become obsolete. Non-genetic means of enhancements such as IPads and smart phones have already forced the introduction of mobile teaching technology that goes beyond the classroom. Students no longer need to be physically present in a classroom to learn or interact with the teacher and other students. Arguably, more efficient ways of learning have become available via these external enhancements. Genetic enhancement is likely to contribute to these changes even further.

Genetic cognitive enhancements might lead to better educational outcomes and also to changes in the mode of delivery and content of education. The capacity to keep up with how citizens are able to enhance cognition will ensure that these talents are developed and translate into very real educational achievements.

5.6.1.2 Increasing the total social product available for distribution

Let us recall how the argument from efficiency was used by Rawls to justify the diversion of educational resources to those with higher natural talents.

The availability of genetic cognitive enhancements will bring about an increase in the cognition of future children, subject to the reproductive decisions taken by their parents. As a result, some of these future citizens will fall within the most talented and, as per the Rawlsian difference principle, they will be entitled to a higher share of educational resources. Their enhanced cognition combined with education will yield higher productivity gains that will benefit the least advantaged. Not only may these interventions be beneficial to those individuals who have them, but their implementation can bring about broad social benefits that can be made to work to the benefit of those most in need.

Allen Buchanan has also linked enhanced cognition with increases in productivity and gains in human wellbeing. Buchanan uses productivity in the sense of improved output to input ratio and also as a measurement of "how good we are at using existing resources to create things we value."[381] The argument presented is that

[381] Buchanan, A. (2008). "Enhancement and the ethics of development." *Kennedy Institute of Ethics Journal*, 18(1), 1-34. Page 7

cognitive enhancements in particular have the potential to increase this productivity:

> *"Other things being equal, with enhanced cognitive capacities people will be able to do what they now do more quickly and efficiently and also may be able to do some new things they will value."*[382]

This is reminiscent of the argument presented earlier in this thesis supporting the introduction of cognitive enhancements as primary goods as they help citizens to better choose, revise and pursue their conception of the good. Our chosen conception of the good can be said to be something we clearly value and, following Buchanan, certain enhancements will better equip us to successfully pursue it.[383]

An important characteristic attached to genetic cognitive enhancements is how they can become more valuable as more individuals have them. This is not only because of the individual productivity gains generated by the enhanced. The widespread introduction of enhancements may also generate what Buchanan defines as "network effects". These network effects relate to how the benefits of the enhancement on the individual depend on how many other people are also enhanced. Literacy, numeracy and the widespread use of computers are given as examples of external cognitive enhancements which become more beneficial as more people have them. For example, there doesn't seem to be much point in being an excellent novelist if no-one is able to read your books. An unforeseen and welcome consequence of these network effects is how they might make citizens collectively less dependent on a small pool of talented individuals. As a consequence of this wider spread of talent, people might recognise that their "bargaining power" is limited and be motivated to accept higher taxes than they would do otherwise.

It is also clear how the amount of shared knowledge will increase as more people are able to read and pass their own acquired knowledge to other individuals. Many individuals with increased cognition will be able to achieve together what one individual was not capable of achieving. This increase in the knowledge stock held

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[382] Ibid. Page 9

[383] Ibid. Page 10

by society can be put to use towards increasing and improving the social product and wellbeing of individuals. According to Buchanan, it is society's responsibility to identify those technologies that could have productivity increasing effects and assess this against the potential losses of forgoing these technologies.

A similar argument to that presented by Buchanan has also been put forward by Fritz Allhoff who claims we need to be guided by the criteria of "justifiable societal gain" when assessing potential inequalities caused by unequal access to cognitive enhancement technologies. Inequalities in access could be permissible, Allhoff claims, if they resulted in a large social product benefitting everyone in society.[384] For example, Allhoff suggests we might be able to permit inequalities if the end result was that we find a solution to environmental problems. This kind of approach is clearly reminiscent of the Rawlsian reasoning that eventually led him to the development of the difference principle.

One of the main differences of Rawls's political conception over Allhoff's defence of permissible inequalities is that, as we have seen, it restricts inequalities based on societal gain further on the grounds of liberty, self-respect and opportunity. Should these societal gains be achieved at the expense of lower and less valuable liberties, damage to opportunity and harming the self-respect of some members of society, these inequalities would not be allowed. Allhoff's proposal would have to be further qualified so as not to collapse into utilitarianism. As we know, societal gains may hide behind them a range of impermissible violations to the exercise and development of the citizens' two moral powers.

Since Rawls conceived society as a "fair system of co-operation over time",[385] a political conception following the Rawlsian principles would seem to support those genetic enhancements that secure the resources necessary to preserve the basic institutions for future generations. Increases in productivity generated by these new technologies might help fulfil this function. Furthermore, the increased social

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[384] Allhoff, F. (2005). "Germ-line genetic enhancement and Rawlsian primary goods." Ibid., 15, 39-56. Page 44

[385] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 14

product and the generated network effects will help the work done by the difference principle in closing the gap in socio-economic inequalities.

5.6.3 Genetic cognitive enhancements working towards easing the limitations in access to opportunities caused by differentials in natural talents

Despite the work that education does in the Rawlsian theory towards ensuring fair equality of opportunity, the fact still remains that people's different levels of natural talents will lead to them having access to different levels of opportunities. Once again, we find that the commonly levelled criticism that the Rawlsian FEO is too endowment sensitive applies. As Jonathan Brown points out:

> *"By relativizing equal opportunities to individuals' talents and motivations, Rawls's theory allows individuals unlucky in the genetic lottery to have insufficiently wide ranges of opportunities."* [386]

Although Brown is particularly concerned about those individuals falling below the normal functioning level, it is true however that the range of available opportunities might always depend, to some degree, on the level of natural talents possessed by citizens. As I have shown previously, Rawls suggests that educational resources should be distributed in a number of ways. Prioritising the value of self-respect, he justifies the distribution of more educational resources towards the least advantaged group, regardless of their natural talents. This would be consistent with Rawls's own belief that offering equal quality and level of education to everyone would be in line with maintaining the priority of equal opportunity over the difference principle.

However, the conditions of justice mean that we need to take into account how best to allocate scarce resources. Diverting more resources to the least advantaged on grounds of self respect might ultimately result in the neglect of other societal needs. Furthermore, even if offering equal levels of education to everyone was a feasible alternative, this would still fail to address the different educational achievements caused by initial differences in natural talents. The introduction of genetic cognitive

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[386] Brown, J. S. (2001). "Genetic manipulation in humans as a matter of Rawlsian justice." *Social theory and practice*, 27(1), 83-110. Page 91

enhancements may ease the burden on the use of educational resources as follows: The uptake of these technologies may lead to a progressive improvement of the baseline genetic level of individuals. Genetic cognitive enhancements will not and should not aim to achieve any kind of genetic equality. The different initial cognitive levels of individuals are likely to mean that there will always be differentials in natural cognitive capacities. Nonetheless, as the genetic cognitive capacities of individuals improve, so will the educational levels they would be able to access. As these improved capacities work alongside education, not only will there be an improvement in productivity, but also the disadvantage they face in accessing jobs and positions of responsibility may itself be reduced. Despite the positional character attached to positions of responsibility, the range of life plans available for citizens for them to choose will be, nonetheless, widened.

Cognitive enhancements can therefore promote FEO by contributing towards enhancing the range of life chances available to all.[387]

5.6.4 Working to the maximum benefit of the least advantaged

The role of education in facilitating access to opportunities and promoting the wellbeing of the least advantaged has been a source of criticism of the Rawlsian political conception. The special attention that the Rawlsian theory pays to those more talented, biasing the distribution of educational resources towards them, may disadvantage those most in need. The danger here is that this distribution does not help the range of opportunities of the least advantaged and it might result in greater socio-economic inequalities by not providing the extra educational resources needed to develop their inferior natural talents. Rawls may presumably be able to answer this criticism, saying that the least advantaged will still be entitled to access an appropriate amount of educational resources that protects their sense of worth. Moreover, as Thomas Nagel[388] argues when a system of fair equality of opportunity is in place, the access to education is such that individuals are enjoying education to

[387] Gomberg, P. (2010). "Dilemmas of Rawlsian opportunity." *Canadian Journal of Philosophy*, 40(1), 1-24.

[388] Nagel, T. (1997). "Justice and nature." *Oxford J. Legal Stud.*, 17, 303. Page 316

the limits of their capacities. Any social inequality generated by that system is not unjust "if natural differences among the persons involved are its primary cause."[389]

Further problems for the least advantaged might also arise from the provision of compensatory education. Paul Gomberg thinks that the provision of compensatory education envisaged under the FEO is inadequate:

> *"compensatory education for children of the less advantaged would likely be insufficient to cancel income and wealth advantages unless we prohibited parents from bringing educational materials inside the home, using their resources to give their children enriched experiences, prolonging their educational opportunity, or even spending more time with them. These prohibitions would violate the liberty principle."*[390]

The effect that the family had in the life prospects of their offspring was acknowledged by Rawls as he claimed that "even when fair opportunity (as it has been defined) is satisfied, the family will lead to unequal chances between individuals."[391] Given the priority that Rawls gave to opportunity, it seems that he would have supported the abolition or at least the regulation of the family[392] so that the disadvantages suffered by children because of their family environment could be minimised. However, Rawls believed that once citizens realised that the whole system overall was designed so that advantages to the worst off were maximised, they would more readily accept the fact that some social barriers (such as the family) still remained and influenced their fortune.

The availability of genetic interventions might help to address the residual disadvantages that the least advantaged might face once the FEO and the difference principle are satisfied.

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[389] Ibid.

[390] Gomberg, P. (2010). "Dilemmas of Rawlsian opportunity." *Canadian Journal of Philosophy*, 40(1), 1-24. Page 11

[391] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 511

[392] This would at least be the case as long as the family were granted some fundamental rights protected under the first principle of justice – this is not clear from his writings.

Current evidence from the use of smart drugs indicates that the biggest improvements in cognition show in those that present the lowest levels of cognition at the beginning of the studies.[393] This evidence drawn from in pharmacological studies[394] may give us reasons to believe that genetic interventions may also have a bigger impact on those starting from a lower threshold. Therefore, those that are least advantaged from a genetic perspective may benefit more than those who are considered to have higher starting genetic cognitive capacities. Rawls believed that that those least talented are likely to be members of the least disadvantaged group.[395] Consequently, the use of genetic interventions amongst the least talented individuals may ultimately benefit the least advantaged group.

I have outlined how genetic interventions will be considered a primary good and therefore be part of the index of primary goods that measures how well off people are. Individuals would be left free to acquire these interventions with their economic primary goods (i.e. their bundle of income and wealth). The Rawlsian society may however also consider partly subsidising these interventions based on the evidence that they are likely to benefit the least advantaged[396] the most. The aim of such a policy would be to narrow the inevitable differentials in natural talents and subsequently, the differentials in socio-economic allocations caused by them. However, this kind of policy must be carefully considered if the Rawlsian society is to remain neutral amongst the very diverse and irreconcilable comprehensive world views.

Notwithstanding the difficulties associated with the implementation of a policy subsidising these interventions, the general availability of these interventions granted by the absence of formal barriers of access will help towards the equality

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[393] Farah, M. J. (2002). "Emerging ethical issues in neuroscience." *Nature Neuroscience*, 5(11), 1123-1129.

[394] Section 2.1.1 in Chapter 2 provides a examples illustrating how low baseline levels usually report higher improvements.

[395] Rawls, J. (1999b). "A theory of justice - Revised Edition." *Harvard Univ Pr*. Page 83

[396] In offering the enhancements to the least advantaged group identified in socio-economic terms, Rawls would avoid the thorny issue of having to identified this group based on genetic levels of cognition normalcy. This would avoid potential accusations of "old eugenic" practices whereby individuals are classified in genetic terms leading to potential moral value judgments about their worth.

that Rawls is trying to achieve. Access to these technologies, benefiting those least advantaged, may in itself contribute towards more equality in the distribution of natural cognitive talents and lead to more equality in the distribution of socio-economic resources.

5.6.5 Better use of scarce resources

Recall that one of the assumptions that Rawls makes at the point of deliberating about the principles of justice is that one of the facts of modern democratic societies is that they exist under conditions of moderate scarcity. This implies that tough choices need to be made regarding the services and primary goods it can afford to support and promote. The reality of working with scarce resources however should not be an insurmountable barrier against the implementation of genetic technologies. In fact, it might provide us with another argument supporting their introduction.

The offer of educational resources under the fair equality of opportunity is not immune to this. Governments need to prioritise available funds and allocate them towards the alleviation of other social problems such as child poverty, illiteracy or the treatment of crippling diseases such as Huntington's disease, Alzheimer or cancer. Should citizens choose to genetically enhance the cognition of their children, this might lead to lower investment in education for the achievement of equivalent educational outputs. In other words, the investment in educational resources in the enhanced population might not need to be as high in order to yield the same results.

Genetic cognitive enhancements might lead to a society with a larger number of citizens who are better skilled needing less financial input from the government. The permissibility of these interventions could therefore be justified on account of "the just savings principle".[397] Enshrined in this duty is the obligation to preserve the conditions needed to protect background justice over time. Citizens, according to Rawls, have a duty to do whatever is necessary to ensure that future generations

[397] "*Real saving is required only for reasons of justice: that is, to make possible the conditions needed to establish and preserve a just basic structure over time*". Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 159

live under just conditions and to leave their descendants with the equivalent level of capital and societal resources that they received from previous generations.[398]

A call for prudent spending in order to be able to secure the background justice conditions may mean that citizens have a moral duty to cognitively enhance their children if this results in the use of fewer resources needed for them to become citizens of the well-ordered society.

5.7 Healthcare and genetic cognitive enhancements – two different approaches in the extension of the Rawlsian FEO principle.

My attempts to incorporate genetic cognitive enhancements into the Rawlsian scheme can be contrasted to approaches for dealing with the distribution of healthcare. The similarity between healthcare and genetic cognitive enhancements resides in the way they affect the range of opportunities of individuals. Both goods will contribute towards increasing the range of opportunities available to individuals by improving their level of functioning.

The best way to illustrate the role of healthcare in the Rawlsian political conception is by outlining Norman Daniels's approach to its distribution. Even though other authors have proposed schemes of healthcare distribution that are intended to be consistent with the Rawlsian framework[399], Daniels, I believe, provides the most fully developed account by extending FEO to include healthcare. His concept of healthcare does not just include medical assistance, it is a broader concept including six distinct dimensions: adequate nutrition; sanitary, safe, unpolluted living and working conditions; exercise, rest and healthy lifestyle habits; availability of medical services; personal and social support services and an appropriate distribution of other social determinants of health.[400] Daniels aims to solve the problem of meeting health needs through their incorporation into a theory of distributive justice suitable to accommodate the requirements of individuals falling below a normal

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[398] Rawls, J. (1971). *A theory of justice*: Belknap Press.Page 284 -293

[399] See chapter Pogge, T. W. M. (1989). *Realizing rawls*: Cornell University Press. Pages 181-197 and Green, R. M. (1976). "Health care and justice in contract theory perspective." *Ethics and Health policy*, 111-126.

[400] Daniels, N. (2008). *Just health: meeting health needs fairly*: Cambridge University Press. Pages 42-43

functioning level. Daniels identifies normal functioning in health, with the level that can be considered typical within a particular species. Any adverse departures from this species typical level will mean that we are no longer within the normal functioning range. According to Daniels, species typical functioning needs to be maintained because of the way that it protects the range of opportunities open to individuals.[401] This requires that access to resources needed to maintain or restore a species typical level of health, be given special protection under the Rawlsian conception. The aim is to safeguard people's ability to be fully functioning citizens and their capacity to participate in the political, social and economic life. Furthermore, Daniels here protects what he calls the normal range of opportunities defined as the "array of life plans reasonable persons are likely to develop for themselves."[402]

Daniels achieves this by enshrining the concept of health needs within the fair equality of opportunity principle. Although the list of primary goods included in the Rawlsian index of primary goods remains the same, Daniels proposes that the concept of opportunity itself includes healthcare needs in the same way it does with educational resources. The extension of the FEO in this way seems to be a logical development of the Rawlsian theory in its commitment to maintain the normal functioning level of individuals. Even though in his early writings Rawls largely avoided any talk about the provision of healthcare with the assumptions that citizens were at the normal functioning level, he makes explicit his assumption that measures should be taken to maintain the health of the citizens in his later writings:

> *"provision of medical care, as with primary goods generally, is to meet the needs and requirements of citizens as free and equal. Such care falls under the general means necessary to underwrite fair equality of opportunity and our capacity to take advantage of our basic rights and liberties, and thus to be normal and fully cooperating members of society."*[403]

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[401] Daniels, N. (1981). "Health-care needs and distributive justice." *Philosophy and Public Affairs*, 10(2), 146-179, Daniels, N. (2001). "Justice, health, and healthcare." *American Journal of Bioethics*, 1(2), 16, Daniels, N. (2008). *Just health: meeting health needs fairly*: Cambridge University Press.

[402] Daniels, N. (2008). *Just health: meeting health needs fairly*: Cambridge University Press. Page 43

[403] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 174

Daniels drops Rawls's idealised position of normal functioning altogether and develops a version of the Rawlsian FEO principle that he believes accommodates those instances where disease and disability stopped citizens from being fully cooperating members of society. Taking as a template the institutions regulating the provision of education that underwrites the FEO principle, there is room, Daniels argues, for the inclusion of healthcare institutions in line with the same central intuitions.[404]

The institutions that Daniels has in mind are those covering all the six domains that he believes matter in securing and maintaining health. These institutions will regulate the provision of healthcare resources including public health, environmental cleanliness, food and drug protection or personalised medical care. The recognition that individuals have claims relating to their healthcare needs is anchored in the FEO principle, Daniels now needs to provide an answer as to how best to meet these claims.

Having recognised that people have a right to health based on the protection of opportunities, Daniels needs to decide how the resources that meet these health needs are to be distributed. Recognising that scarce resources put limits on how these health needs are met, Daniels acknowledges that both the institutions regulating healthcare and other resources needed to meet FEO must be weighed against each other and therefore moral judgements will be needed for decisions of resource allocation. It is important that, in an attempt to provide people with the appropriate level of healthcare resources to achieve a normal level of functioning, we do not jeopardise the provision of other opportunity widening goods, such as education. Furthermore the link between education and health is such that neglecting to adequately provide for education will ultimately damage the health of our citizens. When discussing the effect of income inequalities on health across the US, Daniels mentions how those states with less egalitarian distributions have lower levels of educational spending and worse educational outcomes. As a result, Daniels issues the following warning:

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[404] Daniels, N. (1981). "Health-care needs and distributive justice." *Philosophy and Public Affairs*, 10(2), 146-179.

> *"These effects on education have an immediate impact on health, increasing the likelihood of premature death during childhood and adolescence (as evidenced by the much higher death rates for infants and children in the high inequality states). Later in life these effects appear in the socio-economic gradient in health."*[405]

Taking into account scarcity of resources, and the balancing of other societal needs, Daniels proposes that institutions need to be set up so that a scheme of universal healthcare is provided whether this is through public provision, private insurance or a mixture of both. This scheme is supposed to cover appropriate healthcare needs. In order to not deplete healthcare resources by giving absolute priority to those with most healthcare needs, Daniels replaces this requirement with a less demanding duty to give **some priority** to the least advantaged. This modification to the Rawlsian account means that Daniels can balance social needs without depleting all resources in the provision of healthcare. The principle of opportunity protecting access to healthcare is however too general and indeterminate to be able to specify a fair allocation of resources. A more fine grained account where we set the limits in meeting health needs and the actual delivery of healthcare resources will be part of a public deliberation process characterised by the conditions of publicity, reasonableness[406] and adequate appeal and enforcement mechanisms. Only if this process is followed, will society achieve a justifiable approach to the distribution of healthcare originating from the requirement to protect opportunity.

An exposition of Daniels's account helps to illustrate the main differences between his FEO extension to healthcare and my proposal to incorporate genetic cognitive enhancements into the Rawlsian framework. What follows explains the differences between these two approaches.

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[405] Daniels, N. (2001). "Justice, health, and healthcare." *American Journal of Bioethics*, 1(2), 16. Page 8

[406] Reasonableness for Daniels is "reasons and principles that are accepted as relevant by people who are disposed to finding terms of cooperation that are mutually justifiable" ibid. Page11

5.7.1 The introduction of genetic cognitive enhancement vs. Norman Daniels's extended FEO: Two distinct approaches to enhance opportunity.

Daniels's approach shows how essential goods for ensuring fair equality of opportunity can be incorporated into the Rawlsian conception of justice. Given the opportunity of promoting value of genetic cognitive enhancements, a question might be posed regarding why a fuller integration into the Rawlsian framework, similar to that of healthcare, has not been considered. A closer scrutiny of the differences between both goods reveals that they need to be understood very differently in terms of the demands of justice.

Norman Daniels's account of health is developed in order to protect opportunity, His theory rests on the duty to protect the normal functioning of individuals so that access to opportunities is not jeopardised. Conversely, the proposed use of genetic cognitive enhancements in this thesis is that of increasing the citizens' cognitive capacities beyond the normal functioning level. Where Daniels aims to protect the range of opportunity of individuals, my account aims to enhance this range of opportunity. My account therefore takes for granted the normal range of opportunities that would ordinarily be available to them and that Daniels attempts to protect.

Daniels has, in fact, argued against any requirement of justice to secure enhancements:

> *"Enhancing otherwise normal conditions— even when they put us at a disadvantage compared to others through no fault of our own—is then viewed as "not medically necessary."*[407]

Since our chosen enhancements are not medically necessary, an account of justice will not need to warrant their universal access and hence their protection under FEO. Daniels's reluctance to include these technologies also rests on the presumption that support for their introduction into an account of justice is grounded solely on the moral arbitrariness of native talents. This, according to Daniels, would lead to an extremely demanding account of justice that is required to

[407] Ibid. Page 5

compensate in some way for the diminished shares in social goods derived from factors that are beyond our control. Daniels feels this reasoning is faulty because it places too much weight on the issue of responsibility. However, a defence of cognitive enhancements can also be anchored on the very principle he himself uses for his defence of universal healthcare, namely, that the distribution of cognitive talents can unreasonably impact on the range of opportunities of individuals.

Scarce resources mean that guaranteed universal access to these technologies is beyond what the Rawlsian account of justice[408] would require. However, given the priority that Rawls gives to opportunity and the role that these technologies have in increasing the native talents of the least advantaged and hence their range of opportunities, there is a duty to eliminate any legal barriers to access. Anti-discriminatory legislation needs to be in place so that anyone who wants access to these technologies has the option to access them.

A further difference between both accounts is how genetic cognitive enhancements, unlike healthcare, have been added to the index of primary goods. As explained in Chapter 4, their role within the index is that of identifying the least advantaged representative group and establishing the relative position of citizens. Rawls did not see the need to add health or healthcare to the index of primary goods since he worked on the assumption that people were (at least most of the time) functioning normally. Despite dropping the normal functioning assumption, Daniels believes that introducing healthcare into the index of primary good adds complexity to the index and raises the issue of weighing and ranking goods. If healthcare is added to the mix, Daniels argues, it will be extremely difficult to determine whether citizens having an equivalent index allocation and enjoy roughly equivalent equal positions. We would need to know whether their health resource allocation adequately meets the needs to maintain or restore normal functioning. For some it might mean only a small allocation is needed whereas for others with chronic conditions it might mean the vast amount of the overall index. Equal shares will mean very different things depending on the level of functioning of individuals.

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[408] Other accounts based on sufficentarian or prioritarian principles of justice would also most certainly rule out the universal access to genetic cognitive enhancements

Genetic cognitive enhancements however do not face the same problem of measurement. One of the advantages is that we start from a baseline of normal functioning, and the aim is not to achieve specific levels of superior functioning. Getting enhanced is a one off event in the lifetime of citizens and there is no risk of increasing costs in order to achieve ever increasing levels of functioning. Furthermore, the least advantaged group is likely to receive the most benefit unlike in the healthcare example where people with very complex health needs may never be as well off as those already functioning at a normal level.

Although in defending the enhancement of normal capacities my account may seem more demanding and controversial than that of Daniels, it also shows that the introduction of genetic cognitive enhancements can be incorporated into the Rawlsian framework without the need to drop Rawls's normality assumption nor change the institutional structures needed to control the distribution of these technologies

5.8 An alternative approach to dealing with newly emerging technologies – Farrelly's Lax Biological Difference Principle

The previous section contrasted Daniels's account of healthcare with my own approach incorporating genetic cognitive enhancements into the Rawlsian framework. My attention now turns to the evaluation of Colin Farrelly's theory for dealing with variations in natural talents and how this differs with my own account.

Colin Farrelly chooses the Rawlsian difference principle as the platform for his theory. He modifies the difference principle in order to incorporate the demands posed by newly emerging technologies. Farrelly frames this modification by moving from the ideal to the non-ideal setting where "scarcity and pervasive disadvantage"[409] prevail. Farrelly criticises Rawls for ignoring the non-ideal conditions, particularly the fact that severe genetic inequalities between individuals leads to pervasive socio-economic inequalities. His initial response to the perceived shortcomings of the Rawlsian theory is to develop what he calls the "lax genetic difference principle" (LGDP). The LGDP extends the reasoning offered by the

[409] Farrelly, C. (2007). "Genetic Justice Must Track Genetic Complexity." *Cambridge Quarterly of Healthcare Ethics*, 17(01), -. Page 48

difference principle to genetic constitutions and puts the following constraint on inequalities in the distribution of natural talents:

> *"inequalities in the distribution of genes important to the natural primary goods are to be arranged so that they are to the greatest reasonable benefit of the least advantaged"*[410]

This principle has been recently modified and replaced with the "Lax Biologically Difference Principle"[411] Lax BPD henceforth. The only difference is that here Farrelly replaces the "distribution of genes" with "biological capacities" in order to capture the other features of our biology, in addition to genes, that have a role in realising the natural primary goods. Otherwise, the justification and rationale for the principle itself remains the same.

It is considered a lax principle because it avoids giving absolute preference to the interests of those most disadvantaged in their biological make-up. Replacing the absolute priority with a reasonable priority avoids falling into a situation where available resources are depleted in an effort to improve the situation of those most in need from a genetic perspective. As the situation of the worst off improves, our duty towards them, Farrelly claims, declines. Defending an absolute version of the genetic difference principle would have meant that "a small gain to the genetically disadvantaged is more important than a great loss to both the socially disadvantaged and advantaged."[412] Ignoring the plight of others that could be considered disadvantaged in other ways might create new inequalities where none might have existed. This would lead to the replacement of one least advantaged group with another that, perhaps, ends up even worse off. Furthermore, Farrelly does not believe that genetic or biological inequalities caused by inequalities in access to biotechnology are to be eliminated since, maintaining these differences in native talents, could lead to increases in economic productivity and incentives in the development of new technologies that will eventually benefit the least advantaged.

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[410] Farrelly, C. (2002). "Genes and Social Justice: A Rawlsian Reply to Moore." *Bioethics*, 16(1), 72-83. Page 81

[411] Farrelly, C. (2016). *Biologically Modified Justice*: Cambridge University Press.

[412] Farrelly, C. (2004). "The Genetic Difference Principle." *American Journal of Bioethics*, 4 (2). Page 26

However, not all genes and their distribution are treated equally under Farrelly's account. He is only concerned with those genetic dispositions that will develop the potential of the natural primary goods as defined by Rawls namely, health, vigour, intelligence and imagination.

Whilst the Rawlsian difference principle was only concerned with the distribution of social primary goods, Farrelly proposes a version that only deals with the genetically and biologically modifiable characteristics of natural primary goods. Furthermore, whilst the currency used in the difference principle is wealth and income, Farrelly changes Rawls's account by replacing social with natural primary goods, more specifically, with their natural potentials for acquiring natural primary goods.

Linked to this change in currency, we find another departure from the Rawlsian difference principle in Farrelly's definition of the least advantaged. This representative group is defined by Farrelly in terms of natural endowments whereas Rawls uses levels of authority and wealth to identify those most vulnerable in society. Rawls was very aware of the difficulty of measuring who would fall within the least advantaged group and chose wealth and income to identify this group and make interpersonal comparisons. Additionally, Farrelly does not define the least advantaged in relative terms. Rather, the genetically disadvantaged is the one with the lowest level of genetic endowments. As an example of who might be included within the least advantaged group, he suggests those "with disease or at a high risk of developing disease."[413] The closer this group gets to a species typical functioning, the lower the requirements of justice are towards them.

Having identified the least advantaged and developed the principle for governing the inequalities in the gene distribution, Farrelly needs to address how to tackle these inequalities taking into account scarce existing resources. Deciding how to allocate these resources amongst competing social goods is what Farrelly calls "The Problem of Weight."[414] Balancing what a society is going to spend on achieving genetic equality vs. the demands on healthcare, education or economic equality

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[413] Farrelly, C. (2016). *Biologically Modified Justice*: Cambridge University Press. Page 140

[414] Farrelly, C. (2004). "The Genetic Difference Principle." *American Journal of Bioethics*, 4 (2). Page22

might make the implementation of genetic cognitive enhancements an impossibility. Apart from the public financing of education and basic healthcare, resources are also needed to maintain the physical infrastructure of our communities and to ensure that pensions and benefits are not put in jeopardy should we decide to embrace these new technologies.[415] The reality of this scarcity of resources would, according to Farrelly, make genetic egalitarianism collapse into some kind of sufficientarianism or prioritarianism. Settling for what might be considered a genetic decent minimum is however not an acceptable option for Farrelly who claims that such a solution "might be of use in a society that already satisfied a decent minimum of other goods (e.g., housing, education, nutrition, wealth, etc.) and already possessed a vast supply of genetic therapies. But no society in this world is like that."[416] Farrelly's answer to these concerns is to assess the potential implementation of genetic interventions according to three main criteria. First, the means used for the intervention will need to be rationally connected to the objective. Second, attempts will be made to violate the reproductive freedom of the individual as little as possible. Third, there has to be some sort of proportionality between costs and benefits achieved though the intervention.

The point Farrelly makes about reproductive freedom betrays another departure from the Rawlsian thought. Farrelly does not adhere to the lexical priority that Rawls gives to his principles of justice. Basic liberties are not granted priority over considerations of efficiency or opportunity. His proposal involves balancing the demands of preserving reproductive freedom against a duty to prevent harm via what he calls the "Reasonable Genetic Intervention Model."[417] Issues of reproductive freedom under Farrelly's account are secondary to the interests of the genetically disadvantaged. Restrictions on the reproductive freedom of parents would be justified if it related to "concerns which are pressing and substantial in a free and democratic society"[418]. Rights and liberties do not trump other societal

[415] Ibid. Page 26

[416] Ibid.

[417] Ibid. Page 26

[418] Ibid. Page 27

considerations, they are just one of many considerations to be taken into account when we make decisions about the permissibility of genetic interventions.

Farrelly endorses the use of the LaxBDP as a way to help balance the prioritarian commitments with other competing societal demands. Under a non-ideal framework, he uses the idea of genetic endowments as part of a biological account to define the least advantaged representative group. This departure from the non-ideal setting has two main implications for how he deals with the distribution of societal resources. First, the least advantaged no longer get absolute priority; second, the priority given to basic rights of liberties does not prevail over other societal considerations.

Next, I will outline the differences between Farrelly's and my approach in dealing with differences in natural talents.

5.8.1 Differences in the distribution of genetic cognitive enhancements, Reflecting on Farrelly's account

Farrelly's approach can be contrasted with the account I have presented for the assimilation of genetic cognitive enhancements within the Rawlsian framework in a number of ways.

The definition he provides of the least advantaged group is perhaps one of the clearest diversions from my account. Farrelly identifies the least advantaged with those who fare worst in terms of natural primary goods. This might seem an unnecessary change to the Rawlsian account since Rawls himself seems to assume that those possessing lower economic shares will usually also be most disadvantaged from a genetic perspective.[419] Admittedly, this correlation may not always present itself, particularly once we drop the normal functioning assumption. However, by defining his account in this manner, he risks diverting social resources to citizens who, although severely impaired, do possess a high amount of economic shares, whilst those on very low incomes are not receiving the societal resources

[419] Rawls, J. (1999b). "A theory of justice - Revised Edition." *Harvard Univ Pr*. Page 83

they need. A fuller account of the least advantage group may eliminate this counterintuitive outcome.

Farrelly's account on the distribution of genetic make-up having as a reference point those with fewer native talents, means that his account is one concerned with departures from normal functioning. Rather than dealing with enhancements that improve functioning beyond a given normal level, Farrelly's approach seems to collapse into an account of how best to distribute healthcare resources to meet the requirements of those who need them the most. This is emphasised by his suggestion that inequalities in the distribution of natural talents can be addressed through the regulation of the distribution of a variety of social goods. These might include genetic technologies but also education or indeed economic resources.[420] His distributive principle fails to provide the guidance needed for the distribution of genetic enhancements designed to take the individual beyond the normal functioning level. This means that the issue of genetic technologies remains largely unanswered.

My thesis focuses on whether the Rawlsian theory is equipped to deal with potential distributional issues originating from the emergence of genetic cognitive enhancements themselves. It is the distribution of these technologies as social primary goods that are the focus of my account. Conversely, Farrelly is concerned with biological characteristics and then uses a range of social primary goods to address shortcomings in the distribution of these natural characteristics. Consequently, my approach avoids having to make any assessment on the biological status of the individuals and therefore avoids having to evaluate who might be the most biologically deprived before making any allocation decisions.

Related to this focus on natural capacities is the deconstruction that Farrelly makes of the Rawlsian difference principle. Farrelly's difference principle is applied to genetic considerations alone making it unclear how the interests of other members of society disadvantaged in a non-genetic way will be met. Furthermore, Farrelly is ambiguous in relation to how and whether the least advantaged should be prioritised over other members of society. For instance, when discussing the

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[420] Farrelly, C. (2004). "The Genetic Difference Principle." *American Journal of Bioethics*, 4 (2).

distribution of societal resources, Farrelly affirms that some consideration also needs to be given to "those who have both favourable genes and social environment" but could, all the same, benefit from quality public education.[421] It is unclear what the strength of this consideration should be and how we are to prioritise accordingly. The Lax BDP offers no guidance on how to distribute resources among different disadvantaged groups.

My discussion of these new technologies assumes that the idealised conditions of normal functioning and moderate scarcity, set by Rawls, hold. Conversely Farrelly moves his theory to the non-ideal setting inevitably leading him to focus his discussion on issues closer to therapy than enhancement. Furthermore, in his attempt to make his theory applicable to the reality of non-ideal societies, he largely leaves the content of his principle indeterminate and without clear guidance on how to balance competing demands.

Finally, I consider Farrelly's failure to grant protection to basic rights and liberties particularly problematic from a Rawlsian perspective. In non-ideal circumstances of scarcity and pervasive inequalities this protection is essential to ensure that access to these technologies do not result in excessive accumulations of wealth and power. Recall that the Lax BDP does not rank itself in relation to other principles protecting rights, duties or liberties. Instead, society is supposed to balance the distributional demands of the Lax BDP against the need to protect rights and liberties as and when they arise. The indeterminacy of the guidance provided by his "reasonable genetic intervention model" makes it unclear which demands of justice should prevail. Although these are considered by Farrelly as common sense rules, there seems to be too high a level of indeterminacy to be able to apply these principles in non-ideal conditions, as was his objective. The Rawlsian principles protecting basic rights and liberties and access to opportunities could have easily been transferred to the non-ideal setting in order to avoid these potential societal problems.

[421] Ibid. Page 25

5.9 Conclusion

A detailed analysis of the impact of genetic cognitive enhancements on basic rights and liberties, opportunities and socio-economic inequalities has shown that these concerns can be addressed from within the framework of the Rawlsian political conception of justice. Throughout, I have maintained that these interventions do not compromise the principles of justice. If these technologies do not undermine the principles of justice, their introduction may be permitted from the viewpoint of justice.[422.]

Moreover, they might help towards achieving the goal of equality that underpins Rawls's defence of the two principles of justice. Given their role as primary goods and how they facilitate access to jobs and positions, I argue that any legal barriers to access to these technologies need to be removed. Citizens must not be stopped from acquiring these goods on the basis of morally arbitrary factors such as gender, creed, genetic make-up or occupation.

The Rawlsian answer to the social justice effects of the unfettered introduction of genetic cognitive enhancements must not be interpreted as one that appeals to one single principle of the political conception. Each of the principles fulfils its very own distribution role and has an impact on the restrictions imposed by the other principles. First, the protection given to liberties and the access to opportunities will prevent damaging concentrations of wealth at the hands of the few. Second, the priority given to the FEO principle over the distribution of economic goods will avoid the entrenchment of inequalities within specific economic classes and across generations by ensuring that economic gains are redirected towards educational and cultural resources. Third, wide economic inequalities will also be restricted in order to preserve the social bases of self-respect.

The Rawlsian principles are therefore not to be assessed in isolation on how effectively they deal with newly emerging technologies, rather, they all work

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[422] I follow David Resnik who asserts that permissibility is genetic enhancement is contingent on their not undermining the Rawlsian principles of justice. Resnik, D. B. (1997). "Genetic engineering and social justice: a Rawlsian approach." *Social theory and practice*, 23(3), 427-48. Page 444

together pulling towards equality and reciprocity. Rawls himself warns us about interpreting the potential effects of the difference principle in isolation:

> *"The requirements of the prior principles have important distributive effects. Consider the effects of fair equality of opportunity as applied to education say, or the distributive effects of the fair value of the political liberties. We cannot possibly take the difference principle seriously so long as we think of it by itself, apart from its setting within prior principles."*[423]

The chapter continues with the proposal that genetic cognitive enhancements may broaden the range of opportunities open to individuals and help to promote equality. These technologies will help to widen access to available opportunities, particularly to the least advantaged and strengthen the work done by the difference principle to minimise any resulting inequalities in wealth and income. Enhanced cognitive capacities might lead to better educational outputs which in turn may result in the widening of opportunities open to individuals. As a result, the access to more desirable positions may result in a higher share of socio-economic goods for the individual. The social product available for distribution under the difference principle may also itself increase through a rise in productivity and the generation of network effects.

Finally, I conclude that my account for the incorporation of genetic cognitive enhancements within the Rawlsian framework is distinct from both Norman Daniels's extended version of the FEO principle and Colin Farrelly's lax biological difference principle. First, my account keeps faithful to the normal functioning ideal established by Rawls. In adhering to this condition, I am able to explore the implications for the Rawlsian theory of taking the cognitive capacities of citizens beyond what is required for them to be considered fully functioning citizens. Second, whilst Daniels's account requires the establishment of new background institutions to deal with the distribution of health needs, my account requires the extension of the FEO to include the removal of barriers of access to genetic cognitive enhancements. Third, Farrelly's definition of the least advantaged is only based on natural primary goods allocations. I retain Rawls's definition of the least advantaged

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[423] Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press. Page 46(n)

whilst incorporating genetic cognitive enhancements as additional primary goods to be added to the Rawlsian index. Fourth, whilst Farrelly's focus aims to address issues in the distribution of natural talents, I focus on the distribution of genetic enhancements in their role as primary goods. These differences in approach highlight my attempts to keep faithful to Rawls's writings by working within the limits set by the ideal theory.

Chapter 6. Genetic moral enhancements and their relationship to social justice: An assessment of their contribution towards the stability of the Rawlsian society

The previous two chapters have shown how genetic cognitive enhancements can be accommodated within the Rawlsian framework. This extension to Rawls's theory was justified firstly on account of how these technologies met the conditions required of primary goods and secondly by demonstrating that, not only they did not contravene the principles of justice, but they had the potential to strengthen access to opportunities and increase the social product available for distribution under the difference principle.

My enquiry is now extended to a set of genetic interventions designed to potentially augment the natural moral capacities of **empathy** and **sense of fairness**. I explore whether, in line with Rawls's writings on moral psychology, the enhancement of these capacities can contribute towards securing the stability of the well-ordered society.

Having developed principles of justice designed to regulate economic inequalities and to protect basic rights and liberties and access to opportunities, Rawls's concern turns to demonstrating that the well-ordered society will be stable. The well-ordered society will need to be shown to endure across time, and ideally, across future generations. It is then vital that the chosen political conception, not only contains principles that are in line with the moral convictions of modern democracies, but that they also engender the appropriate moral motivation to secure the stability of society.

This chapter begins by defining the role of stability in the Rawlsian theory of justice and providing a brief outline of the evolution of different strategies Rawls developed to justify this stability. Rawls's understanding of stability centres on the ability of the political conception to generate its own support.[424] I interpret the problem of stability as having two main components. The first concerns the development of the sense of justice as the motivational pull for citizens to affirm the principles of justice.

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[424] Ibid. Pages 124-125

The second concerns how this motivation can be sustained over time to secure a lasting well-ordered society.

After a brief description of the model of moral psychology endorsed by Rawls, I outline how the natural moral capacities of empathy and a sense of fairness relate to Rawls's understanding of natural attitudes, moral sentiments and political virtues, such as the sense of justice. I propose that these capacities have a role in the moral development of individuals eliciting the required moral sentiments. This is the same role that Rawls attributed to the natural attitudes for love, mutual trust and friendship. Showing that these capacities could be part of the Rawlsian model is the starting point for a later argument in support of their enhancement through germline engineering.

After a quick review of the congruence argument developed in *A Theory of Justice*, I focus on Rawls's justification of stability provided in his later writings after he finds that this perfectionist account of stability, requiring justice to be part of the individual's good, is not compatible with the political scope of his theory. Rawls's answer to the stability problem relies now on the ability of the political conception to be the focus of an overlapping consensus amongst a plurality of reasonable comprehensive views.

Next, I consider two challenges faced by the type of enduring stability sought by Rawls in *Political Liberalism*. First, I discuss the challenge of non-compliance caused by reasonable and unreasonable comprehensive views and their competing demands. Second, I consider the failure to develop an adequate sense of justice caused by the lack of appropriate natural attitudes and by the failings of the family as the main institution responsible for the child's moral development.

I conclude by arguing that the challenges to stability may lead Rawls to review his theory in substantial ways prompting him to consider one or more of the following options: enhancing the citizens' sense of justice by biomedical means; revising the principles of justice; or relaxing the requirement for stability.

6.1 The problem of stability, a constant through the Rawlsian writings.

Answers to the challenge of stability in the well-ordered society are first developed by Rawls in *A Theory of Justice* and revised in later writings, particularly in *Political Liberalism*. Throughout his writings Rawls aims to demonstrate that a society governed by his two principles of justice, chosen during the development of his justice theory, are able to secure a lasting, just and peaceful society over time. Stability is understood as a type of equilibrium, whereby people consistently act according to the precepts of justice in the knowledge that everyone else also acts justly. This equilibrium ensures that, even though institutions and social conditions may change over time, the justice of the basic structure and how this is affirmed by citizens will largely remain unchanged.[425]

Even though Rawls tackles the issue of stability differently in his early and later writings, his concern remains the same throughout. We can find references to stability and its role in the feasibility of the political conception all through the two stages of the development of justice as fairness as a political conception. These two stages of Rawls's social contract theory are first mentioned in *The Sense of Justice.*[426] This early paper, written eight years prior to the publication of *A Theory of Justice*, gives us a first glimpse of Rawls's derivation of the principles of justice and the subsequent issue of citizens adhering to and affirming these principles. Rawls highlights here the significance of the problem of stability where we are warned that the derivation of the principles of justice, through the analytic construction, does not suffice, we also need to show that the just society will last:

> *"The aim of this analytic construction is to derive the principles of justice which apply to institutions. How persons will act in the particular circumstances when, as the rules specify, it is their turn to do their part is a different question altogether."*[427]

It is this "different question altogether" that now deals with the possibility of achieving a stable society making this the next stage in Rawls's theory. Predicting

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[425] Rawls, J. (1971). *A theory of justice*: Belknap Press. Pages 457-458

[426] Rawls, J. (1963). "The sense of justice." *The Philosophical Review*, 281-305. Pages 283-285

[427] Ibid. Page 285

how people will behave troubles Rawls and leads him to consider whether adherence to the principles can be realised. The issue of stability means that Rawls needs to show that his is a lasting society where everyone accepts and knows that others accept the same principles of justice and that the basic social institutions satisfy, and are largely known to satisfy, these principles. Stability is seen by Rawls as part of the justification that the chosen conception of justice is correct. The process of choosing a conception of justice will not be complete unless its feasibility can be demonstrated:

> *"The argument for the principles of justice is not complete until the principles selected in the first part (stage) are shown in the second part (stage) to be sufficiently stable"*[428]

The justificatory role given to stability seems to be crucial to the success or failure of the political conception, so much so that should there be another set of principles that fulfil this condition better, they should be chosen instead:

> *"However attractive a conception of justice might be on other grounds, it is seriously defective if the principles of moral psychology are such that it fails to engender in human beings the requisite desire to act upon it."*[429]

It could be argued that the problem of stability could rapidly be solved thorough the establishment of penalties to punish any potential de-stabilising behaviours. This might be justified by the fact that the principles of justice chosen are themselves considered to be fair. However, this is not the kind of stability that Rawls believes secures the long term viability of the well-ordered society. Stability is not to be secured at all costs, it needs to be secured for the right reasons.

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[428] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 141

[429] Rawls, J. (1999b). "A theory of justice - Revised Edition." *Harvard Univ Pr*. Page 455

6.1.1 Stability for the right reasons

Rawls is careful to contrast his account of stability with two other approaches found historically across different societies. One way to achieve stability is represented by the enforcement of state oppression; the other one takes the form of a "modus vivendi".

An example of state enforced obedience in social cooperation is the contractual model devised by Hobbes.[430] Under this system, non-conformity to the principles of justice is met with governmental intervention where "the sovereign maintains and stabilises the system of social cooperation by publicly maintaining an effective schedule of penalties."[431] Despite the potential effectiveness of this approach, the use of oppression however, could not be justified in a society characterised by its non-voluntary membership. In his writings, Rawls assumes throughout that citizens belong to a society they do not themselves choose, entering at birth and exiting at death. This non-voluntary membership makes the use of coercive powers that force citizens to accept a comprehensive doctrine they did not choose deeply unjustified.

An alternative to this state-enforced type of stability is stability achieved via a "modus vivendi". In this case, those holding conflicting views reach an agreement and settle for a peaceful civil society rather than living in an unstable and unpredictable state of nature. This agreement leads to a "modus vivendi"[432] where citizens, whilst often having conflicting interests, comply with a conception of justice as the best possible alternative given their current conditions and distribution of power. The danger of a society characterised by a modus vivendi is that shifts in the power held by different groups are likely to have a de-stabilising effect and may lead to the domination, caused by the change in circumstances, of those who are least advantaged.

Both the state-enforced and modus vivendi approaches to stability are unsatisfactory for Rawls. He is concerned not only with stability, but also with how stability can be achieved and sustained over time respecting liberal principles. This

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[430] Hobbes, T. (2006). *Leviathan*: A&C Black.

[431] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 346

[432] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Pages 458-459

is not the kind of stability that either one of the two approaches just described can offer. Rawls aims to achieve "stability for the right reasons" redefining the problem of stability as:

> *"…not that of bringing others who reject a conception to share it, or to act in accordance with it, by workable sanctions, if necessary, as if the task were to find ways to impose that conception on others once we are ourselves convinced it is sound, rather, as a liberal political conception, justice as fairness relies for its reasonableness in the first place upon generating its own support in a suitable way by addressing each citizen's reason as explained within its own framework."*[433]

Rawls's political conception needs to be capable of appealing to citizens and securing their support. This appeal is such that people with diverse conceptions of the good and very different starting places in life adhere to the principles of justice even when it goes against what they might perceive to be their best interest. This is a more substantial and demanding type of stability rooted in the moral principles that have been chosen under conditions of fairness. It requires a different kind of moral commitment from its citizens, an un-coerced moral sentiment,[434] as the motivating force for acting upon the sense of justice that leads citizens to support and affirm the principles of justice. Moreover, these principles of justice are meant to be "final and made in perpetuity."[435] In other words, the support for these principles will not falter over time due to external contingencies or changes in the distribution of power amongst different groups.

The political conception needs to be capable of engendering in citizens a willingness and desire to comply by and support the principles of justice ruling the basic institutions. As Brian Barry accurately highlights, Rawls's aim is to prove "the existence of appropriate motivation for doing what justice requires."[436]

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[433] Ibid. Page 143

[434] The principles of justice "must be willingly and freely supported by at least a substantial majority of its politically active citizens" ibid. Page 38.

[435] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 177

[436] Barry, B. (1995). "John Rawls and the search for stability." Page 875

From the above we can infer that the problem of stability, as Rawls defines it, rests on the actual content of the political conception, the moral psychology of individuals and whether citizens can find strong enough reasons to consistently act in accordance to justice.

In order to fully understand Rawls's account of stability this chapter proceeds as follows. First, I outline the Rawlsian account of citizens' moral psychology. Second, I summarise the reasons why Rawls believes this motivation will persist across time, hence securing the stability of the well-ordered society. Whilst his account of moral psychology remains largely unchanged throughout his writings, his account of how this motivation is secured changes over time from *A Theory of Justice* to his final account in *Political Liberalism*.

6.2 The acquisition of a sense of justice – A brief introduction to the Rawlsian model of moral psychology.

In order to understand the type of motivation that stability for the right reasons requires, we need to first have a closer look at the development of the moral sentiments of citizens in the well-ordered society. This section also explores whether the natural capacities of empathy and a sense of fairness can play a role in Rawls's account of moral psychology. First, I propose that they should be given the same consideration to that granted to love, mutual trust and friendship. This is justified by the role they have in the development of the sense of justice.

Rawls remains faithful throughout his writings to the model of moral psychology developed in *A Theory of Justice.* The entirety of chapter 8 in *A Theory of Justice* is devoted to the development of a sense of justice, which serves as the main motivation for citizens to act in accordance with the principles of justice.

A sense of justice is defined as "a normally effective desire to act upon the principles of justice, at least to a minimum degree."[437] Its development is grounded in Rawls's theory of moral psychology, which in turn is inspired by the empiricist and

[437] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 505

rationalist theories of moral development and developmental psychology.[438] A sense of justice is a kind of moral sensibility, whose development presupposes the possession of certain natural attitudes and the existence of adequate social conditions. Rawls describes a path for the acquisition of a sense of justice in the well-ordered society which takes the reader from its inception in childhood to its fully developed stage in adulthood. The sense of justice is acquired through three stages of moral development, each characterised by a specific moral law.

The first stage identified by Rawls leads to a "morality of authority". During this phase the child has her parent, almost exclusively, as the only reference of moral behaviour. Characterised by the bond between parent and child, this stage sees the development of feelings of affection and trust in the child that will guide her moral behaviour. The love the child feels for her parents is exclusively motivated by her recognition of the love and affection that she is being given. Because of their closeness to their parents, young children care more about their parents feelings than others in their environment.[439] These feelings develop further as the child's sense of worth is nurtured by the parental relationship, which helps her internalise the moral precepts she has been exposed to in the familial environment.

In this case the first law of moral development states that:

> *"given that family institutions are just, and that the parents love the child and manifestly express their love by caring for his good, then the child, recognizing their evident love of him, comes to love them."*[440]

Rawls is trying to model the family and subsequent environment of the citizen as a mini just society. He assumes that the structures surrounding the child are just. The family members will exhibit the type of just behaviours that the child will later encounter in educational institutions and society at large. If we learn stage by stage to develop sentiments of justice towards those who love us and behave fairly with

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[438] Rawls is inspired by the works of Rousseau, Mill and the works the moral development models of Piaget an Kohlberg. Ibid.Pages 459-463

[439] Moreno, A. J., Klute, M. M., and Robinson, J. L. (2008). "Relational and individual resources as predictors of empathy in early childhood." *Social Development*, 17(3), 613-637.

[440] Rawls, J. (1971). *A theory of justice*: Belknap Press.Page 492

us, these sentiments can then easily be extended towards those citizens of a society where just behaviours are common place.

The second stage of moral development is dominated by a "morality of association". At this point the child's relationship circle is extended, with the family unit becoming just one of various small associations that are part of the child's daily life. The law governing this stage differs from the first law insofar as:

> *"given that a person's capacity for fellow feeling has been realized by acquiring attachments in accordance with the first law, and given that a social arrangement is just and publicly known by all to be just, then this person develops ties of friendly feeling and trust toward others in the association as they with evident intention comply with their duties and obligations, and live up to the ideals of their station."*[441]

Through her relationship with new groups, the child increases her moral learning, recognising different behaviours displayed by those holding different positions of authority, understanding the role of cooperation, accepting diverging points of view and recognising how others equally accept and recognise her own perspective. Whilst the first stage of development was largely characterised by the obedience owed to parental dictates and motivated by feelings of love, the morality of association focuses on the development of cooperative behaviour and the beginnings of a desire to act according to the precepts of justice.

The last stage of moral development is defined by Rawls as the "morality of principles". The individual, now a young adult, engages in the most complex forms of association and develops a genuine concern for how her moral conduct is being perceived by others. The requirements of justice are internalised by the individual, that is, having experienced fairness and respect from others the young adult will act upon and adhere to the principles of justice. This development in the moral behaviour of individuals is encapsulated in the third law of morality:

> *"given that a person's capacity for fellow feeling has been realized by his forming attachments in accordance with the first two laws, and given that a society's*

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[441] Ibid. Page 492

institutions are just and are publicly known by all to be just, then this person acquires the corresponding sense of justice as he recognizes that he and those for whom he cares are the beneficiaries of this arrangement"[442]

This final stage represents the realisation that we need to support the institutions that have contributed to the fruitful cooperation gained in our relationship with others, even when we don't have any affective ties with those also involved in social cooperation.

These stages show the moral journey taken by the individual from childhood where, through the love and nurture offered by the family, she develops true feelings of affection towards her parents. As she becomes involved in more complex associations at school, play groups or other social organisations she witnesses reciprocal behaviours of trust towards her, which stimulate a capacity for trust and responsibility that will eventually be extended to those with whom she has no particular affiliation. This moral development culminates in a fully developed sense of justice as these feelings of trust and empathy extend to a degree that compels the individual to abide by institutional arrangements in the knowledge that others do too.

Having acquired an understanding of the moral process undertaken by the individual, the next step involves scrutinising the natural attitudes involved in this process. Once we understand the function that Rawls gives to these natural attitudes, I evaluate whether the natural attitudes of empathy and a sense of fairness can also be part of this moral development process.

6.2.1 Empathy, a sense of fairness and the innate attitudes constitutive of the Rawlsian account of moral development.

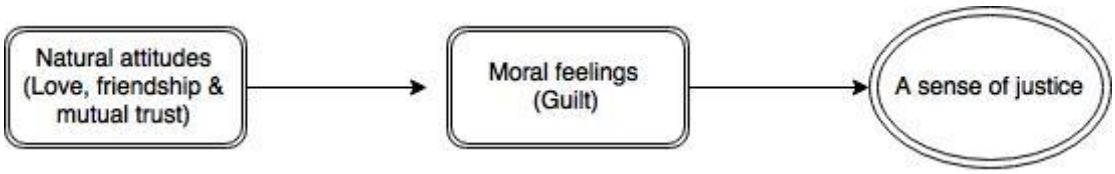
Through the process of moral development the individual's natural moral attitudes are being nurtured and developed as the child witnesses reciprocal and mutually beneficial behaviours in social cooperation. Rawls recognises here that there is a set of natural dispositions that enable the development of appropriate moral feelings and drive us to act in accordance to the precepts of justice. The innate nature of

[442] Ibid. Page 493

these attitudes is made explicit by Rawls when he describes the set of natural capacities that individuals are presumed to have and that are a constitutive part of the development of the sense of justice in individuals. The capacity for a sense of justice is supposed to include as constitutive components "the capacities of feeling, attitude, and conduct, mentioned in the three laws of the psychological construction." [443] These natural attitudes rely on the well-ordered society to provide the appropriate environment that turns them into moral sentiments or feelings. It is these moral sentiments that will lead us to display just behaviours which are quite independent of our own personal circumstances and that extend beyond our relationship with those with whom we have directly engaged in mutually advantageous cooperation.

The flowchart below illustrates how this process evolves during the moral development stages:

Figure 2 – From natural attitudes to a sense of justice



Natural attitudes of love, friendship and mutual trust, Rawls believes, are attitudes that everyone has and they are responsible for the manifestation of feelings of guilt or indignation, when the duties and obligations towards us or those we care about are not met. The capacity for a sense of justice can be said to develop from the moral sentiments which have arisen from the natural attitudes innate to the individual.

I argue that the natural capacities of empathy and a sense of fairness are closely related to the natural attitudes identified by Rawls and should be included in this

[443] Rawls, J. (1963). "The sense of justice." *The Philosophical Review*, 281-305. Pages 300-301

process. Not only are they innate but they give rise to the moral sentiments that Rawls considers are needed for the development of a sense of justice.

Now, this thesis has already explored how there are reasons to believe that some capacities, linked to our ability to display fair behaviours and be guided by the precepts of justice, are thought to have a genetic component. This genetic characteristic will make them "natural" or "innate" in the same way love, friendship and mutual trust are regarded by Rawls. The next step is to show that they can fit within the Rawlsian moral development scheme and fulfil the moral sentiment evoking role that Rawls allocated to love, mutual trust and friendship.

Empathy and **a sense of fairness** are both examples of these innate capacities and they have the potential to foster the type of behaviours Rawls would regard as useful in the adequate development of a sense of justice. When assessing the role of natural attitudes in the development of a sense of justice, Rawls assumes that there is an internal relationship between the emotion of guilt and the natural attitudes of love, friendliness and mutual trust. He uses guilt as a sign that denotes the existence of these natural attitudes and that ultimately results in an emerging sense of justice. This relationship between the emotion or feeling (guilt) and the natural attitude (for example love) is so fundamental that, Rawls believes, you could not have one without the other:[444]

> *"the existence of love and trust for those in authority implies feelings of guilt for violating authoritative injunctions, and that the absence of such guilt feelings implies the absence of the natural attitudes of love and trust. Similarly in the context of associative arrangements, the natural attitudes of friendship, affection and mutual trust imply feelings of guilt for recognised violations of duties of fair play, and the absence of such guilt feelings implies an absence of the natural attitudes of friendship, affection and mutual trust"*[445]

If the emotion of guilt is a sign for the existence of a natural attitude that causes it, I argue Rawls should add to his list the natural capacities of empathy and a sense of

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[444] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 489

[445] Rawls, J. (1963). "The sense of justice." *The Philosophical Review*, 281-305. Pages 296-297

fairness. To substantiate this claim, next I outline how the capacities for empathy and a sense of justice can give rise to emotions of guilt that will in turn contribute to the development of a sense of justice.

Looking at empathy first, I interpret this capacity as one's identification with someone else's plight:

> *"empathy (particularly in the sense of sympathetic concern) prompts us to feel the pain of others and to align their interests with our own."*[446]

Empathy entails the ability to imagine and identify with other people's feelings and it acts as a motivator to help others in need. Empirical evidence[447] indicates that children as young as two are thought to display empathy related behaviours towards others, offering help, comfort and sharing behaviours towards those thought to be in distress. At this young age, these displays of empathy seem to heavily depend on how closely related they are to the person in distress. The natural capacity for empathy will be further strengthened by the extended affective ties developed during the first and second stages of Rawls's moral development account. The child's capacity for empathy will progressively become more sophisticated in how they understand and respond to the psychological states of those with whom they engage in social cooperation. Just like the attitudes of love and friendship, a capacity for empathy may provide the child with the necessary motivation to accept outcomes that do not necessarily improve her current situation. Rawls believes that at an early age, feelings of "authority guilt"[448] caused by the innate love the child has towards her parents will appear when the child fails to comply with her parents' precepts. This emotion of guilt, I argue, is also likely to arise out of the feelings of empathy that the child has towards her parents. As the child grows feelings of friendship work together with that innate love and lead to "association guilt"[449] when and if children fail to do their part in social cooperation.

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[446] Pinker, S. (2011). *The better angels of our nature: The decline of violence in history and its causes*: Penguin UK. Page xxiv

[447] Zahn-Waxler, C., and Radke-Yarrow, M. (1990). "The origins of empathic concern." *Motivation and emotion*, 14(2), 107-130.

[448] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 465

[449] Ibid. Page 470

Feelings of love and friendship are then part of the motivational pull that children have to act fairly when they engage in social cooperation. Failing to act justly will generate feelings of guilt that would force them back into the just path. There is no reason to believe however that the natural capacity for empathy cannot give rise to feelings of guilt just as love and friendship do when we fail to act in a morally just way. This failure to act against our empathic inclinations gives rise to feelings of guilt which Rawls takes as a sign of successful moral development and resulting from having acted contrary to "the sense of right and justice."[450]

It follows that these feelings of guilt are a sign of development of a capacity for a sense of justice. This indicates that empathy can have a contributory role to the moral development of the child. This is perhaps not surprising since empathy is often presented as a key motivational force in the development of just behaviours, the ability to recognise ourselves in others and identify with their plight can often provide enough reason to act by the principles of fairness.[451] Furthermore, not only will failure to act on our empathic attitudes give rise to emotions of guilt, but also guilt can often be taken as a sign of empathic tendencies. Research has shown that individuals who tend to feel guilt are also more likely to display greater empathy with a better ability to identify emotions such as sadness, happiness or anger in others.[452]

Focusing on the capacity for a sense of fairness leads to similar conclusions. I suggest that this natural attitude is a constitutive part of the moral development of the child in all stages of social cooperation.

The capacity for a **sense of fairness** brings an ability to recognise reciprocal behaviours and a disposition to act in reciprocal ways whenever this is appropriate. In a sense, it relates to the more primeval "tit-for-tat" strategies explained by evolutionary biologists and present not only in humans but also in other animals as

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[450] Ibid. Page 445

[451] Decety, J., and Cowell, J. M. (2015). "Empathy, justice, and moral behavior." *AJOB neuroscience*, 6(3), 3-14.

[452] Treeby, M. S., Prado, C., Rice, S. M., and Crowe, S. F. (2016). "Shame, guilt, and facial emotion processing: initial evidence for a positive relationship between guilt-proneness and facial emotion recognition ability." *Cognition and Emotion*, 30(8), 1504-1511.

a usual form of social co-operation. There is empirical support for the role of a sense of fairness in the moral development of the infant. Babies as young as 18 months display behaviours consistent with a disposition towards fairness indicating that "moral evaluations and pro-social behaviour are heavily interconnected from early in development."[453] Other studies revealed how 5 months and 8 month infants favour individuals who display pro-social behaviours towards others and reject and behave negatively towards those seen to display antisocial behaviours.[454] These findings are in line with Rawls's belief about the biological nature of this type of reciprocal responses. In *A Theory of Justice,* Rawls claims that a tendency to answer in kind is a "deep psychological fact"[455] that has made social cooperation possible.

Our innate sense of fairness leads us to respond with gratitude to favourable behaviours and retaliate when someone harms us or behaves unfairly towards us or others close to us. Conversely responses of remorse and feelings of guilt emerge when we fail to reciprocate or harm others without good reason.[456] When failing to act upon our sense of fairness, once again the concept of guilt in the development of morality appears. As with empathy, this tendency to feel guilt and remorse prompted by our natural sense of fairness is recognised by Rawls. Feelings of guilt, Rawls claims, arise when we fail to accept the principles of justice that enable social cooperation:

> *"We want to do our part in maintaining these arrangements. We tend to feel guilty when we do not honour our duties and obligations, even though we are not bound to those of whom we take advantage by any ties of particular fellow feeling."*[457]

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[453] Schmidt, M. F., and Sommerville, J. A. (2011). "Fairness expectations and altruistic sharing in 15-month-old human infants." *PloS one*, 6(10), e23223. Page 1

[454] Hamlin, J. K., Wynn, K., Bloom, P., and Mahajan, N. (2011). "How infants and toddlers react to antisocial others." *Proceedings of the national academy of sciences*, 108(50), 19931-19936.

[455] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 494

[456] Persson, I., and Savulescu, J. (2008). "The perils of cognitive enhancement and the urgent imperative to enhance the moral character of humanity." *Journal of Applied Philosophy*, 25(3), 162-177. Pages 12-13

[457] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 474

The emotional response originating from the innate capacity for a sense of fairness is present both at an early age in the form of "authority guilt" and later on as "association guilt". In the third stage, "principle guilt" arises as the young adult is able to abstract from familial and affective ties within the framework of a well-ordered society and has developed a fully-fledged sense of justice.

Nurturing this innate sense of fairness by parental and other societal influences can be expected to have positive results in the successful development of the sense of justice.

Both the innate capacities for empathy and a sense of justice have been shown to contribute to the moral development of the individuals. These capacities evoke emotions of guilt when we fail to act upon them. These feelings of guilt serve both as a recognition by the individual of a failure to act upon precepts of justice and as potential motivator to act justly in the future.

The presence and development of these two natural capacities progressively equips the child with essential tools to engage in successful social cooperation and gives rise to feelings of guilt when the child fails to act in line with moral precepts.

6.3 The collapse of the congruence argument - The move from the comprehensive to the political.

The moral development in citizens described by Rawls is assumed to have led to a sufficiently developed sense of justice. Furthermore, the well-ordered society has been arranged according to fair terms of cooperation derived from shared political intuitions characteristic of modern democracies. This however will not suffice to secure the stability of the well-ordered society. Rawls still needs to show that citizens have reasons to consistently act justly in order to secure stability.

Rawls explores the nature of these reasons in *A Theory of Justice* and in *Political Liberalism*. Citizens, Rawls believes, may sometimes lack the assurance that others will act on their sense of justice, this in turn will make their motivation to act justly falter, thereby endangering the stability of society. Rawls's early discussions of stability in *A Theory of Justice*[458] maintain that there are independent reasons why

[458] Ibid. Pages 567 to 56

people would consistently act from and adhere to the principles of justice. These reasons are grounded on the congruence of justice with our good. This means that consistently acting according to their sense of justice, would be seen by individuals as consistent with their own good. Justice then becomes part of living well and hence generates the desired stability of the political system:

> *"the sense of justice coheres with the conception of our good so that both work together to uphold a just scheme."*[459]

Assuming the congruence argument is correct, citizens would have reasons to consistently act in accordance with their sense of justice, therefore securing the stability of society.

However, this justification of stability advocated in part III of *A Theory of Justice* is dropped altogether in later writings. Whilst maintaining the account of moral psychology that explains the acquisition of a sense of justice, Rawls believes that the diversity of moral, religious and philosophical views held by citizens makes the congruence of justice with the citizen's good no longer feasible. This leads Rawls to make two fundamental and closely connected changes to his political conception influencing his later account of stability.

First, Rawls believes that there is a necessity to recognise that the existence of pluralism in the views and beliefs held by citizens acts as a barrier for the endurance of a just society ruled by the principles of justice:

> *"The fact of a plurality of reasonable but incompatible comprehensive doctrines - the fact of reasonable pluralism – shows that, as used in Theory, the idea of a well-ordered society is unrealistic…..The account of the stability of a well-ordered society in part III is therefore also unrealistic and must be recast."*[460]

The presence of diverse comprehensive world views in modern democratic societies is the inevitable result of the citizens' free exercise of their judgement and reasoning. These views are reasonable insofar as, Rawls believes, they largely

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[459] Rawls, J. (1999b). "A theory of justice - Revised Edition." *Harvard Univ Pr*. Page 453

[460] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page xvii

accept the precepts of a democratic regime.[461] In a pluralistic society, a conception of justice justified on metaphysical assumptions about the good will inevitably fail to gain a sufficient number of adherents to render society stable. So, in his later work, Rawls sets out to find other reasons for citizens to consistently act upon their sense of justice.

Second, and further to the realisation that the plurality of views is a permanent feature of modern societies, Rawls recognises that the scope of his theory needs to be re-framed from having a comprehensive scope to one restricted to the political domain.[462]

It is his preoccupation with the fact of reasonable pluralism that leads Rawls to re-consider justice as Fairness and evaluate whether "in the circumstances of a plurality of reasonable doctrines, both religious and non-religious, liberal and non-liberal, a well-ordered and stable democratic government is possible"[463]. Reframing justice as fairness as purely a political conception that can be adopted and affirmed from very different points of view is Rawls's starting point for his revision of the arguments for stability.

Making this move from a comprehensive moral theory to a political one has the following conceptual implications:

> *"i), that it is framed to apply solely to the basic structure of society, its main political, social, and economic institutions, as a unified scheme of social cooperation; (ii), that it is presented independently of any wider comprehensive religious or philosophical doctrine; and (iii) that it is elaborated in terms of*

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[461] How these reasonable doctrines support the ideology common to modern democratic regimes is by not suppressing the basic rights and liberties affirmed by the political conception. Ibid. Pages 58-66

[462] The claim that justice as fairness is a comprehensive theory it is however by no means clear. This is in fact highlighted by Rawls's on comments in *A Theory of Justice'*, when he clearly differentiates between the right and the good in: Rawls, J. (1999b). "A theory of justice - Revised Edition." *Harvard Univ Pr*. Pages 446 and 447.

Brian Barry takes this as confirmation that Justice as Fairness is not a comprehensive doctrine and as such "compatible with a variety of comprehensive vie" Barry, B. (1995). "John Rawls and the search for stability." Page 878

[463] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page xxxix

fundamental political ideas viewed as implicit in the public political culture of a democratic society"[464]

The political scope of the principles of justice limits their application to the very specific subject of socio-economic and political institutions and not how we conduct other areas of our lives. Furthermore, this political conception is independent of any comprehensive doctrine; it's justification is not anchored on nor its content derived from a particular religious, moral or philosophical doctrine. Finally, the principles of justice are grounded in a set of fundamental ideas that are implicit in the political culture of modern democracies.

Demarcating the political conception in this way, Rawls believes puts less stringent demands on citizens to act according to the demands of justice and endorse the contents of the political conception. Rawls search for stability now depends on whether he can show how "the reasonable doctrines endorse the political conception each from its own point of view".[465]

Abandoning the congruence argument has two direct consequences for the Rawlsian argument for stability. First, there is a recognition that the fact of reasonable pluralism is a reality of modern societies that make it unrealistic for the good of citizens to always identify with the right of justice. Second, and due to this plurality of views, Rawls will need to seek a less demanding basis of justification that gains the commitment of citizens consistently and long term. The combination of these two factors led Rawls to review his account of stability concluding that reaching an overlapping consensus is the most feasible way to achieve the stability of the well-ordered society.

6.4 The political conception rendered stable as the focus of an overlapping consensus

Having dropped the idea that the individual good necessarily coincides with the demands of justice, Rawls revised his account of stability in *Political Liberalism.* The challenge of explaining how people holding deeply different and irreconcilable

[464] Ibid. Page 223

[465] Ibid. Page 134

religious, philosophical and moral views dominates the content of his later work. Rawls needs to show that citizens can consistently act upon their sense of justice despite the competing priorities arising from their own comprehensive doctrines.

Rawls holds that the fact of reasonable pluralism threatens the stability of the well-ordered society regulated by the principles of justice. In a society characterised by reasonable pluralism what is good for Jo does not coincide with what is good for Mary. Mary and Jo have different desires and metaphysical and ethical viewpoints. Therefore Rawls turns his attention towards providing an explanation to whether "the political conception can be the focus of an overlapping consensus"[466] This overlapping consensus entails that, those coming from very diverse comprehensive views can nonetheless reach a common ground on issues of background justice ruling the well-ordered society. Disagreements on religious, philosophical or moral matters will still remain but, what is important for the stability of society is that the political values are affirmed by individuals from within their own comprehensive doctrines. Rawls leaves citizens to "decide for themselves, how and in what way the political conception is related to their own comprehensive views".[467] To illustrate how citizens will be able to affirm the principles of justice from their own perspectives Rawls provided what he called a "model case".[468] This model case postulates that there are three main ways citizens come to accept and endorse the liberal conception of justice. First, citizens may affirm the political conception from their own religious doctrine and, in particular, from their commitment to a principle of toleration that leads them to "underwrite the fundamental liberties of a constitutional regime."[469] Second, their commitment to the political conception may be derived from a comprehensive liberal moral doctrine.[470] Citizens in this position find the political values fully agree with those proposed by their comprehensive doctrine. Third, citizens might endorse a pluralist view made up of a number of

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[466] Ibid. Page 141

[467] Ibid. Page 38

[468] Ibid. Page 145

[469] Ibid.

[470] Rawls mentions Mills and Kant as proponents of the kind of doctrine with political values that would be in perfect unison with those proposed by his political conception.

political and non-political values whereby the political conception is "affirmed by balancing judgments that support the great values of the political".[471]

Whichever approach is taken, citizens reach a moral consensus from within their own internal justification giving the agreement the necessary strength to support the stability of the well-ordered society.

I have shown how, Rawls hence refines the question of stability after realising that the requirement for congruence was too demanding, given the fact of reasonable pluralism, to secure stability in the face of reasonable pluralism. By restricting his conception of justice to the political sphere, Rawls hoped to reach an overlapping consensus of diverging conceptions of the good by ensuring the moral affirmation of the principles of justice from within each reasonable comprehensive view.

6.5 The natural capacities of empathy and their role in public reason and political justification.

The above discussion showed how Rawls believed that his political conception could generate an overlapping consensus among members of different and often irreconcilable comprehensive doctrines. Whether this overlapping consensus is achieved depends in part on whether the discourse on issues of justice is done in a way that reasonable citizens can accept. This section explores first Rawls's proposal of the use of public reason in the sphere of justice. Second, I show the role that the natural capacities of empathy and a sense of justice can have in the exercise of public reason.

A political consensus such as the one delivered by an overlapping consensus provides the content to public reason. Public reason is viewed by Rawls as the vehicle used to discuss and justify issues of political justice to citizens who generally hold views very different to our own. In order for the principles of justice to be acceptable and the focus of an overlapping consensus, they need to be publicly knowable and found to be acceptable to reasonable citizens. Although citizens may endorse the political conception of justice from their own non-public point of view, they have a duty to interpret and apply this political conception from a shared point

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[471] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 170

of view. The use of public reason involves providing public justification and due concern to what other citizens holding diverse comprehensive doctrines might be willing to consider reasonable.[472] The ideal of public reason is developed by Rawls to provide "standards of inquiry and reasoning that will allow people holding different comprehensive views to come to the same conclusion in applying the conception of justice."[473] Public reason will also serve to legitimise political power making it justifiable on grounds that are acceptable to citizens as reasonable and rational persons.[474] The principles of justice that citizens advocate are legitimate when free and equal people are able to endorse them in terms "acceptable to their common reason".[475] This requirement for legitimacy imposes a "duty of civility" that calls for citizens to explain to one another how questions of fundamental justice can be supported by public reason.[476] Furthermore this public justification must be done in a receptive and congenial manner:

> *" This duty also involves a willingness to listen to others and a fair-mindedness in deciding when accommodations to their view should reasonably be made"*[477]

The above passage shows how Rawls appeals to a set of political virtues needed in order to reach a consensus on issues of justice. These virtues are **reasonableness**, **fair mindedness** and a **reason to honour the duty of civility**.[478] Elsewhere[479] he adds to this list the virtues of **tolerance**, **being able to meet others halfway** and **a sense of fairness**. A cursory look at this list reveals the similarity[480] between each of these capacities. Rawls himself does not provide a detailed definition of each one

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[472] Ibid. Page xliv

[473] Freeman, S. R. (2006). "Justice and the Social Contract: Essays on Rawlsian Political Philosophy." Page 220

Rawls, J. (2005). *Political liberalism*: Columbia University Press.Page 217

[475] Ibid.Page 137

[476] Ibid. Page 217

[477] Ibid. Page 216

[478] Ibid. Page 139 and Page 224

[479] Rawls, J. (1987). "The idea of an overlapping consensus." *Oxford journal of legal studies*, 1-25. Page 17

[480] Susan Okin has remarked on how Rawls does seem to use the terms, reasonableness, a sense of fairness and a sense of justice interchangeably in his work. Okin, S. M. (1994). "Political liberalism, justice, and gender." *Ethics*, 105(1), 23-43.

of them or indeed explain how they relate or support one another. Notwithstanding this lack of clarity, it is clear that Rawls believed that these qualities were essential for political cooperation which includes the public justification of our political values. It is through their exercise, Rawls believes, that "reasoned public discussion of political questions"[481] takes place and consensus and unity is achieved between citizens. My view is that each of those virtues is necessary for the correct exercise of the duty of civility, therefore, and for the purpose of this discussion I understand the duty of civility to encompass the set of political virtues needed for political cooperation. Through the duty of civility, Rawls demands of citizens to conduct public reason using political values that fall within a range of liberal accounts of which justice as fairness is an exemplar.

Given the prominent role that the duty of civility has in political discussion, I next explore whether the natural capacities of empathy and a sense of fairness can affect its exercise.

The willingness to act upon a duty of civility and listen to the arguments that may be considered reasonable by citizens not sharing our conception of the good requires empathy. Engaging with the other party's reasons, consciously putting ourselves in the mind of another person with very different views, will help us engage with their reasons and perhaps elucidate the common shared reasons that can form the basis of political agreement. This does not mean that we come to accept the point of view emanating from specific comprehensive world views. A duty of civility requires that the reasons put forward on matters of justice are those drawn from the shared political culture. However empathy will help establish ties of cooperation with those very different from us and help elucidate those shared reasons.

This natural empathic attitude will contribute to the exercise of the duty of civility required in our dealings with others when discussing matters of justice. This may enable the individual to devote the required time and energy to see the shared political argumentation. This must not be interpreted as encouraging a situation where unreasonable arguments are accepted in the domain of public justification. Empathy may however contribute to find the common public reasons in situations

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[481] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 244

where originally we may have struggled to find some due to the very irreconcilable character of the comprehensive views. Empathy complements the duty of civility that it is owed to one another in the public discussion and justification of matters of justice.

The sense of fairness can also relate to the duty of civility. When engaging in political discussion our sense of fairness might compel us to use shared public values when others engage in that same manner for us. However strong we feel about the moral convictions and justifications coming from our comprehensive doctrines we might be more ready to appeal to shared values out of a sense of justice. When others are willing to set aside their own particular views and debate in terms reasonable people can accept, our sense of fairness will motivate us to do likewise. Seeing that others behave according to the duty of civility might appeal to our sense of fairness and be a driver to reciprocate when engaging in political discourse.

On these grounds, these capacities can reasonably be expected to influence the duty of civility owed to one another when engaging in public reason. Knowing the positive contribution that the capacities of empathy and a sense of fairness can make to public political deliberations will help us consider later in the thesis whether their enhancement via genetic means can contribute towards securing the stability of the well-ordered society. This will become particularly relevant once I evaluate the reasons why the stability conceived by Rawls may be more fragile than he originally envisaged.

6.6 When stability goes wrong:

Rawls insists that a political conception such as justice as fairness,[482] where citizens have a sufficiently developed sense of justice, can be the focus of an overlapping consensus and therefore stable. However, whether this stability is secured or not, I argue, seems to depend on two distinct yet related factors. First, the political conception, and therefore its principles of justice, may not engender the motivation

[482] In *Political Liberalism* Rawls uses justice as fairness as an exemplar of one of the possible candidates of liberal political conceptions of justice. There are other candidates that can be the focus of the overlapping conception and that share in common liberal values protecting a set of basic rights, liberties and opportunities; give priority to these over perfectionist values and allocate and adequate share of all-purpose goods to citizens to enable them to enjoy their freedoms Page 450

to give justice priority over any other competing demands originating from deeply held comprehensive views. This, I argue is a problem for Rawls originating from both reasonable and unreasonable doctrines. Second, the assumption that the sense of justice of citizens has been developed to the adequate level may not hold. This could be due to the failure of natural attitudes to generate appropriate feelings of fairness or because of inadequate social conditions that fail to nurture these natural attitudes.

Next, I explore how the Rawlsian stability might not succeed by first exploring each of these factors in succession. This discussion will be followed by proposing a biomedical solution to each of these challenges to stability, involving the genetic enhancements of moral dispositions. Finally I look at the potential Rawlsian objections to a biomedical answer to the problem of stability.

6.6.1 Failure to secure the Priority of Justice - the lack of assent from reasonable and unreasonable comprehensive doctrines

Citizens will regularly need to face not only the demands of justice but also the competing moral requirements arising from their comprehensive views. Rawls acknowledges that the stability of the well-ordered society will depend on the political conception's ability to generate the appropriate motivation in citizens:

> *"the sense of justice it (a conception of justice) tends to generate is stronger and more likely to override disruptive inclinations and if the institutions it allows foster weaker impulses and temptations to act unjustly"*[483]

The conflict arising between the priority given to justice and the priority given to the individual comprehensive doctrine is what Rawls calls the "strains of commitment".[484] According to Rawls, principles that impose strains of commitments in citizens will inevitably fail to generate the stability needed for the endurance of the well-ordered society. Nonetheless Rawls believed that demands from a liberal conception, such as justice as fairness, will gain priority over those coming from the reasonable comprehensive doctrines held by citizens. This allegiance is motivated

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[483] Rawls, J. (1971). *A theory of justice*: Belknap Press.

[484] Rawls, J. (2005). *Political liberalism*: Columbia University Press.

by the way the principles of justice secure equal basic rights and liberties as well as safeguard equality of opportunity publicly recognising its citizens as free and equal members of society. Furthermore Rawls believed that political society was good for the individual because it supported the social basis of self-respect.[485]

Rawls's reliance on the special status of the political domain over others belonging to each comprehensive doctrine is evident when he writes:

> *"the values of the political are very great values and hence not easily overridden: these values govern the basic framework of social life – the very groundwork of our existence – and specify the fundamental terms of political and social cooperation."*[486]

These values are enshrined within the principles of justice and the value of public reason that guides public inquiry in political discussion. The failure to see the priority of these political values over others we might hold within our own comprehensive doctrine is what Gerald Gaus has defined as "the problem of justificatory instability."[487] This happens "when people consider their full set of reasons they find the principles are not "fully justified."[488] This presents a problem to the stability desired by Rawls, since it needs to be shown that when justice conflicts with other values we cherish , the demands of justice win in order to secure a lasting stability.

The issue of justificatory stability is one that can apply to reasonable comprehensive doctrines, or more specifically, to the individuals subscribing to those doctrines.[489] Part of the difficulty in arguing that the priority of justice will prevail amongst reasonable people and doctrines stems from the "reasonableness" quality ascribed

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[485] Rawls, J. (1988). "The Priority of Right and Ideas of the Good." *Philosophy & Public Affairs*, 17(4), 251-276. Page 270

[486] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 139

[487] Gaus, G. (2011). "A Tale of Two Sets: Public Reason in Equilibrium." *Public Affairs Quarterly*, 25(4), 305-325. Page 307

[488] Ibid.

[489] Throughout his writings Rawls seems to be preoccupied with both how the doctrines generally and individuals in particular come to endorse the political conception. This has been referred as the population vs the individualized account of stability. I believe that Rawls's statements on stability remain the same regardless of the perspective taken. For a concise description of these two accounts see: Gaus, G. (2014). "The turn to a political liberalism." *A companion to Rawls*, 233-250.

to them by Rawls. The Rawlsian definition of reasonableness is very loose and diverse throughout his writings . At points he assumes that reasonable doctrines are those that act from the principles of justice; specifically, he asserts that the principles of justice themselves put limits on what can be conceived as a reasonable doctrine.[490] However, he also warns us against assessing the reasonableness of a doctrine by its content and therefore risk giving up the neutrality that a political conception needs to endorse. Rawls's answer to avoid the neutrality objection is to provide three defining features characteristic of reasonable doctrines:

First, the doctrine will be coherent, that is, "the major religious, philosophical, and moral aspects of human life must be integrated in a more or less consistent and coherent manner."[491] Second, it will provide direction and practical guidance by organising and characterising "recognized values so that they are compatible with one another and express an intelligible view of the world."[492] In relation to this second feature, the comprehensive doctrine must act as a filter, recognizing those values that are most relevant, and assessing their priority when they conflict with each other. Third, a reasonable comprehensive doctrine will tend to "evolve over time in the light of what, from its point of view, it sees as good and sufficient reasons."[493]

This very broad definition of reasonable comprehensive doctrines tell us little about the reasons why certain reasonable comprehensive doctrines might fail to endorse the political conception. Furthermore, it allows for what we would ordinarily consider "unreasonable doctrines" to be included within the reasonable category.[494] This, I believe, is the result of Rawls's desire to avoid any accusations of perfectionism and to keep his account of justice strictly political.

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[490] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 31

[491] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 59

[492] Ibid. Page 59

[493] Ibid.

[494] Think of radical xenophobic doctrines that believe that non-white people should not have the rights ordinarily awarded to citizens. These doctrines might still be considered to be coherent, provide practical guidance and their values be compatible with one another. Still few people would consider such a doctrine as reasonable in the way that Rawls presumably intended.

Rawls claims that "Political Liberalism counts many familiar and traditional doctrines – religious, philosophical and moral- as reasonable."[495] However, this assertion may seem counterintuitive given the way religious conflicts are resurfacing and the lack of common ground that is often present in attempts to resolve fundamental differences affecting people's basic rights and liberties. Furthermore, as Brian Barry points out, across the major religions we find wildly different ways to approach egalitarianism:

> *"mainstream Christian denominations have always tolerated socio-economic inequalities (including, in the past, slavery) vastly in excess of anything that could be justified by Rawls's "difference principle". Islam and Judaism embrace a similar spread of views, while Hindu and Confucian systems are inegalitarian to the core in a way that no monotheistic religion can be."*[496]

If Barry is correct, Rawls may have miscalculated the over-inclusiveness of his definition of reasonable doctrines and the threat this might pose to the stability of the political conception. The clash between the political values of liberal democratic societies and certain religious views can make the possibility of reaching an overlapping consensus highly difficult. The political values of the Rawlsian justice account need to win over those conflicting religious views that citizens regard as true. To illustrate the difficulty in securing the priority of political value, let us consider the example of the anti-abortionist Christian movement in America. Abortion is indeed a very emotive issue, nonetheless, Rawls believed that a politically reasonable resolution to the abortion debate could be reached through a balance of political values that were acceptable to reasonable persons.[497] However, terrorist acts associated with the anti-abortionist movement seem to suggest that such a balance may not always be possible. Since 1993, 11 people in the US are thought to have been killed in abortion clinics that are also regularly the object of fire and bomb attacks.[498]

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[495] Rawls, J. (2005). *Political liberalism*: Columbia University Press.

[496] Barry, B. (1995). "John Rawls and the search for stability." Page 911

[497] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 243

[498] Stack, L. (2015). "A Brief History of Deadly Attacks on Abortion Providers"*The New York Times*. City.

Now, the question that follows is how Rawls would respond to the objection that reasonable doctrines do not always lead to the stability required for the political conception. Rawls would claim that the occasionally unreasonable behaviour linked to a Christian movement does not deem the movement unreasonable. Rawls believes that a reasonable doctrine cannot be deemed as unreasonable just because sometimes it leads to unreasonable conclusions and behaviours. As long as a doctrine is reasonable most of the time this does not cause a problem for Rawls.[499] He might also add that the liberal conception does not demand full adherence by every single citizen to the principles of justice. For a democratic regime to endure, Rawls believes that "it must be willingly and freely supported by at least a substantial majority of its politically active citizens."[500]

However, even if a doctrine is only sometimes unreasonable it can be so with such a force that it has the potential to destabilise the democratic principles in an unacceptable manner. As Samuel Freeman[501] suggests when discussing the issue of abortion, this may lead their supporters to reject the principles of justice and public reason, not only in the issue of abortion but in other occasions causing a very real problem to the stability of society:

> *"Depending on how many citizens and how many reasonable comprehensive doctrines are in this position, it raises questions regarding the stability of the family of liberal conceptions."*[502]

Allowing the occasional unreasonable behaviours of reasonable doctrines may unwittingly lead to a de-stabilising force that a well-ordered society might be unable to stop. This brings the issue of when a reasonable doctrine shifts from occasionally displaying unreasonable behaviours to becoming an unreasonable one. Rawls does not tell us much about what that transition might look like. However, he does

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[499] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 244n

[500] Ibid. Page 38

[501] Freeman, S. R. (2006). "Justice and the Social Contract: Essays on Rawlsian Political Philosophy." Page 244

[502] Ibid. Page 64

explore how unequivocally unreasonable doctrines are a threat to the well-ordered society.

Unreasonable doctrines are believed to pose such a problem to stability that Rawls excludes them from the political process all together and they are liable to the legitimate use of coercion by the state. Rawls's concern about the threat of unreasonable doctrines makes him assert that liberal societies should contain them with the same force that they dedicate to fighting war and disease.[503]

Whereas his definition of reasonable doctrines, I have argued, was too wide, Rawls provides us with some clues throughout his texts on what he deems to be unreasonable conceptions. Comprehensive doctrines affirmed by people who refuse to engage in social cooperation and reject reasonable pluralism are considered to be unreasonable.[504]Additionally, unreasonable doctrines will try to impose the truth[505] of their comprehensive doctrines on others and use coercive power, if needed, to establish their authority.[506]

So, Rawls provides us with some guidance to help us identify unreasonable doctrines but he does not say much in terms of how we deal with them. This could be because, notwithstanding the threat of unreasonable doctrines, Rawls seems to consider that most comprehensive doctrines are indeed reasonable. The citizens of the well-ordered society, Rawls claims, will largely find a way to support the principles of justice within their own comprehensive view even if this means adjusting their own beliefs to accommodate the demands of justice. These revisions will "take place over time as the political conception shapes comprehensive views to cohere with it."[507] Having assessed the inconsistencies of the political values with their own doctrines via a process of reflective equilibrium, citizens will revise their own doctrines to accommodate the political conception. There is some hope that both occasionally unreasonable and unequivocally unreasonable doctrines will

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[503] Rawls, J. (2005). *Political liberalism*: Columbia University Press.

[504] Ibid. Pages 61-62

[505] Political liberalism deals with reasonable political ideas rather than ideas of truth coming from full comprehensive doctrines.

[506] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Pages 64-65

[507] Ibid. Page 160

eventually come to recognise the value of justice and affirm it within their own comprehensive views. As a result, Rawls believes that the well-ordered society will not give rise to unreasonable doctrines at such a rate that would be a substantial threat to stability.

However, Rawls wants for his political conception to be a "realistic utopia",[508] that is, the ideal of the well-ordered society is regarded as an achievable ideal. Underestimating the danger posed by unreasonable doctrines will not help his political conception to become a reality. Acknowledging that the prevalence of unreasonable doctrines might be higher than he originally anticipated will be the first step to develop the necessary tools to deal with them. Rawls does recognise this point and argues that, should these unreasonable doctrines prevail in society, the intended overlapping consensus will decrease and the liberal political conception will be jeopardised.

6.6.2 Inadequate moral development – The failure to develop an sufficient sense of justice.

Rawls has always assumed that those living in a well-ordered society will develop an appropriate sense of justice:

> *"given certain assumptions specifying a reasonable human psychology and the normal conditions of human life, those who grow up under just basic institutions acquire a sense of justice and a reasonable allegiance to those institutions sufficient to render them stable."*[509]

The above passages show that the moral development of individuals is therefore dependent on two main factors. First, the human nature of individuals needs to be such that the appropriate natural attitudes in the development of a sense of justice are present. Second, the appropriate social structures (family and civic education)

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[508] Rawls's political conception is realistic in so far as, he believes, it captures human nature but does not represent the exact social arrangements that might exist in real western democratic societies. Rawls, J. (2001a). *Justice as fairness: A restatement*: Harvard University Press, Rawls, J. (2001b). *The law of peoples: with, The idea of public reason revisited*: Harvard University Press. Page 4

[509] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 142

characteristic of a just society need to be such that allow these natural attitudes to develop into a functioning sense of justice.

I will deal with each of these issues in turn and propose that genetically modifying the individual's natural capacities might address any potential deficiencies in the development of a sense of justice.

First, looking at Rawls's account of moral psychology, it is evident that it hinges on normative facts about human nature that influenced the choice of his political conception:

> *"human nature and its natural psychology are permissive: they limit the viable conceptions of persons and ideals, and the moral psychologies that may support them."*[510]

Furthermore, Rawls writes:

> *"…an ideal presupposes a view of human nature and social theory ; and given the aims of a political conception of justice, we might say that it tries to specify the most reasonable conception of the person that the general facts about human nature and society seem to allow."*[511]

The restrictions imposed by human nature and how this affects his account of moral development will determine the different political conceptions that citizens would be able to adopt. In light of this, Rawls acknowledges that a conception of justice might need to be adjusted if the assumptions made prove to be wrong:

> *"It is for example, a consideration against a conception of justice that, in view of the laws of moral psychology, men would not acquire a desire to act upon it"*[512]

Limits imposed by our human nature can curtail our ability to develop an appropriate sense of justice.

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[510] Ibid. Page 87

[511] Ibid.

[512] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 138

Given the reliance of the choice of political conception on assumptions about the moral psychology of its citizens, it seems reasonable to question the validity of these assumptions. This is the view that George Klosko endorses when he writes:

> *"Assessing the possibility of his new society also requires examining the facts of moral psychology on which his claims rest."*[513]

Rawls takes it for granted that individuals have a natural capacity for love, mutual trust and friendship and that the feelings these attitudes evoke will give rise to just behaviours when engaging in social cooperation. However, do citizens have these capacities at an appropriate level and can they go beyond their immediate circle? Research suggests that innate helpfulness and friendliness does not extend beyond the immediate circle.[514] This may make it difficult to move beyond the second stage of moral development and extend the fellow feeling to those with whom we don't have any familial and affective ties. The same reasoning applies to the natural capacities of empathy and a sense of fairness, which I have discussed in this chapter. Even though it is possible, given the empirical evidence presented in this thesis, that we have inherent capacities for empathy and fairness, these two moral attitudes might not always extend beyond our familial and affective circles. An evening watching the news might teach us a lot about how far our empathy and reciprocal inclinations for one another might stretch. This is perhaps best exemplified by the amount of coverage received by domestic terrorist attacks compared to those happening outside our borders. Even though Rawls developed his account of justice limiting its applicability to closed domestic societies, this sentiment of detachment from the plight of others also applies to those who might not share our religion or socio-economic status. Empirical evidence shows that this feeling of detachment towards those who are not like us is present in toddlers from an early age.

These potential shortcomings in the reach of our natural attitudes can potentially be balanced with strong social structures that encourage the emergence of fellow feeling and adherence to precepts of justice. The problem arises when these

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[513] Klosko, G. (2015). "Rawls, Weithman, and the stability of liberal democracy." *Res Publica*, 21(3), 235-249. Page 241

[514] Argyle, M. (2013). *Cooperation (Psychology Revivals): The Basis of Sociability*: Routledge.

structures are not robust enough to deliver the moral sense of justice required for the stability of the well-ordered society.

So, how can the development of a sense of justice be compromised by an unsupportive social context, in particular by the family environment? Let us recall that blaming a faulty sense of justice solely on inadequate native talents would fall into the trap of genetic determinism. Although these native talents have been shown to be a necessary component of the moral development of individuals, they will only be developed under the right environmental conditions. Furthermore, there are times when that developmental process fails even when we are dealing with normal functioning individuals, with the required natural talents. The social context that the individual inhabits can also contribute to inadequate moral development.

Due to the paramount role that the family plays in the early development of the child, I focus on the family as the main institution involved in the development of a sense of justice in children. Most children up to the age of 4, spend the majority of their time with their parents. They are therefore the main influence in their lives until most of them enter the educational system. The growing trend of home education[515] means that this continued influence will continue well into adolescence making the input of the parents or carers in the development of the child even more pronounced. How the child evolves in the early years rests on the affection lavished by parents and the relationships of trust that children develop with their friends, fellow pupils and later on as citizens of a well-ordered society. The role that the family plays in the moral development of the individual is key.[516] [517] However, despite this prominent role, Rawls is not clear on whether the family should be considered an institution ruled by the public conception of justice. At points, Rawls insists that the institution of the family belongs to the private life of the individual where their own conception of the good applies and determines how the family functions. However, his writings also indicate that, unlike other associations

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[515] Although no official figures have been reported in the UK, freedom of information requests to 190 local authorities have shown a 65% increase in home-schooling from 2009 to 2015. http://www.bbc.co.uk/news/education-35133119

[516] Rawls, J. (1999b). "A theory of justice - Revised Edition." *Harvard Univ Pr*. Page 7 and Pages 458-504.

[517] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 258

belonging to the private sphere, the family would be required to be just in the Rawlsian society and be ruled by the principles of justice. This assertion is found in his later works when Rawls writes:

> *"The family is part of the basic structure, since one of its main roles is to be the basis of the orderly production and reproduction of society and its culture from one generation to the next".*[518]

Given the importance of the family in raising our future citizens, it would make sense for Rawls to ensure that it functions according to principles of justice that protect basic rights and liberties and opportunities. This could avoid unfair and dysfunctional behaviours in the family that might fail to instil the required moral dispositions in children.

The tension between the two perspectives on how the family fits within his political conception has prompted criticisms from writers such as Susan Moller Okin.[519] Given the hierarchical and gendered nature of the family, Okin doubts its suitability as a "school of justice"[520] for children in their development into autonomous citizens. Furthermore, the gender inequality in the family will lead to the unequal chances that Rawls was trying to avoid with his theory of justice. In her analysis, Okin questions the just character of the family:

> *"Rawls's neglect of justice within the family is clearly in tension with the requirements of his own theory of moral development. Family justice must be of central importance to social justice."*[521]

Whilst Rawls claims that the principles of justice do not directly apply to the running of the family, like Okin, he is also fearful of how the different versions of the family allowed under reasonable pluralism could endanger the equality of opportunity so valued in the political conception of justice as fairness. This leads him to question whether the institution of the family should be eliminated due to the likelihood of it

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[518] Rawls, J. (1997). "Idea of Public Reason Revisited, The." *U. Chi. L. Rev.*, 64, 765. Page 788

[519] Okin, S. M. (1989). *Justice, gender, and the family*: Basic books.

[520] Okin, S. M. (1994). "Political liberalism, justice, and gender." *Ethics*, 105(1), 23-43. Page 32

[521] Okin, S. M. (1989). *Justice, gender, and the family*: Basic books. Page 100

leading to unequal life chances amongst its members.[522] Because of the potential inability of some families to provide an affectionate and nurturing environment for the child, presumably the "moral development fails to take place to the extent that these conditions are absent."[523] Rawls's answer to this problem is that at the very least parents "should prepare them to be fully cooperative members of society and enable them to be self-supporting."[524]

The problem for Rawls is that delegating the moral development of the child to an institution that cannot be guaranteed to be just, risks not achieving the goals set within the moral development model. If the family does not instil the appropriate moral dispositions in children we risk failing to secure the priority of the justice. This is at odds with the role that the stages of moral development play in securing stability.

Perhaps aware of the shortcomings of the family in delivering the civic education required in the well-ordered society, educational institutions are established to deliver that function. Educating children in civic matters is a requirement of the well-ordered society. It is important that the requirements of civic education are restricted to those areas that secure good citizenship without making any non-political claims that permeate into other areas of the comprehensive doctrines of the citizens. In order for this civic education to remain within the political domain, Rawls claims its content should be restricted as follows:

> *"(it will) include such things as knowledge of their constitutional and civic rights so that, for example, they know that liberty of conscience exists in their society and that apostasy is not a legal crime, all this is to ensure that their continued membership when they come of age is not based simply on ignorance of their basic rights or fear of punishment for offenses that do not exist."*[525]

Children receiving this kind of education are expected to become fully cooperating members of society, aware of the basic rights and liberties enjoyed by all. This will

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[522] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 511

[523] Ibid. Page 466

[524] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 199

[525] Ibid. Page 199

enable them in the future to freely support and endorse their own comprehensive doctrine in the knowledge that they have the right and freedom to change their endorsement should they chose to. Part of this education will also include an understanding of the political virtues that will make citizens "want to honour the fair terms of cooperation in their relations with the rest of society." [526] The content of this education should be confined to the areas that promote the civic virtues that allow the child to become a fully cooperating member of the well-ordered society.

Ideally, parents should be the ones in charge of this education, however, in recognition of the limitations of the family in developing the role of their children as citizens, there should be other provision in place in the form of public education. The commitment to the provision of this kind of education implies, according to Okin "at least some compulsory public schooling for all."[527]Although Rawls does not explicitly state that civic education must be compulsory he considers it a requirement [528] of political liberalism.

The provision of a universal civic education could contribute towards correcting any moral development 'glitches' caused within the familial environment, however it might not be enough to counteract the damaging effect caused by the promotion of non-liberal values within the family.

6.6.3 Enhancing the moral development of individuals via genetic means

The previous sections highlighted how Rawlsian stability can be threatened by the non-compliance of reasonable and unreasonable doctrines and the inadequate development of a sense of justice. Next, I propose that these deficiencies in moral development could be addressed by biomedical means through the moral enhancement of future offspring. This proposal involves germline interventions designed to enhance the capacities for empathy and a sense of fairness. I also explore the potential contribution that the cognitive capacities already explored in this thesis can make to Rawlsian moral development.

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[526] Ibid.

[527] Okin, S. M. (1994). "Political liberalism, justice, and gender." *Ethics*, 105(1), 23-43. Page 32

[528] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 199

Focusing first on the non-compliance of comprehensive doctrines, the enhancement of the natural capacities for empathy and a sense of fairness could contribute towards stability in two distinct ways. First, an enhanced capacity for empathy might decrease the instances where citizens force their views on others holding different comprehensive world views. Going back to the case of the Christian antiabortion group, the members of this radical movement might have found it easier to identify themselves with the plight of the health professionals and pregnant women, visualising their feelings and more generally "putting themselves in their shoes". This enhanced empathic concern might have restrained any inclinations they had to impose their "truth" on citizens that did not share their comprehensive view. Second, the enhancement of both empathy and the sense of fairness may have strengthened their moral duty of civility and motivated them to make use of shared political values when publicly proposing or debating issues related to fundamental justice such as procreative liberty and the foetus's right to life. This way a resolution to the abortion dispute may have been reached in the way Rawls originally envisaged.

Second, let us consider the situation where the human nature of the individual is not as envisaged by Rawls. In this case, the innate reciprocal behaviours and capacities for fellow feeling might either not be present or be present at an insufficient level to secure the development of a sense of justice or other political virtues such as the duty of civility. In this case, we would have the option to modify the human nature of future citizens to fit the requirements of the political conception. This would clearly be a controversial move, however let us assume for a moment that Rawls's demand for the stability of the political conception was strong enough to justify such a move. Enhancing the natural capacities of future persons would ensure adequate moral development provided the suitable social structures to foster and develop those natural dispositions were in place.

Third, the use of germline enhancements might help us minimise the damage that the family might cause to the development of the child's sense of justice. Strengthening the natural moral disposition towards reciprocal behaviours could counteract the potential negative impact that the family environment might cause. Equipping children with better than normal enhanced natural attitudes might

enable them to develop them with fewer environmental inputs or with environments that do not nurture liberal political values. When exposed to environments that fail to nurture the value of the precepts of the political conception, the negative effects on the moral development of children might be less pronounced if their natural dispositions towards just behaviours have been enhanced. In summary, enhancing the natural attitudes of the child might result in a sense of justice that is developed to the appropriate level and secures the support of the political conception despite defective social structures that fail to promote liberal political values.

Finally, let us consider how a joint genetic intervention, enhancing both cognitive capacities and the capacities for empathy and for a sense of fairness, may affect stability. Together with a family and educational system delivering an effective programme of civic education, genetic interventions could increase the chances of successfully "producing" citizens who endorse and affirm liberal political values consistently. At this point the introduction of genetic cognitive capacities, alongside those enhancing empathy and a sense of fairness could be justified on the following grounds. First, chapter two discussed how the prospect of genetic moral enhancements will need to be accompanied by cognitive capacities that help us elucidate when and how to be moral. A higher capacity for empathy, for example, might not always generate the just results needed for stability. Citizens with an enhanced capacity for empathy might find themselves more permissive of doctrines that fail to respect liberal political values. This might lead to a higher number of instances where individuals successfully and forcefully impose their private beliefs in others that could not reasonably share them. Introducing the enhancement of cognitive capacities alongside these enhanced moral capacities would help us to identify which behaviours deserve our empathy and which ones should be rejected on the grounds of justice. Furthermore, increased cognition may increase our deliberative and reasoning skills and help us to better understand each other's

reasons and points of view[529] leading to a more harmonious society.[530] Accompanied by the relevant cognitive capacities, moral genetic enhancements may provide citizens with the tools to engage in political deliberation under the duty of civility. Second, going back to Rawls's original discussion on unreasonable doctrines, let us recall how Rawls believed that living under just institutions would eventually lead citizens to find a way to accommodate the demands of justice. This was done via a process of reflective equilibrium which would lead them to revise their own doctrines to accommodate the demands of justice. Arguably, genetic interventions designed to increase the capacities associated with fluid intelligence might help with this process.

It is important when thinking about the potential effects of these genetic interventions to keep reminding ourselves not to fall into the trap of genetic determinism. None of these enhancements will have any value unless they are accompanied by the right environment to help them develop into actual moral dispositions. If the appropriate social structures are not in place these improved dispositions are unlikely to be developed. Therefore, whether we are dealing with unreasonable comprehensive doctrines or with unsuitable family structures, additional societal measures need to be in place to secure the realisation of these enhanced capacities. These genetic interventions need to be supported by appropriate institutions offering the civic education that enables individuals to become fully functioning citizens.

[529] This argument relates to the discussion in Chapter 4 about how improved cognitive capacities might influence the effect the burdens of judgement have on the exercise of the citizens' two moral powers

[530] Elsewhere in the thesis (Chapter 2) I have explored how the enhancement of some cognitive capacities alongside certain emotional dispositions might lead to an overall improvement of moral reasoning. This might lead to more congenial relationships between citizens living in a given society and when dealing with others holding distinct comprehensive doctrines.

6.7 Alternatives approaches to the challenge of Rawlsian stability

Having shown how genetic enhancements may reduce the instances when stability might be at risk, it is necessary to look closely at the Rawlsian political conception and identify any objections that might prevent us from supporting their implementation. First, I will begin by considering how the enforcement of these interventions may go against the Rawlsian ethos and jeopardise the protection of basic rights and liberties. Second, I will consider two other options open to Rawls in order to address the challenge of stability. One option is whether changes to his political conception need to be made in order to accommodate a less optimistic view of human nature. The other option is that he might concede that even though the chosen principles of justice are justifiable given the shared fundamental intuitions, settling for a modus vivendi might make the implementation of his political conception more realistic.

6.7.1 Against the enhancement of moral capacities – A Rawlsian response

Notwithstanding the appeal of enhancing human capacities to secure the stability of the well-ordered society I argue that there are some features of the Rawlsian political conception that would make the enforcement of these interventions incompatible with its liberal precepts.

To illustrate how the principles of the liberal conception might be compromised, I begin by contrasting the implementation of these interventions with the provision of civic education. A society governed by the liberal principles of justice requires some sort of compulsory civic education. The aim of this type of education is to promote the political virtues and civic duties needed for a liberal ideal of citizenship. Its compulsory nature contributes to a sustained well-ordered society across generations through the social reproduction of just citizens, eventually leading to the elimination of comprehensive world views that fail to adhere to liberal precepts. Another implication of an established compulsory system of civic education is that parental rights to the control of the education of their children are no longer absolute. The requirement for civic citizenship overwrites the parental desire for their children not to be exposed to liberal values. This limitation to parental freedom however, only applies to the political sphere; with regards to issues unrelated to political justice, parents will be free to educate their children according to their own

comprehensive world view. Now, arguably, the assisted moral improvement of citizens via genetic interventions would seem to fulfil, or at least help fulfil, similar aims to those required from civic education alone. However, there seems to be something importantly different between both approaches to achieving stability. Can the limitations to the reproductive right of parents, through the imposition of genetic interventions, compare to the limits set for their parental education rights? I argue that the type of rights that would be violated through compulsory genetic interventions are more fundamental than those pertaining to freedom of education. As it was the case when I considered compulsory cognitive enhancements, any attempts to impose these genetic modifications will breach the basic rights protecting the integrity of the person under the first principle of justice.[531] Furthermore, this would constitute for Rawls an unacceptable invasion of the private life of citizens that he was determined to keep separate from the public duties of justice.

Nevertheless, citizens of the well-ordered society may freely choose to genetically intervene in the moral dispositions of their offspring without the need of any compulsory social policy. These interventions have the potential to be freely chosen by citizens, either for reasons of justice or for reasons stemming from their own comprehensive view. Some citizens may decide that these interventions are generally valuable. This could be the case for those that are considered unreasonable under a liberal conception of justice. Let us consider the case of the religious fundamentalist doctrine that, according to Rawls, would struggle to thrive under a society governed by the principles of justice. This type of comprehensive doctrine may consider it useful for their adherents to display higher levels of empathy and fairness to help consolidate the social cooperation within their group. This, they might argue, will enable them to secure their existence across generations. An unexpected result, however, could be that those improved empathic and fairness tendencies are not just limited to their very own comprehensive world view. Once our moral capacities are enhanced it will be hard to restrict how far they will reach. These dispositions might extend to the reasonable doctrines inhabiting

[531] Rawls, J. (2005). *Political liberalism*: Columbia University Press. Page 291

the liberal society leading to an increased willingness to listen, be more perceptive to other views and share in the liberal political values characteristic of the well-ordered society. Indirectly, the effort to reinforce the permanency and supremacy of unreasonable doctrines may lead to them publicly sharing in and engaging with the public values of social cooperation.

I have briefly explained how genetic interventions contributing to the moral development of stability cannot be part of a compulsory model of civic education without risking harming the basic rights and liberties that the liberal conception of justice aims to protect. Nonetheless the voluntary endorsement of these interventions by citizens may contribute to the long lasting stability of the well-ordered society. This endorsement might be extended to unreasonable doctrines with their citizens becoming motivated to publically affirm the liberal conception of justice.

The non-compulsory character of these technologies means that Rawls cannot rely on them to secure a long lasting stability. Should the prospect of stability not prove achievable, I argue that Rawls can modify his theory in one of two ways. One option is to re-design the principles of justice so that they are compatible with natural and social conditions. The other option is to relax his requirement for achieving stability for the right reasons.

6.7.2 Amend or re-design the principles of justice

Stability first becomes a consideration at the point when the political conception is being developed. When assessed against other accounts of justice, mainly utilitarianism, Rawls concludes that a conception such as justice as fairness is likely to gain a larger number of supporters. Utilitarianism proves to be too demanding as a political conception because it requires that citizens make sacrifices for the sake of others' wellbeing, which is not consistent with the principles of moral psychology.[532] However, I have already argued that the assumption that Rawls makes about the moral psychology of individuals may not be correct. The possibility that reciprocal behaviours may not be present at the level that Rawls anticipated might mean that

[532] Rawls, J. (1971). *A theory of justice*: Belknap Press. Pages 176-178

his liberal political conception does not become the focus of an overlapping consensus.,

Rawls leaves open the possibility that, should stability not be achieved, we might need to consider either amending the principles of justice to make the conception more stable or the possibility that a democratic conception cannot always achieve stability:

> *" We should have to see whether acceptable changes in the principles of justice would achieve stability or indeed whether stability could obtain for any democratic conception"*[533]

Rawls does not specify what changes would be considered acceptable nor does he pursue the possibility of changing the principles of justice further. Furthermore, he never expands on the idea of stability not becoming a realistic possibility. This is an outcome that Rawls does not consider further, the case for stability on a liberal conception such as, or similar to, justice as fairness has been argued and should obtain. Nonetheless, the above passage suggests that he would be open to consider either of these options should his assumptions for the development of the political conception prove to be wrong. Should this be the case, Rawls is left with the difficult task of amending the principles or potentially abandoning the liberal precepts that are the focus of his theory of justice. This could potentially lead him to abandoning the protection given to basic rights, liberties and access to opportunities and compromising on the distribution of all-purpose goods. Rawls might find that his principles become less liberal or that stability, if it is to be achieved, cannot do so without breaching the democratic ethos.

If an enduring society is what really matters then normative considerations regarding the content of the principles themselves might need to reconsidered so that stability is achieved.

There is however another option that Rawls might need to consider: relaxing the requirement of stability for the right reasons.

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[533] Rawls, J. (2005). *Political liberalism*: Columbia University Press.Page 66

6.7.3 Relaxing the requirement for stability.

Should stability play such a central a role in the Rawlsian political conception? Authors such as James D Wright believe that concerns over the stability of modern democratic regimes are overstated.[534] Smooth transitions of power, the coexistence of a plurality of views and freedom of speech, amongst other factors, renders democratic regimes more stable than their authoritarian counterparts. Political history since World War II shows how most industrial democracies have remained stable, this leads Wright to claim the following:

> *"In the modern world, democracies prove not to be inherently unstable, as much theory suggests, but rather obdurately stable under almost all circumstances"*[535]

Rawls may respond that a period of stability lasting less than 70 years is not a sign of stability, at least not the kind of stability he wished to achieve. Nonetheless, Rawls himself seems to be conflicted about the value that should be given to issues of stability. Whereas answering the problem of stability becomes one of his main concerns in *Political Liberalism,* he seems to downplay its importance in *A Theory of Justice.* Throughout *A Theory of Justice* Rawls maintained that stability alongside justice and efficiency was one of the virtues that should be present in social systems. Nonetheless, he provides an important qualification to this statement asserting that justice should always take priority.[536]

This implies, that if we are comparing two political conceptions one of which is more stable but more unjust than the other, this would not be enough reason for adopting it. Stability will sway the decision only if we are comparing two schemes which are equally just. The emphasis given to stability might commit Rawls to choosing conceptions of justice where, for example, not enough protection is given to basic rights and liberties. This would be unacceptable if Rawls is to remain true to his early writings when considerations of justice prevail and once again becomes the "most important virtue of institutions."[537]

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[534] Wright, J. D. (1981). "Political disaffection", *The handbook of political behavior*. Springer, pp. 1-79.

[535] Ibid.

[536] Rawls, J. (1971). *A theory of justice*: Belknap Press. Page 6

[537] Ibid. Page 6

If, as Rawls seems to believe, justice should be the main consideration in the design of basic institutions then he might decide to settle for a less demanding account of stability. A "modus vivendi" might be the less demanding form of agreement on social cooperation whilst preserving the justice of basic institutions.

I have shown that the case for the compulsory use of genetic enhancements for the moral development of citizens would fall foul of the precepts of liberal justice. However, the free, un-coerced use of these interventions will still make a positive contribution towards securing the stability of the well-ordered society. In addition to this I have proposed that, if the problem of stability remains a problem for Rawls, there are two non-genetic options open for consideration. One option involves reconsidering the content of the principles of justice so that they are consistent with a different account of human nature. The other option is to relax the demand for stability so that justice once again becomes the primary concern in the choice of principles of justice

6.8 Conclusion

Rawls's concern with stability is reflected in his comprehensive attempts to justify that his political conception could engender the right motivation in the citizens of the well-ordered society.

I argued that the capacities for empathy and a sense of fairness play a key role in the development of this motivation. In my attempt to show that the enhancement of the natural capacities for empathy and a sense of fairness could contribute towards solving Rawls's problem of stability, I begun by showing how they can become part of his moral development account. I showed that both natural attitudes evoke the emotion of guilt when failing to act morally. This emotional response is the same elicited by the natural attitudes of love, friendship and mutual trust that Rawls considers essential for the development of a sense of justice. I concluded that empirical evidence of the innate nature of empathy and a sense of fairness together with the guilt evoking quality they share with love, mutual trust and friendship qualify them to be part of the Rawlsian account of moral development.

The discussion then moved to a brief outline of the congruence argument and the overlapping consensus illustrating the evolution of Rawls's thinking on stability. His

final account of stability describes how the liberal political conception can be stable by becoming the focus of an overlapping consensus of reasonable comprehensive doctrines. Explaining Rawls's account served as a platform to speculate on how the stability of the well-ordered society might be threatened by two distinct factors. First, the failure to secure the priority of the right; and second, the inadequate moral development of citizens.

I proposed that the moral enhancement of individuals might contribute to the stability of the well-ordered society. First, instances of unreasonable behaviours might decrease as empathetic concern for the views of others restrains the inclination of unreasonable citizens from imposing their truth. Furthermore, enhanced capacities for empathy will strengthen their moral duty of civility and increase the use of public reason in political discourse. Second, moral enhancement will contribute to the adequate moral development of citizens in instances where they lack the natural attitudes or where the social institutions that help develop these capacities are defective. I finished this section by re-introducing the possibility of genetically enhancing cognition and suggesting that, in order to morally enhance citizens, it might also be necessary to enhance their cognition. This will help them to better identify unreasonable doctrines; regulate their tendencies towards empathy and fairness and engage in a process of reflective equilibrium that might lead to a revision of their own doctrines to accommodate the demands of justice.

Finally, I argued that despite the positive contribution that moral enhancement can make towards securing the stability of the just society, this kind of genetic intervention could never be compulsory. These interventions would be permissible under the Rawlsian political conception, however the protection given to fundamental rights and liberties would forbid any enforced genetic modification. Nonetheless, citizens may opt to voluntarily enhance their children either for reasons grounded on justice or for reasons coming from their own comprehensive doctrines. Should the stability of the well-ordered society still be at risk, Rawls is left with two additional alternatives. One option would be to re-design the principles of justice to render a more stable society. Another option would be to relax the requirement for stability for the right reasons.

Chapter 7. Conclusion

When I began this project seven years ago, I did not have a clear notion where the arguments I was developing were going to lead. As I became immersed in Rawls's immense philosophical body of work, I started to get the very slight inkling that I might be able to contribute to his theory, even in the smallest of ways. Throughout the thesis I have explored Rawls's political conception drawing largely from the early edition of *A Theory of Justice*, *Justice as Fairness, a Re-statement* and the latest formulation of *Political Liberalism*. *Political Liberalism* provided the basis for exploring the arguments for securing the stability of the society organised by the principles of justice, whilst the majority of my discussion of primary goods and moral psychology relates to the first edition of *A Theory of Justice*. I have also explored the many papers that lead to the development of Rawls's books that, in his own admission, he often saw as "opportunities to experiment with ideas which would later be revised or rejected in a book."[538] These papers, mostly derived from lectures delivered over the years provided an invaluable insight into how his ideas developed and helped formulate his final account of justice.

My wish was to find a way whereby the introduction of both genetic cognitive and moral enhancements into Rawls's political theory could potentially strengthen his liberal account of justice. I hope that my arguments during this thesis convinced the reader that this was indeed the case. I will now summarise how I believe my research has made a positive contribution to developing Rawls's theory of justice. Due to the inevitably limited scope of this dissertation, I will also briefly mention some other areas of unresolved issues and areas deserving of potential future research.

[538] Freeman, S. R. (2006). "Justice and the Social Contract: Essays on Rawlsian Political Philosophy."Appendix B, Page 327

7.1 Contribution to the Rawlsian theory of justice

Genetic cognitive enhancements can contribute to the Rawlsian political conception in two distinct ways. First, I have proposed that the index of primary goods be modified to accommodate the incorporation of those genetic cognitive technologies designed to augment the capacities constitutive of fluid intelligence.

Having assessed the role that genetic cognitive enhancements have as all-purpose means for the pursuit of a wide variety of ends, I argue that they are suitable candidates for their inclusion in the index. These new technologies, serve the Rawlsian theory in making interpersonal comparisons, identifying the least advantaged representative group and, ultimately, in being part of the process to assess permissible inequalities in socio-economic shares.

Second, after demonstrating the permissibility of these technologies under a society governed by the Rawlsian principles of justice, I argued that voluntary uptake of these technologies by citizens can have a positive role in delivering the goals of the Rawlsian theory. This claim is substantiated by the way enhanced capacities, alongside education, can broaden the range of opportunities open to citizens, as well as increasing the social product available for distribution under the dictums of the difference principle.

Besides the above contribution to the Rawlsian theory of justice, an important strength of my account, I believe, is my adherence to the Rawlsian framework. Throughout the evaluation of genetic cognitive enhancements I have remained faithful to the conditions set by Rawls in the development of his theory of justice. This differentiates my approach from other contemporary attempts to extend Rawlsian theory. These differences are highlighted when contrasting my theory to Daniels's extended FEO principle and Farrelly's lax biological difference principle. First, whereas discussions about genetic enhancements, in both approaches, are limited to their role in restoring normal functioning, I assume throughout that these technologies will take the individual beyond this level. Although dropping the normality assumption restrains the potential role these enhancements can have in the Rawlsian theory, my approach is more daring in dealing with, I believe, the more ethically problematic prospect of making citizens "better than well". Second, unlike Daniels's account, my approach does not require significant modification of the basic

institutions in order to accommodate these new technologies. The Rawlsian FEO only needs to be extended to secure the removal of barriers that would prevent or limit access to genetic cognitive enhancements. Third, unlike Farrelly's approach, the method used to identify the least advantaged representative group remains unchanged, therefore minimising issues of measurability and complexity. This is achieved by the continued use of wealth and income as a suitable proxy for the identification of the least advantaged group. Measuring the least advantaged in terms of natural primary goods, as Farrelly proposes, risks falling into value judgements about the moral worth of individuals based on their natural endowments and compromises the real-life workability of the theory.

The discussion around moral cognitive enhancements revolves around the capacities for empathy and a sense of fairness and their contribution towards the stability of the Rawlsian society. I argue that these moral dispositions should become part of the Rawlsian account of moral development. Furthermore, I show how both empathy and a sense of fairness can help the stability of the well-ordered society through the reduction of unreasonable behaviours, strengthening the moral duty of civility and helping towards the development of a sense of justice when either citizens lack the appropriate natural attitudes, or the social institutions to help develop these capacities fail.

As a consequence of the respect and protection given to the procreative liberty of citizens, the implementation of these germline technologies cannot be enforced. Nonetheless, the arguments presented in this thesis grant their moral permissibility within the scope of the Rawlsian well-ordered society.

7.2 Limitations: what was left untold

This dissertation has hopefully convinced the reader of the moral permissibility, from within the perspective of the Rawlsian justice account, of germline cognitive and moral enhancements.

It is clear however that this is only part of a much bigger picture. Although, a snapshot of other relevant ethical concerns was given in Chapter 3, a much more thorough discussion needs to take place before embracing these technologies. Importantly the responses to these ethical concerns have been left untold. Let us

consider for example the issue regarding the existence of future persons. Challengers to the arguments from dignity, authenticity and autonomy and sympathetic towards Derek Parfit's "Non-identity Problem", [539] may reject these types of objections outright. Our obligation to future generations, in their eyes, may therefore be a lot less restrictive than these ethical concerns may convey. This is the view that transhumanist thinkers, such as Anders Sandberg[540] and Nick Bostrom[541] endorse. If these technologies are safe, parents, they believe, should have the freedom to enhance their offspring if that results in a happy, healthy and talented child. Although I have merely highlighted the most frequently discussed issues in the literature, a more thorough analysis is needed, with each of the concerns being satisfactorily addressed for a full defence of germline cognitive and moral enhancements.

Another important question that remains yet unanswered is the feasibility of these genetic interventions. I have briefly addressed, in Chapter 2, the practical limitations of genetic interventions. However, the difficulties associated with the potential alteration of both cognition and morality cannot be understated. Intelligence is renowned for its multifactorial character.[542] Although there is evidence supporting the heritability of intelligence and cognitive capacities, the number of genes involved in their development and how they interact with each other is still largely unknown. We encounter similar problems when dealing with moral cognitive enhancements. The multifactorial character of morality and how genetic manipulation could affect other emotional capacities needs further investigation. This challenge is further compounded by the current debates on what morality really means. In order to assist with the feasibility of my enquiry, I recognise that I have been required to simplify these very complex issues. Based on current evidence, I have chosen those cognitive and moral capacities more likely to have a biological component and most amenable to manipulation. More research, both empirical and philosophical is

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[539] Parfit, D. (1984). *Reasons and persons*: OUP Oxford. Part IV

[540] Bostrom, N., and Sandberg, A. (2009). "Human enhancement." *Human Enhancement*, 375.

[541] Bostrom, N. (2005a). "A history of transhumanist thought.", Bostrom, N. (2005b). "In defense of posthuman dignity." *Bioethics*, 19(3), 202-14.

[542] Burt, C., and Howard, M. (1956). "The multifactorial theory of inheritance and its application to intelligence." *British Journal of Mathematical and Statistical Psychology*, 9(2), 95-131.

needed before we assert that an individual can be morally enhanced via biomedical means.

Notwithstanding these limitations, there is, I believe, huge value in this ethical enquiry. Discussions about distributive justice are most pertinent before any justice related concerns become a reality.

7.3 Taking the research forward

This dissertation has only made a small but hopefully valuable contribution to the distributive justice debate arising from the introduction of genetic cognitive and moral enhancements.

The scope for further research is vast, however I would like to suggest two potential areas that could be explored.

First, the indexation problem intrinsic to the measurement of primary goods is yet to be resolved. I am aware that the expansion of the index to allow the incorporation of genetic cognitive enhancements, will only add to this challenging problem. However, I have tentatively suggested a potential solution that requires further consideration. In deciding the weight of these technologies against other primary goods, an assessment of achieved milestones that can be, in part, linked to having received the cognitive enhancement could be a plausible option.

Second, this piece of work has been restricted to closed domestic societies without considering the effects these technologies could have at a global level. In particular, I suggest the evaluation of how the introduction of these technologies could affect social cooperation between a Society of Peoples as described by Rawls in *The Law of Peoples*.[543] Differences in access to these technologies could mean that reasonable interests, and therefore the demands made by different peoples, vary between nations. This could warrant assessment of whether these new technologies may destabilise a just and stable political order between democracies and nondemocratic, but decent, societies.

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[543] Rawls, J. (2001b). *The law of peoples: with, The idea of public reason revisited*: Harvard University Press.

The novel character of these technologies makes the range of possible research both wide and exciting. I hope that my own work may serve as a starting point for future philosophical deliberation.

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