Ethics and the epigenetic challenge - a bioethical study across the human lifespan

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Abstract

This PhD thesis is about epigenetics and its implications for ethics throughout the human lifespan. It contains 10 single-authored academic articles. At the time of the writing, 8 of them have been published in peer-reviewed journals in philosophy and bioethics.

I start by examining what moral responsibilities we have towards people who do not yet exist (and who might never come into existence). Recent developments in epigenetics indicate that the lifestyle choices we make in the present affect the health and well-being of our future offspring. I make the argument that we are partly morally responsible for the health and wellbeing of our future offspring. I consider whether the argument, which I call the epigenetic responsibility thesis can be overcome. When considering counter-arguments, I examine the moral status of embryos and fetuses, criticize a new pro-life position and advance a particular pro-choice position. I also present a puzzle for those who generally accept abortions, but who have trouble with accepting fetal reduction (aborting of one the twin fetuses).

In a series of papers, I focus on human age and ageing. I argue that in some cases people should be allowed to change how old they officially are since there are many plausible approaches to the concepts of age and ageing – one being biological age that can be estimated through our epigenetic clocks. I defend the idea of legal age change against the counter-arguments from my critics.

The methodological approach used throughout the thesis involves frequent thought experiments and analogies. I will critically examine and advance the arguments presented by others and start new conversations. The methodological choices are explained in the introductory section. The scientific background, as well as the key concepts, will also be comprehensively explored. The thesis advances the field of philosophical bioethics by producing new original research on the ethics of epigenetics throughout the human lifespan.

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Contents

List of original publications

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II. Räsänen, J. (2020). Against the impairment argument: a reply to Hendricks. ***Bioethics***, 34(8), 862–864.

III. Räsänen, J. Defending the de-dicto approach to the non-identity problem. Unpublished manuscript.

IV. Räsänen, J. (2021). Liberal utilitarianism – yes, but for whom? ***Cambridge Quarterly of Healthcare Ethics***, 30(2), 368–375.

V. Räsänen, J. (forthcoming). Twin pregnancy, fetal reduction and the 'all or nothing problem'. ***Journal of Medical Ethics***, DOI:10.1136/medethics-2020-106938.

VI. Räsänen, J. (2020). Schrödinger's fetus. ***Medicine, Health Care & Philosophy***, 23(1), 125–130.

VII. Räsänen, J. (2021). Age and aging: what do they mean? ***Ratio***, 34(1), 33–43.

VIII. Räsänen, J. (2019). Moral case for legal age change. ***Journal of Medical Ethics***, 45(7), 461–464.

IX. Räsänen, J. (2019). Further defence of legal age change: a reply to the critics. ***Journal of Medical Ethics***, 45(7), 471–472.

X. Räsänen, J. (2020). Age change in healthcare settings: a reply to Lippert-Rasmussen and Petersen. ***Journal of Medical Ethics*** 46(9), 636–637.

Research questions and the epigenetic challenge

My aim in this work is to answer the following research question:

> *How should we understand the moral implications of new understandings of epigenetics throughout the human lifespan?*

This broad aim of the thesis covers, what I call, the *epigenetic challenge*: understanding the moral implications that epigenetics raise throughout the human lifespan.

The epigenetic challenge will be dealt with by examining the more detailed research questions that are framed as follows.

> (1) Based on recent scientific findings, e.g. in epigenetics, do we have moral responsibilities towards those people who do not yet exist or who will never exist?
>
> (2) Are embryos or fetuses the sort of beings whose life it is morally wrong to end and if they are (not) how does this relate to our moral responsibilities towards future people?
>
> (3) How should we understand the concepts of human age and ageing when it might be possible to estimate one's biological age accurately by epigenetics and what implications do the different understandings of age and ageing have for justice and morality?

To address these questions, I will use philosophical argumentation. In this introductory section, I offer an overview of relevant background theories and scientific results, explained at a sufficient level of detail to understand and examine the research questions. These will include the science behind epigenetics and the ethical views related to them, the science behind biological ageing, the problem of non-identity, the problem of non-existent people, and ethical positions on the moral status of embryos and fetuses. The details of the argumentation methods will be explained in the Methods of Argumentation section. Rather than relying on a rigid structure, I will introduce the papers, their arguments and their links to background theories and methods when it feels natural to do so. At the end of the introductory section, I will articulate the links between the papers distinctly. In the thesis, I will advance the field of philosophical bioethics by producing new original research on the ethics of epigenetics throughout the human lifespan.

As the following chapters will show, I have arrived at the following answers to the research questions, presented here in the most abbreviated form possible:

> (1) Yes, we probably do have some moral responsibilities towards people who do not yet exist and who might never exist.

(2) No, embryos and fetuses probably do not have significant moral status, however, if they do (and maybe even if they do not) there are interesting philosophical puzzles to be solved.
(3) There are different understandings of human age and ageing and some of them have intriguing practical implications for justice and morality: people should be allowed to change their legal age.

Epigenetics

I will here explain the concept of epigenetics and how it relates to my work. First, I offer a brief overview of the science of epigenetics at the depth necessary to understand the philosophical arguments, before moving on to cover the most important previous literature on the ethical issues related to epigenetics. Lastly, I will explain how epigenetics relates to age and ageing.

Science of epigenetics

Epigenetics is the study of heritable changes in cellular and physiological traits that are not caused by changes in the DNA itself. Our DNA does not solely define our phenotype—our observable characteristics. It is more like a template that could be molded by external factors. Epigenetics describes the long-term alterations in the transcriptional potential of a cell.

In her book *The Epigenetic Revolution*, Nessa Carey explains the idea of epigenetics as follows:

> [DNA is] like a script. Think of Romeo and Juliet, for example. In 1936 George Cukor directed Leslie Howard and Norma Shearer in a film version. Sixty years later Baz Luhrmann directed Leonardo DiCaprio and Claire Danes in another movie version of this play. Both productions used Shakespeare's script, yet the two movies are entirely different. Identical starting points, different outcomes. (Carey 2011: 2).

While this analogy is not perfect, as we will see later when considering arguments from analogy, it does serve its purpose. If our phenotype (our observable traits) were a movie, then genetics would be the script, and epigenetics would be all the other factors affecting the final outcome—actors, directors, sets, soundtrack, and so on. A movie based on the script of *Romeo and Juliet* could not produce *Star Wars: The Force Awakens*, but any given set of different actors, directors, and so on would inevitably produce a movie that is quite different from one with a different cast and crew.

Likewise, though the DNA of a human could never result in the body of an octopus, different expressions of the same DNA sequence can nevertheless yield very different outcomes.[1]

Currently, there are at least three ways epigenetic changes are considered to initiate and sustain. These are DNA methylation, histone modification, and non-coding RNA. All of them change the way in which any given gene is expressed, or indeed whether it is expressed at all.

DNA methylation is a mechanism that occurs by the addition of a methyl (CH_3) group to DNA, thereby modifying the function of the genes and affecting gene expression (Kim & Costello 2017). Cytosine is the only one of the four DNA bases (adenine, cytosine, guanine, and thymine) that gets methylated. Equally important is the reverse mechanism of DNA *de*methylation, which involves the removal of a methyl group from cytosine bases in DNA. The demethylation can be passive or active. The passive process takes place in the absence of demethylation of newly synthesized DNA strands by a particular enzyme (DNMT1) during several replication rounds; the active DNA demethylation, however, occurs through direct removal of a methyl group independently of DNA replication (Bhutani et al. 2011).

High levels of DNA methylation are associated with genes that have been 'switched off' or silenced (Kruczek & Doerfler 1982). The (de)methylation process is directly involved in many important disease mechanisms such as tumour progression (Baylin & Jones 2016; Kim & Costello 2017).

Histone modification is another epigenetic process, involving an epigenetic modification to histone proteins (proteins that associate with DNA in the nucleus). The modification can affect gene expression by altering chromatin structure—that is, the substance within a chromosome consisting of DNA and protein—or by recruiting histone modifiers (Kouzarides 2007). When histone methylation occurs, specific genes in the cell nucleus may be activated or silenced.[2] Histone demethylation is the removal of methyl groups in modified histone proteins via histone demethylases (Horton et al. 2017). Histone (de)methylation is not a permanent modification but rather a more dynamic process. Like DNA methylation, histone modification has been found to relate to cancer and tumour progression (Zhao & Shilatifard 2019).[3]

[1] For instance, there have been cases where identical twins were raised in the same family, thus having the same DNA and the same environment; yet one of them identified as straight and the other as gay. It puzzles how it is possible. Yet, a plausible explanation is that epigenetics has something do with it.

[2] The genes might not be completely turned on or off; it is more subtle, like a volume dial.

[3] For more on histone modification and its link to cancer, see Bannister & Kouzarides (2011)

The third epigenetic mechanism is non-coding RNA.[4] Non-coding RNAs are a cluster of RNAs that do not encode functional proteins. There is a growing body of literature showing that non-coding RNA plays an important role in epigenetic control and gene expression (Costa 2008; Ghildiyal & Zamore 2009).[5]

What these have to do with philosophical bioethics? First, epigenetic changes are now known to be heritable (e.g., Chen et al. 2005) and thus have intergenerational influence. The patterns of DNA methylation of cells are transmitted through cell division and gametogenesis (production of sperm and ova) to another generation. Research suggests (e.g., Thayer & Kuzawa 2011: 799) that many factors, including nutritional inadequacy and exposure to toxins (such as a mother's smoking), especially in utero, induce epigenetic changes that could last throughout the offspring's life. This raises the question of whether and to what extent we might be responsible for the health and wellbeing of our offspring.

Second, epigenetics relates to our biological aging: how well our body functions and how much we have diseases related to old age. Since bioethicists are interested in justice and morality and because many rights and duties in society depend on one's age, the link between epigenetics and age becomes important from the perspective of ageism and age related rights as well.

Ethics and epigenetics

Although epigenetics is a relatively new field of scientific discovery, some bioethicists have already started to consider its implications for (procreative) ethics.[6] For example, Maria Hedlund (2012) argues for a position holding that epigenetic responsibility should mainly be a political and not an individual responsibility. Dupras and Ravitsky (2016), likewise argue that the nature of epigenetic responsibility is, at best, ambiguous. I will here explain how my positions relate to the work of these and other bioethicists.[7]

In my paper "Epigenetic responsibility thesis", I argue that a poor diet in prospective parents may harm their offspring. Since what we eat today may influence whether our potential future children will live healthy lives or suffer from lifelong illness, prospective parents are, via epigenetic inheritance caused by unhealthy diets, partly responsible for their children's poor health.

[4] While DNA provides the code for the cell's activities, RNA converts that code into proteins to carry out cellular functions.
[5] Non-coding RNA's can be classified by their length. However, both short non-coding RNAs and long non-coding RNAs initiate and sustain epigenetic changes.
[6] I am using the terms procreative ethics and reproductive ethics interchangeably.
[7] For others discussing the link between ethics and epigenetics see Hessler (2013), Meloni & Muller (2018). For epigenetics and intergenerational justice see del Savio et al. (2005).

While lifestyle choices of currently existing people affect through epigenetic patterns the health of relatives in the future, Hedlund (2012) claims that social, economic, political and other structures also affect epigenetic processes. She points out that such structures would directly contribute to physical and mental stress and wellbeing, and thus indirectly contribute by enabling some individual choices while constraining others. Because of this, she thinks we should not assign backward-looking claims on moral blame when it comes to epigenetics.

In effect, since many things beyond our control can lead to epigenetic changes that get passed on to our offspring and thereby contribute to their health, we should not blame people for their choices (such as smoking or drinking) that can affect the health of our offspring in a similar way.

While the idea of epigenetic responsibility has been assumed in the literature, to the best of my knowledge, a carefully structured argument for it has not yet framed. If that is the case, then there is a chance that the view Hedlund (or Dupras and Ravitsky) have argued against is a straw man. For instance, no one, as far as I know, is claiming that an individual is *fully* responsible for and the *only factor* contributing to the onset of epigenetic-related disease in the offspring. Thus, the one purpose I have here is to frame a detailed argument that parents are at least *partly* responsible for the onset of their children's disease, at least in some cases. Contrary to what Hedlund assumes, this does not necessarily mean that we assign (or that we should assign) backward looking claims of blame or, more to the point, that we should somehow morally (or legally) condemn or punish parents whose choices have contributed to the onset of disease in their children. What it does mean is that those who plan to have children should be *aware* of the possibility that their lifestyle choices today may affect whether their future children turn out healthy or not.

Perhaps another problem in my reasoning is, as Dupras and Ravitsky frame it, the ambiguous nature of epigenetic responsibility stemming from epigenetic plasticity and epigenetic normality. Epigenetic plasticity refers to how some epigenetic changes such as histone acetylation may last only a few hours, while others such as DNA methylation may be persistent over a lifetime and may be transmitted across generations (Dupras & Ravitsky 2016: 538). Epigenetic normality refers to the difficulty of defining a reference epigenome against which to judge the normality of someone's epigenetic programming, and the fact that the larger context of the epigenome's occurrence (e.g., cell type, age of the person, microenvironment surrounding the variant) must be understood with precision.

Dupras and Ravitsky argue against Hedlund as well. They claim that her view, wherein epigenetic responsibility belongs mainly to the state, is simplistic, ineffective, and ethically problematic, and that mere *prospective* responsibility without the possibility of holding actors responsible for past

negligence (through health policies or laws) could result in a very limited upholding of the suggested prospective responsibility (Dupras & Ravitsky 2016: 535–536).

I am not arguing directly against the claims made by Dupras and Ravitsky. Instead, I take a step back and frame the initial argument for the epigenetic responsibility thesis in detail. It is plausible that the case of epigenetic responsibility is more complex than what is presented in the current version of the Epigenetic responsibility thesis. The questions of responsibility and justice should, for example, consider more objections as well if we want to make the argument as plausible as possible. For instance, we should also make sure that people have equal access to healthcare if we want them to be concerned about their and their children's health. As Mark A. Rothstein (2009) points out: in some countries, such as the U.S. many individuals who are most likely to have hazardous exposures are among the least likely to have regular, timely and comprehensive access to health care. This and other things further complicate the issue of moral responsibility. While I have not considered all plausible counter-arguments against the position I defend, I still think it is important to frame the argument and offer an initial defence for it.

Epigenetics and ageing

Recently, epigenetics research has focused on biological ageing as well. Numerous studies are showing that people age at different rates and epigenetics is largely responsible for it. Yet, so far bioethicists have remained silent on what consequences these new findings have regarding morality and justice.[8]

Many, including bioethicists, seem still to assume that our age is determined solely by our chronology, that is, the amount of time we have been alive. But there is another concept of age that may sometimes be more relevant: biological age. This concept has been studied in biology and gerontology (the study of ageing) for some time now. While we all age, we do not age at the same rate, and epigenetic modifications are closely related to this phenomenon.

Developments in epigenetics could make it possible to calculate or estimate one's biological age. This is done through so-called epigenetic clocks: sophisticated ways of tracking our "real" age by measuring methylation or demethylation at particular DNA sites (Kanherkar 2014). As said, this age measured by epigenetic clocks tracks our *biological*, not our *chronological* age, by looking at how the pattern of the tags in our epigenome changes during the course of life. The biological age

[8] Jan Baars (2007) who has challenged the use of the concept of chronological age by claiming that chronological age cannot by itself give any precise reference to (a phase of) ageing processes.

thus measured can exceed or lag behind our chronological age, so that a person who is 40 years old chronologically might be 30 or 50 years old biologically.

Results in numerous studies indicate that epigenetic clocks relate strongly to processes that correlate with biological ageing, although it is not obvious whether changes in DNA methylation are the *cause* of ageing or merely a *result* thereof. For instance, major depression has been associated with higher epigenetic ageing in blood, as measured by DNA methylation patterns, suggesting that patients with major depression are biologically older than their corresponding chronological age (Han et al. 2018). Other research has shown the predictive utility of biological age for calculating disease risk; for every 5 years older a woman is in her biological age than her chronological age, her risk of breast cancer increases 15% (Kresovich et al. 2019). It has also been shown that epigenetic clocks predict all-cause mortality in later life better than chronological age (Chen et al. 2016).

More than that, many environmental factors such as air pollutants (Nwanaji-Enwerem et al. 2016), infectious diseases such as HIV (Horvath & Levine 2015), diet, alcohol consumption (Quach et al. 2017), and psychosocial exposures such as stress, adversity, and socioeconomic status (Zannas 2015) can all accelerate the ageing process measured by epigenetic clocks.

Currently, Horvath's (2013) epigenetic clock is perhaps the most accurate one.[9] It is based on DNA methylation data. While epigenetic clocks measure our biological age, it is not exactly clear how they work. In the future, the epigenetic clock may, however, become "a molecular crystal ball for human aging" (Ecker & Beck 2019). That said, epigenetics is not the only way to estimate our biological age; other methods involve using telomere lengths (Fasching 2018) or the so-called frailty index (Goggins et al. 2005).

In the latter part of this thesis, I argue that there are at least three different ways we could understand concepts of age and ageing. That is the argument in "Age and Ageing: What do They Mean?" (Räsänen 2021a). Chronology is just one of these accounts. Our chronology is the age we most often discuss and refer to in our everyday conversations and practices. Our legal systems—and society in general—is also based on the assumption that chronology determines our age. However, in some cases, intuitively, our biological age also seems relevant. I therefore make a moderate case for a legal age change, in "Moral Case for Legal Age Change" arguing that in some cases, society could or perhaps should allow people to change their official age so as to better match their

[9] Recently, three further improved epigenetic clocks have been published: The Skin & Blood clock (Horvath et al. 2018), DNA methylation PhenoAge (Levine 2018), and DNA methylation GrimAge (Lu et al. 2019). The details of these findings are beyond the scope of this thesis.

biological age (Räsänen 2019a). In "Further Defence of Legal Age Change: A Reply to the Critics" (Räsänen 2019b), and in "Age Change in Healthcare Settings: A Reply to Lippert-Rasmussen and Petersen" (Räsänen 2020a) I consider objections raised by my critics and argue that they are not persuasive.[10]

On the moral status of embryos and fetuses

Much bioethical literature focuses on embryos and fetuses. Whether fetuses have moral status is an important issue that I believe I cannot avoid when discussing contemporary issues in philosophical bioethics. More than that, the moral status of fetuses is philosophically interesting in itself, and it relates to some of the other themes in this thesis such as the epigenetic responsibility thesis.

Much of the philosophical and bioethical discussion related to the moral status of fetuses and embryos is, unsurprisingly, focused on the ethics of abortion. The views of philosophers and bioethicists on this topic can be divided into three groups.

First, there are scholars who believe that abortion is immoral (morally wrong) because fetuses have moral status. According to these pro-life scholars (see for instance Kaczor 2015; Beckwith 2007), fetuses and embryos are persons whose life it is seriously morally wrong to end. Since these pro-life scholars believe that morally meaningful human life begins at conception or very soon thereafter, their view naturally entails that not only is abortion wrong, but so is destructive embryo research.

Critics of the pro-life positions often try to refute it by reductio ad absurdum: they try to show that the truth of the pro-life position has highly counterintuitive consequences.[11] For example, many have argued that miscarriage functions as a reductio for the pro-life view (Murphy 1985; McMahan 2002: 165-166; Ord 2008; Lovering 2013; Berg 2017; Simkulet 2017). If the pro-life view is correct, then miscarriages (even those where the woman is not aware of the pregnancy) are much worse than we typically think they are; after all, the embryos that die in these events are, allegedly, persons, so their deaths matter.[12]

Second, there are scholars who believe abortion is morally permissible because fetuses do not have (full) moral status (see for instance Greasley 2017). These scholars think that morally meaningful human life starts at some point during the pregnancy when the fetus develops. In this view, the fetus

[10] For another take on the issue of age change (in Finnish), see Räsänen (2021b).
[11] See also the Methods of Argumentation section of this thesis.
[12] I have criticized pro-life arguments in the context of moral permissibility of infanticide (Räsänen 2016; Räsänen 2018), and the discussion continues. See, e.g.: Rodger et al. (2019); Blackshaw & Rodger (2019a); Kaczor (2018).

either gains moral status (near-)instantaneously during a certain phase of development, such as when the brain has the capacity to sustain consciousness (see Boonin 2002 for such a view); or gradually throughout the long period of development, so that while the early fetus may have no moral status, a newly born infant does have full moral status.

Third, there are scholars who believe that even if fetuses have moral status, abortion is nevertheless permissible. They (such as Thomson 1971 and Manninen 2010) appeal to a woman's right to control what happens in and to her body.[13] In this view, even if the fetus has a moral status similar to you or me, they do not have a right to use another person's body to sustain their own life (since no-one has such a right), therefore abortion is morally permissible.

In the article, "Against the Impairment Argument: A Reply to Hendricks" (Räsänen 2020b), I criticise a new pro-life argument presented by Perry Hendricks (2019). Hendricks' claim is that abortion is morally wrong for the same reasons that non-lethal harm to fetuses is wrong. He thinks that since it is morally wrong to harm fetuses non-lethally, such as causing them to have fetal alcohol syndrome, it is also morally wrong to harm fetuses lethally, seeing as lethal harm is even more serious harm than non-lethal harm. Hendricks believes this offers a way to avoid the contentious issue of the moral status of the fetus. He claims that *even if* the fetus is not a person, abortion is morally wrong because of the *impairment argument*.

The impairment argument can be used as a counter-argument against my claim made in "Epigenetic responsibility thesis". Since I claim it is morally wrong to eat unhealthily because it harms one's future child, Hendricks could say that abortion equally harms one's child, and if I do not accept the claim that abortion is wrong too, then it works as a reductio ad absurdum against my argument.[14] So, to defend my epigenetic responsibility thesis successfully, I should refute the link between the wrongness of non-lethal and lethal harming of fetuses.

I claim that Hendricks is comparing apples and oranges. You cannot achieve the same things when harming the fetus lethally and when harming the fetus non-lethally. Harming, but not killing the fetus, does not achieve the same goals as aborting the fetus (killing it). We simply cannot compare non-lethal and lethal harm to fetuses since other things are not equal.[15]

[13] These scholars might not actually believe fetuses have moral status. More often, they think that even if a fetus has moral status, abortion can still be morally justified. For more on this type of arguments see Methods of Argumentation section of this thesis.
[14] See Methods of Argumentation section for such arguments.
[15] Both before and after my critical take on the impairment argument, others have offered their extensive criticisms of it on different grounds. For criticism of the impairment argument, see: Blackshaw (2019) and (2020); Crummet (2020); Pickard (2020); Simkulet (forthcoming); Lundgren

The article "Twin Pregnancy, Fetal Reduction and the 'All or Nothing Problem'" (Räsänen forthcoming), raises a puzzle for those who generally accept abortions.[16] The argument in the paper draws on the more general problem that has become known in philosophy as the *all or nothing problem* (Horton 2017). It is a problem where, with the same amount of costs to yourself, you could bring about either a good outcome or an even better outcome. Here is one instance of such a case:

> Suppose that as you stroll along a beach one evening a storm suddenly strikes. You soon hear the panicked shouts of two swimmers who will surely not last long in the growing swells. Though you'd like to help them, you're no seaman and the conditions are extremely perilous; if you put out to save them, it is possible you'll all drown. We think most people would agree that, given the risk, you are not morally obliged to save the swimmers. However, it also seems that if you could save even one, this would be morally better than staying on the beach. Nevertheless, suppose that you spot a dinghy on the beach and heroically attempt a rescue. When you reach them, the swimmers are side-by-side and you could pull both into the boat and make it back to shore. However, suppose you save only one, leaving the other to drown. We think most people would agree that if you do put out to save the swimmers, given that you could save both, it is impermissible to save only one. (Ferguson & Köhler 2020: 2452).

I show that the all or nothing problem can be applied in the context of a twin pregnancy. We can illustrate the problem as follows.

> Suppose that you are pregnant with twins. You have three options: either have an abortion, thereby killing the twins; or abort one fetus and gestate the other one, then bear the burdens of a single pregnancy; or save both fetuses and bear the burdens of the (twin) pregnancy.

Now, there are two plausible claims: it is permissible to abort both fetuses, and it is morally wrong to abort just one. But since we should choose permissible acts over impermissible ones, it seems that you should abort both fetuses rather than just one. And this seems odd. A plausible moral theory should not encourage killing two lives if the alternative is to kill just one. In the paper, I defend the idea that this problem is indeed present in fetal reductions of twin pregnancies. An important move here is to defend the idea that reducing a twin pregnancy to a singleton does not decrease the risk of pregnancy, as evidenced by least some empirical studies. A plausible explanation for this is that

(2021). For defences and developments of the impairment principle, see Blackshaw & Hendricks (forthcoming).

[16] *Bioedge.org* describes my approach as "an unexpected blend of pro-life and pro-choice elements, which is bound to upset both."

operating on the womb during the pregnancy always presents a risk to the mother's health, thus mitigating any benefits that the fetal reduction itself would offer.

In the paper, I accepted what others (for instance Ferguson & Köhler 2020) have called the *betterness of permissibility*: the claim that permissible acts are morally better than impermissible acts, which explains why permissible acts should be chosen over impermissible ones. In the paper, I did not think anyone would want to reject this assumption. At least I believe a general version of it cannot be rejected: permissible acts should *often* be chosen over impermissible ones. But perhaps a possible way to solve the problem would be to reject the principle of betterness of permissibility in the context of twin pregnancy.

The puzzle presented in the paper is especially relevant in the context of in-vitro fertilization and embryo transfer. Both these practices normally involve several embryos being transferred into the womb at once in the hope that one of them implants, while also increasing the chance of multiple pregnancies. However, in the Nordic countries, transferring only one embryo has for many years been standard practice (see for example Vilska & Martikainen 2002); and with elective single embryo transfer (eSET)[17], these ethical issues related to a fetal reduction that my work highlights can be bypassed. Of course, the problem does not disappear altogether, since twin pregnancies occur with "natural" pregnancies as well. Increases in the rates of fetal reductions in the U.S (Padawer 2011) shows that the puzzle is still present, and in countries where it is not, it provides an interesting opportunity for applying broader principles of normative ethics to concrete examples in medical ethics.[18]

The non-identity problem and non-existent people

Another way to challenge my epigenetic responsibility thesis is through the non-identity problem. One could claim that our eating habits change the identity of our future children thus we cannot say that eating unhealthily harms anyone since eating healthily would create a different child altogether.

I am not entirely sure whether our eating habits can be understood to alter the identity of our future children – but it may be that many of our actions can do so. If that is the case then eating habits can be identity affecting as well. For instance, suppose I have a choice of eating fast food or creating a

[17] Elective single embryo transfer is a practice where one embryo is intentional transferred into the womb when there are multiple embryos of appropriate stage and quality available.

[18] I thank Trine Skuland and Birgit Kvernflaten for explaining the current practices regarding IVF and embryo transfer in Norway. Thanks to Pekka Louhiala for urging me to find out the ratios of single embryo transfer and double embryo transfer in IVF. For a discussion in Finnish on the topic, see Räsänen (2021c).

healthy meal myself, creating the healthy meal likely takes slightly more or less time than eating fast food, then if I am going to have sex afterwards, the conception is likely to happen a slightly different time than it would otherwise; therefore a different child would be conceived.

Suppose this all is correct, I argue that this does not refute my argument of moral responsibility towards the child. That is we have responsibilities towards our future children – whoever they are – not just some particular genetic individual. That is the main argument in my paper "Defending the De-Dicto Approach to the Non-Identity Problem".

I suspect many of us have, at some point in our lives, wondered who we would be if we had different parents (I certainly have!). Who would I be if my mother had not conceived a child with my father, but instead conceived a child with, say, the King of Sweden? Would *I* then be a prince of Sweden?

Arguably not. The only possible life for *me* is the life I am currently living. If my mother had not met my father, but instead married the King of Sweden, someone other than me would have been born. Instead of my father's sperm fertilizing my mother's egg, leading to the development of me, a different sperm (that of the King of Sweden) would have fertilized my mother's egg, and a different human being would have developed. Put another way, I am *not* identical with the possible child of my mother and the King of Sweden.

In light of this reasoning, in a television series titled *The Root of All Evil*, Richard Dawkins offers the following in praise of the good fortune we may thank for our very existence:

> We are going to die, and that makes us the lucky ones. Most people are never going to die, because they are never going to be born. The number of people who could be here in my place outnumber the sand grains of Sahara. If you think about all the different ways in which our genes could be permuted, you and I are quite grotesquely lucky to be here. (Dawkins 2006.)[19]

Derek Parfit (1984) famously argued that this sort of reasoning leads to an interesting philosophical puzzle. He named it the non-identity problem. The most detailed exploration of the problem (and, to my knowledge, the only monograph solely devoted to the non-identity problem) is David Boonin's "The Non-Identity Problem and the Ethics of Future People" (2014).

Essentially, the non-identity problem arises whenever our actions in the present could change which individuals will exist in the future. Derek Parfit illustrated the problem with the following case:

[19] Someone disposed to anti-natalism would think we had very bad luck when we were born!

> *The 14-Year-Old Girl.* This girl chooses to have a child. Because she is so young, she gives her child a bad start in life. Though this will have bad effects throughout this child's life, his life will, predictably, be worth living. If this girl had waited for several years, she would have had a different child, to whom she would have given a better start in life. (Parfit 1984: 358)

This case is certainly plausible; however, there are many similar cases where the problem arises. One area where the non-identity problem appears is that of modern reproductive technologies. For instance, some in-vitro fertilization clinics offer prospective parents the use of genetic screening to detect whether a given embryo has some specific disability, so that the parents can choose to implant only healthy embryos. Deafness is one of the most-discussed examples. Many people believe that it is immoral for parents to create a deaf child on purpose when they could just as easily create a hearing child instead, but the non-identity problem challenges their position. As David Boonin (2014: 15–16) puts it: "The parents who deliberately create a deaf rather than a hearing child in this manner, after all, do not make that child worse off than that child would otherwise have been."

There have been numerous attempts to solve the non-identity problem. In his book, Boonin evaluates the previous solutions and offers a new one. He argues that since all of the previous attempts are (allegedly) unsuccessful, we should accept the conclusion that creating, say, a deaf child on purpose is *not* wrong. Boonin claims that solving the problem this way is not as implausible as it first appears to be.

In my paper "Defending the De Dicto Approach to the Non-Identity Problem", I criticize some of the arguments Boonin makes. Specifically, I defend one solution to the problem first presented by Caspar Hare (2006) and later advanced and endorsed by Chelsea Haramia (2013) and Derek Parfit (2017). According to this solution, or variations of it, while the parents do not harm any particular genetic individual, they harm their child—whoever he or she will be. In his book, Boonin argues against Hare's de dicto solution by presenting a counter-example against Hare's thought experiment to show that what Hare said could be interpreted in two ways. According to the first interpretation, the claim that the de dicto sense is relevant in Hare's thought experiment is a plausible one; but on that interpretation, procreation does not make the child de dicto worse off. On the other interpretation, procreation seem to make the child de dicto worse off, but it is not possible to say that the de dicto sense applies in Hare's thought experiment (Boonin 2014: 34–35).

In my paper, I try to mirror Boonin's thought experiment so that it generates opposite intuitions (at least for some), and thus does not refute the de dicto solution to us all. If I am right and the de dicto solution can be adequately defended, then the parents should choose the embryo without the 'blind'

(or ‘deaf’ or ‘diabetic’) gene; that is, they should choose the better off child rather than the worse off child. This could then lead to the principle of procreative beneficence: that we should always choose the best possible children out of all possible children when we procreate (Savulescu 2001). While some might see this as a reductio of the view I am defending, perhaps others will be persuaded.

One important issue related to the idea presented in the paper is whether deafness, blindness, or other “disabilities” can be said to harm the person. In the paper, I do not consider in detail whether conditions such as blindness or deafness amount to disabilities or mere differences. There are different views on this issue, and the current version of the paper does not participate in that discussion, although this is probably needed in order to solve the paper’s main problem in a fully satisfactory way.

Those who hold the mere-difference view of disability (Barnes 2014; 2016) say that being disabled is not itself bad, and only becomes bad when society treats one badly because of one’s disability. Similarly, it is bad to be a woman in a sexist society, but it is bad because society is sexists, not because there is something inherently bad about being a woman.

Those who hold the bad-difference view of disability claim that disability is bad in and of itself (McMahan 2005). They often make the argument that if a disability is not bad in and of itself, then it would not be bad to cause people to be disabled (Kahane & Savulescu 2016).[20]

Some might suspect that the view I present and defend is *ableist*, that is, discriminatory against disabled people. I have been told that it is important to avoid singling out any particular group that already faces social injustices, and that the paper—which argues that it would be better if the members of that group did not exist—expresses discriminatory attitudes towards such people.[21]

However, my claim is not that the world would be a better place if some disabled person would not exist. My view is that the world would be a better place if some non-disabled person would exist instead of that disabled person. For some, this might sound even more ableist. That is because it would not only mean that it is bad for disabled people to exist with the disability and that it would be better if that person would not have the disability. Instead, it would mean that it would be better if not that particular individual would exist without the disability but it would be better if someone, a totally different person, would exist instead. So it would not only mean that the disability is bad, it would in a way deny that particular individual’s whole right to exist.

[20] See also Glover (2006) on the wrongness of choosing disability.
[21] For instance an anonymous reviewer at the *Medicine, Healthcare & Philosophy* raises this worry.

However, while I think the world would be a better place if some non-disabled person exists instead of a disabled person, the reason for this is that I also think that the world would be a better place if, for instance, some other better-off person would exist instead of myself, or some other non-disabled person. So, the world would be a better place if (other things being equal) someone, for example, with a slightly better eyesight would exist instead of me. While this view might sound odd to some, I think it is reasonable. In fact, I think there is something unreasonable in the claim that my existence is special. While it is true in some way that there is something special about my existence—it is, after all, special and good for me—I think it is perfectly rational to say that my existence does not make the world a better place if there were some better-off individual who could have been instead of me. And I think morality is about what is good in general, not what is good for me.

I admit that this issue quickly grows very complex, and a more detailed defence of such an idea should probably be presented. Nevertheless, I hope that in some of these papers, such as the one defending the de dicto approach to the non-identity problem, I have managed to propose preliminary ways of how this sort of bio-utilitarian reasoning can be applied in the context of procreation ethics.

Here, someone might also object that I have falsely assumed a utilitarian framework without considering rival moral theories, such as deontology or virtue theory. In this thesis, I do not go into details regarding different moral theories. My reason for this is that when we argue in applied ethics, what matters is not which moral theory one holds, but which arguments one makes and whether they are persuasive. Some arguments and claims can be accepted (or rejected) by all of those who have different moral theories in their background. For instance, in "Epigenetic responsibility thesis", my conclusion is (roughly) that people who are going to have children should not eat unhealthily. Consequentialists might think this claim is correct because eating unhealthily harms the child, while deontologists might say people have a right not to be exposed to significant risks or harm. Similarly, in "Moral Case for Legal Age Change", when I argue that some people should be allowed to change their legal age to avoid discrimination, a utilitarian could say that this is true because age change does not harm anyone and benefits the person changing age, so that age change leads to good outcomes. Meanwhile, a deontologist could say that, regardless of consequences, people have a right to self-identify however they see fit, and the law should respect people's identities even when they would identify as younger than they chronologically are. Of course, both deontologists and utilitarians could reject the arguments as well.

Another reason for why I do not much discuss about moral theories is that, as I argue in "Liberal utilitarianism—yes but for whom?" (Räsänen 2021d), the more important question concerns who we see as belonging to our moral community. For instance, suppose our interest is in whether it is (im)permissible to eat non-human animals. It is crucial to first determine whether animals are the

sort of beings whose interests we should be concerned about, and we cannot decide that by simply choosing either utilitarianism or deontology. Both deontologists (Regan 1983) and consequentialists (Singer 1975) can say that animals deserve our moral consideration, and I am sure there are utilitarians and deontologists who, conversely, think animals are not the sort of beings whose life it is seriously morally wrong to end.

Personally, I have sympathies with both utilitarianism and liberalism. Therefore, I am inclined to think that some revised version of Häyry's liberal utilitarianism (Häyry 1994; 2021) is indeed a plausible moral theory.

Methods of argumentation

In this section, I explain the methods of this research. That is, I explain *how* I argue. As a philosophical thesis, this work does not contain any empirical data, yet I still use certain methods; certain *ways* to argue. I have already briefly discussed why I do not start by applying different moral theories. Here, I will explain what I think are the most useful tools for philosophical bioethicist.

Philosophy as an academic disciple is mostly about disagreement, so there is no doubt some disagreement on the methods philosophers use. Thus, one might claim that the methods I have used are not the ones I should have used. Nevertheless, my aim here is not to invent new methods altogether, but to use those methods that are commonly used in applied ethics. So, here I will justify my methodological choices, and spend some time explaining how these methods are commonly used in applied ethics to illustrate their power.

Reflective equilibrium and parity of reasoning

Perhaps the most common methodology in applied ethics is what John Rawls (1971) called *reflective equilibrium*. This is an iterative process where we refine our principles to better fit for our considered judgements. Those judgements that are felt to be mistaken when the principle fails to explicate them are discarded (ibid: 188).

The main idea underlying this view of justification is that we "test" various parts of our system of beliefs against the other beliefs we hold, looking for ways in which some of these beliefs support others (Daniels 2020). In doing so, we seek coherence among the widest set of beliefs and revise and refine them at all levels when challenges to some arise from others.

This process is continued until, ideally, we have reached a state of reflective equilibrium. This is the state where one or more coexisting principles explicate our considered judgements with the

greatest possible simplicity and elegance (Rawls 1971: 186). In other words, we reflect on and adjust our moral beliefs when faced with ethical challenges. In this process, we should not only modify prior beliefs, but also add new beliefs if and when needed.

Carl Knight (2017: 46) gives a simple example of the process: "For instance, if I am considering the principle that it is always wrong to lie, but have the judgement that it would not be wrong to lie in order to save a life, I can reach equilibrium by revising either the principle or the judgment."

So, we can either revise our principles or revise our judgements. If the method succeeds and achieves reflective equilibrium, we arrive at an acceptable coherence among these beliefs. At a minimum, our beliefs should then be consistent with one another. Applied ethics is thus not just applying principles in normative ethics (of course it can be that too) but it also means that we can and should revise those broader ethical principles when challenges arise.

A close relative of reflective equilibrium is known as *parity of reasoning argumentation*. Parity of reasoning says that no matter what reasons we have for assigning a certain moral attitude to one practice, we should apply the same moral attitude to a relevantly similar practice.[22] The crucial question then becomes what one counts as relevantly similar practices.

For instance, many opponents of abortion note that the justification of abortion by bodily integrity arguments not only justify early abortions but late abortions as well. Some claim, in turn, that the justification of late abortion by the moral worth of the fetus would equally justify infanticide. So, the practices of abortion and infanticide are relevantly similar, one could claim. And on the other hand, one could note that by parity of reasoning those who object to early abortion should equally be concerned about natural miscarriages and how we should prevent them.[23]

The logic here is that the views held by the opposition are either wrong because they lead to ridiculous conclusions, or are incoherent because they cannot be followed to their logical conclusions. It has been claimed that all current views in bioethics and possible all ethical stances have shortcomings of this type (Häyry 2010: 45). Although these shortcomings may sometimes be explained away; however, as Häyry (2010: 45) points out, more often they show that no positions are fully rational and completely free of funny or odd conclusions—especially in the eyes of its adversaries.

[22] For more on parity of reasoning arguments in bioethics, see Holm (2003).
[23] For a discussion of spontaneous abortion as a reduction against pro-life position, see Blackshaw & Rodger (2019b) and Hershenov (2020).

Consider an example relevant to the Epigenetic responsibility thesis. Jessica Flanigan argues that it is permissible for pregnant women to cause prenatal injury. She claims that arguments supporting the claim that prenatal injury is wrong, cannot be accepted without denying the permissibility of other, arguably permissible, maternal choices. Flanigan uses the following example.

> [I]magine a pregnant Somali woman decides to give birth and raise her child in Somalia, where there is poor nutrition and limited prenatal care, even though her uncle arranged for her to move to the UK before the birth. Is she required to flee her home country because Somalis have a lower quality of life and shorter life expectancy? (Flanigan 2021: 34)

Flanigan thinks the answer is no. But, at least I would think the answer is yes. The woman should move to the UK. So, depending on one's intuitions, these types of arguments serve either as a reductio against the view (that inflicting prenatal harm is wrong) or as conclusions of the argument we should follow (the Somali woman should move to UK to give her baby a better start in life). As Matti Häyry (2010: 225) beautifully frames it: "parity of reasoning arguments polish the rails leading from one normative position to another, but where the train ends up depends on the direction in which our moral intuitions steer it."

Thought experiments and arguments from analogy

My work relies heavily on thought experiments. Thus, I want to explain here what purpose they have and how thought experiments are generally used in applied ethics. Thought experiments are frequently used in philosophical argumentation, sometimes when using parity of reasoning. Thought experiments can be used for several reasons, but are most often used to support or refute a premise. This way, they can be used as a part of parity of reasoning argumentation by showing that a certain practice is relevantly similar to some other practice.

As an example, of a thought experiment in the context of reproductive ethics consider the now-famous thought experiment by Judith Jarvis Thomson. The upshot of it is that even if the fetus is a person and requires the use of the woman's body to live, the woman has no obligation to allow it to use her body.

> *Famous Violinist:* You wake up and find yourself in a bed attached to an unconscious famous violinist. He has been found to have a fatal kidney ailment, and the Society of Music Lovers has attached him to you since you alone have the right blood type to help. A doctor tells you now, "We're sorry you have been plugged to this person, we would never have allowed it if we had known. But to unplug him now would kill him. Nevertheless, it's only

for nine months and after that he will cover from his ailment and can safely be unplugged from you. (Adepted from Thomson 1971).

Thomson asks (1971: 49): “Is it morally incumbent on you to accede to this situation? No doubt it would be very nice of you if you did, a great kindness. But do you have to accede to it?”

One might think that you must accede, since the violinist is a person whose right to life requires that you stay plugged in. While you have a right to decide what happens within and to your body, a person's right to life outweighs this right of yours. So, you cannot be unplugged from the violinist. However, Thomson thinks this response is wrong. She concludes (1971: 49): “I imagine you would regard this as outrageous, which suggests that something really is wrong with that plausible-sounding argument.” So, Thomson's idea, roughly, is this: a right to life is different than a right to use another person's body to sustain life.

In the above example, Thomson assumes that people in general have the same intuition as she does: namely, that you are not obligated to remain attached to the violinist. If they share this intuition and *Famous Violinist* is sufficiently analogous to abortion, they should conclude that abortion is not immoral just because a fetus is a person. If Thomson is correct, pro-lifers needs to do more than show that fetuses have a right to life if they want to convince others that abortion is immoral.

David Boonin and Graham Oddie (2010: 10) explain in detail how a specific category of thought experiments, namely arguments from analogy, are used in applied ethics. Basically, arguments from analogy try to justify our accepting of moral assessment of a particular practice by comparing it with another practice about which most people are already in agreement. Such arguments can be represented in the following way:

P1: Practice 1 is wrong.

P2: Practice 2 is morally analogous to (morally on a par with) practice 1.

C: Practice 2 is wrong.

Boonin and Oddie say that criticizing arguments from analogy can done by either trying to refute the first or the second premise. So, a critic could try to contest the argument by either denying that practice 1 is wrong (i.e., challenging the assessment of the example offered by the author), or by identifying a morally relevant disanalogy between the two cases.

If we use Thomson’s famous violinist as an example, and use the first strategy, a critic could deny the intuition that it is morally permissible to unplug yourself from the violinist. One could therefore

claim that it is indeed morally wrong for you to detach yourself from the violinist and you should, morally, stay attached.

If critics use the second strategy, they must offer a disanalogy between a pregnancy and *Famous Violinist* and explain why that particular difference matters morally. For instance, one could claim that a pregnant woman (in most cases) has consented to sex and thus has tacitly consented to gestate the fetus if she becomes pregnant. However, in the violinist case, the person attached to the violinist was attached to him without her consent. If consent is the morally relevant difference, then because the cases are disanalogous, *Famous Violinist* does not support the view that it is morally permissible to have an abortion.

To see whether consent is a morally relevant feature, we can alter the original *Famous Violinist* case so that the person attached to the famous violinist has given her consent to the practice. We thereby create a variant case that is just like the original *Famous Violinist*, but which has been altered to correct the consent variable:

> *Famous Violinist with Consent.* A famous violinist has been found to have a fatal kidney ailment, and the Society of Music Lovers has discovered that you alone have the right blood type to help. They approach you with a plea to help them by voluntarily having the famous violinist attached to you for a period of nine months. If you do not help him, he will die. You consider their proposal and eventually consent to the procedure because you want to help. However, after a few weeks you start to feel nausea, back pain, fatigue, and other mild pains and discomforts. Because of this, you decide to detach yourself from the violinist, causing him to die.[24]

If, after consulting your intuitions on the above case, you still think that it is morally permissible for you to detach yourself from the violinist, then consent turned out to be irrelevant after all. If, on the other hand, you believe that the fact that you did consent to be attached to the famous violinist makes all the difference in the world—such that you are now morally obligated to remain attached for the nine-month period—then for you, at least, we have found the morally relevant feature. This would imply that abortion would be morally permissible in case of a rape, but not in other cases of pregnancy. Ultimately, the result depends on whose intuitions we rely on.

So, what kind of thought experiments are good thought experiments? Kimberly Brownlee and Zofia Stemplowska (2017) offers some advice on how to create a good thought experiment. Here, I explain what I think are some important and interesting features of thought experiments.

[24] I used similar reasoning in my Finnish reply. See Räsänen (2021e).

One (perhaps surprising) caveat when designing a thought experiment is that the thought experiment could be too similar to the real-world issue we want the thought experiment to highlight (Brownlee & Stemplowska 2017: 33–34). If one creates a thought experiment that is too similar to the case requiring our moral evaluation, then it becomes difficult to ensure that none of the features the thought experiment is meant to test are not being assumed already.

Here is an example that I think suffers the problem of being too similar to the issue whose moral evaluation we want to test:

> *Attached Embryo*: a woman transfers an embryo into her womb. The embryo then implants in her womb. If she carries the embryo to term, she will give birth to a healthy child. If she has an abortion, the embryo dies. Is she morally obligated to gestate the embryo?

Here, there are very few disanalogies with pregnancy. For instance, it cannot be said that the implanted embryo is unnatural or not in line with the function of the woman's reproductive organs. Additionally, to "unplug" oneself from the embryo is in this case not merely analogous to abortion; it *is an instance* of abortion. Furthermore, it is not the case that unplugging oneself from the embryo does not involve killing, while aborting it does, since, again, to unplug oneself here amounts to abortion.

Now, I believe the intuitions in this case differ. Those who already accept the pro-choice position would believe that the woman is not morally obligated to gestate the embryo, and those who already accept the pro-life position would believe that the woman is not allowed to detach herself from the embryo. Because it is so similar to the contested issue of abortion, this case does not generate any new intuitions; we simply apply our previous intuitions from abortion to this case. Thus, the thought experiment assumes what is to be tested, and hence does not prove anything.

So, when I create thought experiments, I try to make sure that the cases are a bit far-fetched, so that they are not too close to those cases whose moral evaluation we want to test. But when thought experiments involve a denial of a standard feature of the world, one should hypothesize, even roughly, how this can be done (Brownlee & Stemplowska 2017: 34–35).

For instance, when I try to show that our chronological age does not (always) matter, I construct a case wherein a person does not age biologically. However, I also tried to hypothesize how such a case could have been possible, or at least plausible:

> *Anti-ageing pill*. Scientists have discovered a 'cure' for biological ageing. When a person takes the anti-ageing pill, it stops her biological ageing process. Diane, chronological age of

> 40, takes the pill. After 50 years, Diane's body is still physiologically indistinguishable from that of an average 40-year-old woman.

Arguments from analogy come in various shapes and forms. For instance, in this case, I did not try to make a moral evaluation. I simply tried to show that our concept of age can be understood in different ways, and that in some cases and for some people, biological age seems more relevant than chronological age.

So far, we have seen how arguments from analogy work and how they can be criticized. In the dissertation, I use arguments from analogy in several articles, including "Epigenetic responsibility thesis", "Schrödinger's fetus", and "Moral case for legal age change". In "Scrödinger's fetus", I proposed that early fetuses have undetermined moral nature.

I attempt to combine something from both pro-life and pro-choice camps, forming an account that could accept commonly held intuitions that often seem to be contradictory: the claim that 'I' was once an early fetus, yet that early abortions do not actually kill anyone.

Prior to "Schrödinger's Fetus", Elizabeth Harman (1999) challenged the commonly held belief that two fetuses with similar health and similar development could have different moral status. Harman's actual future principle states that the actual future (whether the fetus lives or not) defines its moral status. My paper advances Harman's view. I constructed the following scenario, which I hope shares morally relevant features with the moral and metaphysical nature of fetuses.

> *Loving Couple.* A married loving couple looks back on their relationship and wonders when exactly their relationship started. The couple concludes that the relationship started on the very first date. It has since lasted to the moment they are in now, and perhaps it will last into the future, too. The couple reason, however, that if the relationship had ended before, say, the third date, then the relationship would not have existed at all. The two dates they already had would not yet count as a relationship.

For me at least, it makes sense to believe that if they have not had their third date, they have not had a relationship, while at the same time believing that since they had their third date, their relationship started on the first date. Put another way, the couple cannot simply reason at the time of the second date: is this a relationship yet? Only later can it be said whether it was a relationship at the time of the second or first date.

Now, if the case is analogous regarding morally relevant features of fetuses, and if one agrees on my intuition regarding *Loving Couple*, then I have shown that fetuses likewise have undetermined moral nature. If I am right, then the following view seems correct:

> *Schrödinger's Fetus.* A pregnant woman wonders whether her early fetus is a person yet. She reasons that a being's future is a part of what that being already is now. Whether her fetus is a person, depends on the future the fetus will have. Whether her fetus is a person with a moral status or right to life cannot be determined now, but only later, when the fetus has or has not gained consciousness, at which point the actual future of the fetus is known.

As seen earlier, one could contest my reasoning by denying the assumed intuition in the case of the Loving Couple. Then one should either accept that there is no indeterminacy in the status of the couple's relationship: either they had a relationship at the time, even if it had ended; or what they had at the time was not yet a relationship, and their relationship started later. Another way to challenge my argument would be to offer a possible disanalogy between the cases, and create a variant case to see whether the proposed difference is morally relevant.[25]

In "Moral Case for Legal Age Change", I make the following analogy.

> Certain minorities, such as Muslim immigrants, are often discriminated against in hiring because of their foreign names. Studies in Sweden have shown that when immigrants have changed their names, they have faced less discrimination in hiring and their annual earnings have increased substantially. Similarly, if those who are discriminated against because of their age had the option to change their legal age, they would face less discrimination in hiring and at the workplace.

The idea here is that changing your (official) age would help you avoid age-based discrimination, just like changing your name would help you avoid cultural or racial discrimination. Thus, I claim that the idea of age change is analogous to name change in a morally relevant way. Again, one could either reject the intuition and claim that name change should not be allowed (or that the empirical studies showing it reduces discrimination are mistaken), or reject the analogy and claim I have missed some morally relevant differences between the cases.

Bare-difference arguments

In *bare-difference arguments,* a methodology closely related to thought experiments, one presents two cases that are identical except for one crucial difference. Arguments of this kind try to show that the bare difference between the cases does or does not matter.

[25] For a criticism of Schrödinger's Fetus, see also Blackshaw (2020).

Bare-difference arguments are quite similar to scientific experiments. By holding all other features fixed, we can detect whether the change in one variable makes some difference. Roy Perret illustrates this idea with the following example:

> We can determine the significance of the presence of free oxygen for combustion by lighting two identical candles and then placing one in a bell-jar. After a while the candle in the bell-jar goes out, as the oxygen is consumed, but the candle outside the bell-jar in the presence of free oxygen continues to burn. We conclude that free oxygen is indeed necessary for combustion. (Perrett 1996: 132)

Likewise, we can run different scientific experiments to rule out features that are not relevant:

> Suppose instead we want to determine whether the colour of the candle makes a difference. We select two candles exactly similar in every respect but colour and light them next to each other in the presence of free oxygen. We find both burn similarly and we conclude that the colour of the candle is irrelevant for combustion (Perret 1996: 132–133).

How, then, can the above ideas be used in philosophical bioethics? We can construct scenarios wherein, like the scientific examples, we change only one variable while keeping other things equal. Then we consult our intuitions.

To illustrate bare-difference arguments, consider a famous argument by James Rachels. Here Rachels is interested in whether killing is itself morally worse than letting die. The idea is to show that active euthanasia is not morally worse than passive euthanasia.

> *Murder.* Smith stands to gain a large inheritance if anything should happen to his six-year-old cousin. One evening while the child is taking his bath, Smith sneaks into the bathroom and drowns the child, and then arranges things so that it will look like an accident.
>
> *Accident.* Jones also stands to gain if anything should happen to his six-year-old cousin. Like Smith, Jones sneaks in planning to drown the child in his bath. However, just as he enters the bathroom Jones sees the child slip and hit his head, and fall face down in the water. Jones is delighted; he stands by, ready to push the child's head back under if it is necessary, but it is not necessary. With only a little thrashing about, the child drowns all by himself, "accidentally," as Jones watches and does nothing. (Rachels 1975: 78–80)

Rachels then reasons as follows.

> Now Smith killed the child, whereas Jones "merely" let the child die. That is the only difference between them. Did either man behave better, from a moral point of view? If the

> difference between killing and letting die were in itself a morally important matter, one should say that Jones's behaviour was less reprehensible than Smith's. But does one really want to say that? I think not.

If people think as Rachels does, they will have the intuition that what Smith does in *Murder* is no worse than what Jones does in *Accident*. Thus, what each man does is equally wrong.

Boonin and Oddie (2010: 14) frame the general structure of the bare-difference argument as follows:

> P1: Case A has feature P, and case B is exactly like case A, except that it has feature Q rather than feature P.
>
> P2: Case A is morally on par with case B.
>
> C: P is, in itself, morally on par with Q.

There are two ways to criticize bare-difference arguments. One could attack the first or the second premise of the argument. If one attacks the first premise, one tries to contest the claim that the two cases are alike except for the one feature. Another way is to contest the second premise and our alleged intuitions regarding the cases.

For instance, Scott Hill (2018) argues against Rachels' case by claiming that the difference between killing and letting die is not the only thing that differentiates the two cases. Specifically, the subject who lets die has both the ability to kill and the ability to let die, while the subject who kills lacks the ability to let die. So, there is more to Rachels' scenarios than the bare difference he presents. When the cases are restructured so that both subjects have the ability to let die, our intuitions show that killing is indeed worse than letting die. To understand this, consider Hill's case:

> *Accident + Murder*. As before, Jones sneaks into the bathroom planning to drown his cousin, and, as Jones enters, the child hits his head and falls face down in the water. But Jones refuses to let his cousin die. Instead, Jones insists on killing him. (Hill 2018: 768)

It is supposed to be obvious that what the subject does in *Accident + Murder* is morally worse than what the subject does in *Murder*. Since the only difference in these cases is that in *Accident + Murder*, the subject kills, while in *Accident*, the subject merely lets die, killing itself makes the case worse. Thus, killing is worse than letting die.[26]

[26] For a criticism of Hill, see Kopeikin (2021).

I use bare-difference arguments in the paper "Age and Ageing: What do they mean?" to show that chronological time is (sometimes) irrelevant when it comes to our age. Consider the following two cases:

> *Cryopreservation while alive*: In the near future, it has become possible to preserve living humans at ultra-low temperatures and wake them up after several decades. This technology both pauses their biological ageing process and keeps them unconscious throughout, effectively enabling people to subjectively 'travel' to the future. Alex, chronological age of 40, wants to be cryopreserved for 50 years and then woken up. Once 50 years have passed, Alex wakes up in the body of her 40-year-old self, with no recollection of the time she spent in cryopreservation.
>
> *Cryopreservation while dead*: In the near future, it has become possible to medically kill humans, cryopreserve their bodies, and reanimate them later. This technology enables people to subjectively 'travel' into the future. Bianca, chronological age of 40, wants to be killed and woken up in 50 years. She steps into a machine that kills her and then freezes her body. When 50 years have passed, Bianca is reanimated in the body of her 40-year-old self.

I reason that, in the first case, Alex is chronologically 90 years old when she wakes up, because she was alive and existed during the period of her cryopreservation. However, in the second case, Bianca is chronologically 40 years old upon reanimation. The bare difference between the cases is the amount of time they have spent alive.

But is the mere difference in their chronology relevant? It does not seem to be. Many rights and duties depend on how old one is. If Alex is 90 but Bianca is 40, then Alex should, for instance, be entitled to retirement benefits more than Bianca. But that does not seem correct. If you believe that Alex and Bianca should be treated similarly when it comes to age-related rights and duties, the easiest explanation for this is that Alex and Bianca are the same age in some morally relevant way, and that the bare difference in their chronological age does not matter.

To fulfill another important feature of thought experiments—ensuring that the thought experiment translates into a valid argument (Brownlee & Stemplowska 2017: 30–33)—we can restructure my reasoning as follows:

> P1: *Cryopreservation while alive* has a feature of the subject being alive, and *Cryopreservation while dead* is exactly like case *Cryopreservation while alive* except that it has feature of the subject being dead rather than feature of the subject being alive.

P2: *Cryopreservation while alive* is on a par with *Cryopreservation while dead* regarding subjects' age.

C: Being alive is, in itself, on a par with being dead regarding the subject's age.

Now, one might object here that I have not shown that the people in the cryopreservation cases have not aged, I have only shown that they are the same age. That is, one's intuitive reply to my case would be to deny the claim that neither of them aged. However, given our age-related rights and duties, I think it is much more plausible that neither of them have aged.

Arguments by process of elimination

Another way to argue in applied ethics is by the process of elimination (Boonin & Oddie 2010: 21-22). This argumentation method is essentially destructive. It does not necessarily provide a positive argument for a thesis, but rather a negative argument against other plausible arguments that have or could have been made.

Argument by process of elimination is not ironclad. One could reject dozens of arguments and still, someone could raise a whole new counterargument that has not yet been considered, or revise and strengthen the objections that have been rejected before. Be that as it may, if one can show that all of the seemingly plausible arguments for a given conclusion do not work, this can establish a much stronger justification against such a thesis than without rejecting such arguments.

I use arguments by process of elimination in, for instance, "Moral Case of Legal Age Change". In the article, I show that various charges against the practice of allowing people to legally change their age can be successfully overcome.

This method is not fully distinct from other ways to argue in applied ethics. For instance, one could combine arguments by analogy with arguments by process of elimination and claim, for instance, that because sex change is permissible, age change should be permissible as well. In "Moral Case for Legal Age Change", however, I try to make an independent case that would work whether or not one accepts the claim that sex change is both plausible and permissible. After making the initial defence of legal age change, I consider and reject six immediate objections against the view that age change should be allowed.

When criticizing arguments by process of elimination, one could either offer a whole new argument that has not been considered before, or argue that at least one of the arguments has failed to prove what was addressed. In "Further Defence of Legal Age Change: A Reply to the Critics", and "Age-

change in Healthcare Settings: A Reply to Lippert-Rasmussen and Petersen" I respond to some new counter-arguments my critics raise, hopefully strengthening the case for legal age change.

Arguments by reduction to absurdity

Yet another common method is arguments by reduction to absurdity (*reductio ad absurdum*). This is a simple and popular method in applied ethics (Boonin & Oddie 2010: 22–23). The basic idea is to show that the conclusion of the argument is absurd, something we should not accept; and that therefore the argument itself should be jettisoned.

The argumentation comes in two forms. First, one could show a logical contradiction in some particular argument, such as:

> B is true and B is not true.

The other form involves showing that some particular argument leads to a conclusion that is clearly wildly implausible. Here is one way to construct such an argument:

> P1: A entails B.
>
> P2: B is wildly implausible.
>
> C: A is wildly implausible.

I use arguments by reduction to absurdity in "Epigenetic responsibility thesis". In response to Kingma and Woollard's view on harming fetuses by alcohol consumption while pregnant, I argue that on this view requires us to accept conclusions that are wildly implausible. Here is one way to frame my argument against their view:

> P1: K&W's argument that pregnant women cannot harm their fetuses also entails that drug addicts cannot harm their fetuses when using drugs while pregnant.
>
> P2: It is wildly implausible to claim that drug addicts cannot harm their fetuses when using drugs while pregnant.
>
> C: K&W's argument that pregnant women cannot harm their fetuses is wildly implausible.

One could challenge my argument by rejecting the first premise, and thus the supposed relation between their claim that pregnant women cannot harm their fetuses and my supposedly absurd conclusion; or by rejecting the second premise that it is wildly implausible that drug addicts cannot harm their fetuses when using drugs while pregnant. Maybe Kingma and Woollard are willing to accept where their argument leads: that using drugs while pregnant does not harm the fetus.

However, I suspect that such a conclusion would strike too many as wildly implausible, and thus their argument should be jettisoned—or at least they will not convince many people. Nevertheless, even if I am wrong, I hope I have managed to show that Kingma and Woollard's argument leads to conclusions that they may have not initially realized.

The polite bystander's perspective

Previous argumentation methods seem to assume that if one merely creates good enough thought experiments, considers and refutes a plethora of objections, and then argues until the cows come home, one could persuade others to accept one's thesis. However, the answers we give to many of the central questions in bioethics will depend crucially upon the particular rationality we adopt. This is the claim Matti Häyry offers in his "Rationality and Genetic Challenge" (2010). Häyry argues that it is a mistake to claim that there is a single rationality in bioethical debate.

In some of the papers, I apply Häyry's polite bystander's perspective. So rather than arguing for some specific view to be true, I claim that there are many different conclusions one could reach, depending on one's background assumptions and intuitions.

A polite bystander is someone who will politely and from a distance describe competing views, study their interpretations, and formulate possible evaluations from them (Häyry 2010). The bystander's role here is not to provide a definite answer on who is right, but rather to discover who *might* be right.

While Häyry uses his approach in what he calls *genethics*[27], there is no reason to limit the methodological approach to genethics only. John Coggon (2011), one of Häyry's critics, claims that the polite bystander's perspective may both be used in ethics much more widely—and I would add philosophy in general.

I am not entirely convinced that Häyry's approach is *the* right one. However, I think it has its merits. For instance, in philosophy and closely related fields like bioethics, disagreement is common. When intelligent and educated people disagree with each other on crucially important topics, I think it is important to remain polite. It is also important to understand that people from different backgrounds will have different intuitions and initial reactions to cases where some think there is only one way to believe. These different intuitions give different answers to the questions we explore.

[27] Genethics is the study of the ethical issues that arise out of the science of genetics and the uses of genetic technologies. For more on genethics, see Lewens (2004).

However, one problem with Häyry's approach is the following. If solving an issue means we should be able to convince everyone who initially are on an opposite side, then obviously philosophers cannot solve anything. Yet, if solving something is understood in this way, then, for example, the issue of whether evolution is true has not been solved. But surely, solving an issue does not mean the argument should convince everyone. Solving a (moral) problem can be done by offering a valid argument from true premises.

However, given the merits of Häyry's approach, and because I think that plurality of methods in philosophical bioethics is a welcome trend in itself, I have used it in some of the papers.

Methods involving the polite bystander's view is best seen in the paper "Age and Ageing: What do They Mean?" where I argue that there are different plausible approaches to age and ageing one might reasonably adopt. While I have my favorites among them, I claim that none of them is obviously the right one, and that adopting any one of them might be someway problematic—even if it is, at least in some people's views, rational.

The article takes an ordinary concept—age—that has not been widely challenged, and argues that it can reasonably be understood in many ways. Normally it is obvious how we determine someone's age, but I challenge this notion by combining the polite bystander's approach, thought experiments, and recent findings in biology and epigenetics. I offer thought experiments to show what we think (and what we perhaps should think) about age and ageing when there is a mismatch between our biology, chronology, and experiences.

For instance, suppose we could bring some historical person back to life. How old would they then be? Let us say Napoleon was brought back to life. Would he then be 51 years old, as he was when he died in 1821, or would he be 252 years old, since that is how long it has been since he was born (at the time of writing this)? While some people might claim there is an obvious answer, I believe many of these "obvious" answers will be quite different from one another.

In the article, I present several cases where a person's chronology, biology, and experience differ in some crucial sense, and analyze how we intuitively respond to the question of how old such a person is. I do not argue that any one view is the superior over the other. What one considers the right answer probably depends on one's background assumptions.

Another paper where I have Häyry's approach in the back of my head is "Twin Pregnancy, Fetal Reduction and the 'All or Nothing Problem'". In that paper, I apply a puzzle called the *all or nothing problem* in the context of abortion. I argue that there are different ways to solve the problem, and

that different people with different backgrounds and rationalities will tend to solve the problem in different ways.

Links between the papers

So far, in this introductory section of the thesis, I have explained the science and ethics behind epigenetics, introduced the non-identity problem and explored different views on the moral status of embryos and fetuses. I have also explained how philosophers working in applied ethics argue and justified my methods of study. Before going into the papers themselves, I want to explain how the papers contribute to answering my research question and what the links between the individual papers are.

The thesis consists of ten individual papers which answer my research questions. The papers are linked together one by one like train carriages. Some papers defend the ideas built on previous papers and some papers consider new objections that can be applied against the previous papers.

I start with the "Epigenetic responsibility thesis". This paper is a natural starting point since it considers what might happen for people who do not yet exist if we do or do not certain actions such as eat unhealthily. This paper and a couple of next papers are focused on the ethics of the beginning of human life. The last papers of the thesis focus on the later stages of human life.

The ***Epigenetic responsibility thesis*** argues that sometimes people are partly morally responsible for their children's well-being and illness. In the paper, I frame the argument and consider on an intriguing counter-argument proposed by Elselijn Kingma and Fiona Woollard. I argue that their argument is not convincing, or at least it comes with a bullet to bite.

The second paper, ***Against the impairment argument: a reply to Hendricks*** considers another plausible counter-argument against the epigenetic responsibility thesis. Hendricks argues that since non-lethal harm to fetuses is morally wrong, so lethal harm (abortion) must be wrong as well. In my paper, I refute this argument which can be deployed against my epigenetic responsibility thesis in the following way: if I believe that harming fetuses non-lethally, as the argument in the first paper claims, then I should also believe that abortion is immoral because it harms the fetus lethally. I think this argument is not successful, and thus can be added to the list of pro-life arguments that are not convincing (Räsänen 2016; 2018).

The third paper, ***Defending the de-dicto approach to the non-identity problem*** also considers a plausible counter-argument against the argument presented in the first paper. One might argue that since our choices have an effect on which people will come into existence one does not harm anyone

when eating unhealthily. That is because if one would eat healthily instead, a different child would be born because, perhaps, it would take more or less time to make a healthy meal instead of unhealthy, therefore the intercourse to happen would occur at a different time than it actually did when one ate unhealthily. But I am not convinced by this reasoning either. I think the morally relevant feature is when we eat unhealthily or do some other identity-affecting actions, that we harm *our child*. That is we harm whoever her or she will be.

The fourth paper of the thesis ***Liberal utilitarianism – yes, but for whom?*** continues the discussion on harming people who do not exist (and who never will). In the paper, I criticize Matti Häyry's liberal utilitarianism, a very plausible moral theory that I think still needs some revising. In the paper, I also show why I think applied ethicists do not need to worry too much about moral theories such as utilitarianism or deontology. I think, and my reasoning here is in line with David Boonin and Graham Oddie, that the more important tool for applied ethicists are thought experiments and specific argumentation methods that I explained in detail earlier in this introduction. Choosing one moral theory over the other, for instance, such as adopting Häyry's liberal utilitarianism rather than some rival moral theory does not solve practical issues such as the problem of ethics of abortion or prenatal injury.

The fifth paper ***Twin pregnancy, fetal reduction and the 'all or nothing problem'*** presents a puzzle. It continues the use of thought experiment on abortion and the moral status of the fetuses that I did in the previous paper. This paper, argues that there is a puzzle for those who generally accept abortion but who have difficulties accepting fetal reduction, that is an abortion that kills one of the twin fetuses but does not end the pregnancy altogether. This topical paper illustrates why many people think fetal reductions for social reasons are morally contested issues. For instance, recently in Sweden, a legal step towards prohibiting fetal reductions for social reasons was taking when IVO (Inspektionen för vård och omsorg, in English: Health and Social Care Inspectorat) ruled a medical doctor was allowed to refuse to perform a fetal reduction for the woman since there was not a medical reason present.

The sixth paper ***Schrödinger's fetus*** continues the discussion on the ethics of abortion. It asks, what if we would take the approach that those fetuses who die while being a fetus do not have moral status while those who survive had full moral status all along? This line of thinking could help us to combine some elements from pro-life and pro-choice positions.

The seventh paper ***Age and ageing: what do they mean?*** moves the focus from fetal life to human life and human ageing in general. It offers novel ways to think about our age and ageing. I argue that there are several, eventually, unsatisfactory accounts to age and ageing. Biological age, based

on our epigenetic marks is a plausible account of them. Chronological age, the time we have existed and been alive for is another. The third one is the experiential account. According to this account, our age depends on how much we have lived and experienced our life. I try combine all three accounts and form, what I named, a two-tier account to age and ageing. Yet, while it seems to solve some of the problems, I argue that not all problems can be adequately solved with it.

The eighth paper ***Moral case for legal age change*** takes one plausible concept of age and ageing: biological age, and argues that since in some cases it seems relevant account for age and ageing perhaps legal age change should be warranted to avoid discrimination because of old age.

In the ninth paper ***Further defence of legal age change: a reply to the critics***, and in the tenth paper ***Age change in healthcare settings: A reply to Lippert-Rasmussen and Petersen***, I defend the idea of the legal age change against several critics of mine. I conclude that while the idea of age change has been hit, it is not down.

Of course, much more could be said related to many (if not all) of the articles of this thesis. For instance, the idea of legal age change could be improved by considering arguments claiming that age change itself is ageist practice and therefore should be prohibited.[28] A useful discussion that could be applied in this context appeared in the *Journal of Medical Ethics* where scholars discussed so-called non-medical egg freezing, that is the practice of egg freezing for the sake of delaying parenthood.

Petersen (one of the critics of my *Moral case for legal age change*), carefully distinguishes between three variants of individualization arguments: the non-address view, the distraction view, and the further-oppression view (Petersen 2021)[29]. All of these could be deployed against the idea of age change as well. I am not sure whether the individualization arguments refute the practice of age change, or whether the arguments can be rejected, however I leave it to my future work to consider such arguments.

The papers appear in this thesis as they appeared in the journals with two small exceptions: the style of the reference and citations have been changed so that they are similar throughout the thesis. Some small typos and other minor errors have also been corrected for this thesis. Since the papers were not published or written in the same order as they appear in this thesis, the flow between the papers is not the same as it would be in a monograph. I believe the papers work as independent research

[28] I thank Anna Smajdor for the suggestion that age change would be ageist.
[29] See also Segers (2021), Campo-Engelstein and Moen (2021) on individualization arguments.

articles but that papers also form a coherent study on the ethics of epigenetics throughout the human lifespan.

While I truly hope my thesis is convincing, I am not sure if I have managed to convince my readers everywhere. Be that as it may, I hope my thesis presents clear and understandable claims, and forthright, forcefully expressed and interesting arguments that others would want to engage with.

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Against the impairment argument: a reply to Hendricks

Abstract

In an article of this journal [Bioethics], Perry Hendricks makes a novel argument for the immorality of abortion. According to his impairment argument, abortion is immoral because 1) it is wrong to impair a fetus to the nth degree, such as causing the fetus to have FAS (fetal alcohol syndrome), 2) it is wrong to impair a fetus to the n+1 degree (to cause the fetus to be more impaired than to have FAS), 3) killing the fetus impairs the fetus to the n+1 degree (causes it to be more impaired than to have FAS), 4) abortion kills the fetus, Therefore 5) abortion is immoral. The impairment argument is promising account for the wrongness of abortion because it does not rely on the controversial metaphysical premise that a fetus is a person. This response aims to show, that despite some immediate advantages over the rival theories of the immorality of abortion there is a reason to believe that impairment argument is untenable. That is because there are goods that can be achieved by abortion but that cannot be achieved by impairing the fetus.

Introduction

According to the impairment argument for (im)morality of abortion (Hendricks 2019), abortion is immoral because abortion impairs a fetus to the n+1 degree and that is wrong. That is wrong because it is also wrong to impair the fetus to the nth degree. For instance, it is wrong to cause a fetus to have FAS (fetal alcohol syndrome) by binge drinking while pregnant (impairing the fetus to nth degree). Because such action is wrong, it is wrong to kill the fetus via abortion because it impairs the fetus to the n+1 degree: it impairs the fetus even more than the FAS does.

So, for the immorality of abortion, it does not matter whether the fetus is a person or not (whether it has a right to life or not), or so claim Perry Hendricks, an advocate of the impairment argument. This response aims to show that there is reason to believe that the impairment argument is all things considered untenable and should be jettisoned.

The impairment argument

The impairment argument has been framed as follows:

(1) Causing an organism O to have FAS is immoral.

(2) If causing O to have FAS is immoral then, *ceteris paribus*, killing O is immoral.

(3) Therefore, killing O is immoral.

(4) If one aborts O, then she kills O.

(5) Therefore, to abort O is immoral.

First the good news. The argument is promising because it does not rely on the controversial metaphysical claim that we were once fetuses (Pruss 2011), or that every fetus has a full moral status similar to one reading or writing this paper (Kaczor 2015). It simply relies to a quite common assumption that if it is wrong to cause something bad to happen, it is even worse, morally, to cause something worse to happen.[35]

There are several ways one could contest the impairment argument. For example, Blackshaw (2019) argues that killing does not impair the fetus the same way as impairing does. Here, I will show that the ceteris paribus clause in the second premise of the argument is not met. Put another way: other things are not equal and by impairing the fetus the same goods cannot be achieved as by killing it.

To see the problem of the impairment principle, we can apply the argument to non-human animals as well. Many people believe it is wrong to impair animals. For example, it is wrong to blind a horse. If it is wrong to blind a horse, according to the argument, it is also wrong to kill a horse.[36] But horses are often killed, for example, for food. If the impairment argument works, not only is killing fetuses wrong but killing many non-human animals is also wrong.

Now, perhaps this should not be understood as a *reduction ad absurdum* against the argument because many people believe killing animals is wrong. But still, many pro-life scholars do not believe that is so. In fact, they often believe that there is something special about being a human and because animals are not human, we can treat them as we currently do. So those who already hold the pro-life position would not be persuaded by the impairment argument in the first place because they already believe that abortion is immoral, yet their arguments do not lead to the conclusion that killing animals is immoral – unlike the impairment principle.

Pro-lifers would, thus, rather keep their previous arguments that are based on the species membership or the substance-view (or some other view that assigns a special moral value for being a human, such as genetic bases for moral status, see Liao 2010) than accept the impairment

[35] Therefore, it also solves the Abortion paradox by claiming that there is no paradox because abortion is immoral. The kernel of the abortion paradox is based on the three plausible assumptions: i) abortion is permissible, ii) it is wrong to cause the fetus to be disabled, iii) it is better for the fetus to be disabled than dead. But how can morally wrong choice (causing the fetus to be disabled) be better than the permissible choice (killing the fetus)? For more about the paradox see McMahan (2005)

[36] Let's assume here that it is equally painless/painful for the horse to be blinded as it is to be killed.

argument, because then they can keep their belief that abortion is immoral, yet they do not have to change their belief on killing animals.

The advocate of the impairment argument could contest my claims and argue the *ceteris paribus clause* is not met in the case of an animal but that it is met in case of a fetus. Hendricks explains it as follows:

> If, for example, the impairment referred to in the consequent produces a particularly valuable good, but the impairment referred to in the antecedent does not produce such a good (or the good it produces is significantly less valuable), then the ceteris paribus clause is not met, and TIP [the impairment principle] does not kick in.

For instance, one could claim that there is a valuable good produced by killing the horse that is not produced by blinding it (by killing the horse we get the meat that can be eaten) and that there are no valuable goods that are achieved by killing the fetus that would not also be achieved by impairing it.

However, there are two problems with this reasoning. First, if one would eat the fetus after killing it, according to the argument, abortion would not be immoral because then there would be a good that would be achieved that were not possible to achieve if the fetus would be blinded (the meat of the fetus that could then be eaten). But surely, eating the fetus after killing it, does not make abortion less wrong, on the contrary. It seems to make it worse.

Second, some goods can be achieved by abortion but cannot be achieved by impairing the fetus, thus the impairment principle fails.

Goods of abortion

What goods are brought about by having an abortion that cannot be brought about by impairing the fetus by causing it to have FAS? Hendricks briefly considered some possible goods, and find them lacking. These are the good of the woman's autonomy, good of not having to be an unwilling parent and good of not having a child.

I believe the most obvious good that comes from abortion is that the child that would otherwise exist does not exist. Some might be sceptical whether there is anything good about 'non-existing'. However, several goods comes from non-existing. Non-existence is good for 1) the non-existing itself, 2) prospective parents and 3) for others; including animals, environment and fellow humans.

First, non-existence is good for the one who does not exist because she would avoid the pains she had otherwise inevitably suffered in life if existed (Benatar 2006). Abortion prevents someone from

coming into existence (or kills someone, depending on when a person become to exist) and that someone would inevitably suffer in life. When a woman has an abortion, she prevents the pains and discomforts of life befalling on the fetus (or the future person). Of course, one prevents also the pleasures and happiness of life the fetus (or the future person) would have experienced if not aborted, but that is not relevant here. What is relevant is this: the lack of pain and discomfort of the future person cannot be achieved by impairing the fetus.

Hendrick's did not claim that the bad should outweigh the good for the ceteris paribus clause to kick in, he simply claimed that it is enough to refute the argument that some goods cannot be achieved by impairment which could be achieved by the death of the fetus.

Second, the death of the fetus is good for the prospective parents because they would avoid the burdens of parenthood. Such as waking up at night to feed the child and so on. These cannot be achieved by impairing the fetus, for example, by giving it FAS. Again, surely there are goods of having a child that cannot be achieved by not having one and in at least some cases (perhaps even in the most) the goods of being a parent outweigh the goods of not being a parent. But again, the point is not to compare the outcomes of being and not-being a parent, but simply to show that there are goods that can only be achieved by killing the fetus – not by impairing it.

One could object here that the goods of not having a child can be achieved by adoption so abortion is not necessary. Hendricks suggests this. While it is true that some of the goods of not having a child can be achieved by adoption (such as not having to wake up at night to feed her), not all goods of not having a child can be achieved by adoption.

For example, in some rare cases, the genetic parents may well be required, morally, to do something demanding and harmful for themselves because of the wellbeing of the child. To understand this consider the case raised by Jeff McMahan.

> Sperm Donor. A man donates sperm at a sperm bank, having signed an agreement that both guarantees him anonymity and absolves him of all responsibility for any child who might be conceived using his sperm. Later, however, a woman who has been artificially inseminated using the man's sperm gives birth to a child with a serious medical condition. Only a bone marrow transplant can save its life. Desperate to find a suitable donor, the woman illegally obtains access to the records at the bank, discovers the identity of the sperm donor, and approaches him with a plea to donate bone marrow in order to save her child's life.(McMahan 2002: 226)

According to McMahan, many people believe, intuitively, that this biological relation gives the sperm donor a special reason to provide bone marrow for the child, although it might not mean that the sperm donor is obligated to provide the bone marrow. It is only to say that he has a moral reason to provide it that someone completely unrelated to the child does not have. While the sperm donor might not have a moral obligation to donate the bone marrow, I believe it is safe to assume that he is at least obligated to give serious thought on this and consider whether do donate the bone marrow or not. This moral reason to consider the donation does not disappear even though the child was adopted out. But it disappears when the child is killed while being a fetus. Therefore, there is a good of not having a child that can only be achieved by an abortion, so the impairment argument fails.

One might object and say that in the above case there is nothing that harms the parents. There simply is a risk of harm, because it is not sure that the adopted child ever need bone marrow, and that is a very different thing than actual harm. But is that so? If a dentist tells me that one of my teeth has suffered internal resorption, that slowly destroys the teeth from inside, and that every week there is a 10 % chance that I will suffer terrible pain and discomfort, I would not be satisfied to hear that it is just a *risk* of pain and suffering and perhaps I never experience any pain related to the tooth. I would not be satisfied because the risk itself causes, when I am aware of it at least, harm to me since I could not enjoy my life normally. Similarly, someone adopting a child might be harmed (for instance psychologically) because she might constantly be aware that the child could someday find her and ask for, for instance, a bone marrow transplant.

Last, but not least, having yet another human in the planet would be bad for the environment, other humans and non-human animals because of consuming natural resources and straining our planet (Conly 2015). The harm to others every human does is something that can be reduced by abortion but not by impairing the fetus. Therefore, the impairment argument fails.

Conclusion

I have argued here that the impairment principle, while initially promising cannot show that abortion is wrong. That is because there are goods that can be achieved by killing the fetus but which cannot be achieved by impairing the fetus. Thus, the second premise of the impairment argument: 'If causing O to have FAS is immoral then, ceteris paribus, killing O is immoral (from TIP)' is false because other things are not equal. Therefore, I think, we can add the impairment principle to the list of pro-life arguments that are not convincing (see Räsänen 2016; 2018).

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Liberal utilitarianism – yes, but for whom?

Abstract

The aim of this commentary is to critically examine Matti Häyry's article 'Just Better Utilitarianism', where he argues that liberal utilitarianism can offer a basis for moral and political choices in bioethics and thus could be helpful in decision-making. This commentary, while generally sympathetic to Häyry's perspective, argues that Häyry should expand on who belongs to our moral community because, to solve practical ethical issues, we need to determine who (and what) deserves our moral consideration. Challenging Häyry's principle of actual or prospective existence, this commentary suggests that – at least sometimes – the quality of life of those who will never come into existence matters. In a similar vein, this commentary aims to show that determining how to treat mindless humans such as fetuses might pose difficulties for liberal utilitarianism unless the issue of the boundaries of the moral community is addressed.

Introduction

In his important paper "Just Better Utilitarianism," Matti Häyry (2021) reminds his readers that liberal utilitarianism can offer a basis for moral and political choices in bioethics and thus could be helpful in decision making. While I agree with the general defense of Häyry's liberal utilitarianism, in this commentary I urge Häyry to say more on who belongs to our moral community. I challenge Häyry's principle of actual or prospective existence. I also argue that Häyry should say more on human beings at the "margin of life" (such as fetuses and other mindless humans). I claim that debate over whether some form of utilitarianism is superior over other moral theories is not as important as answering the question underlying these issues: Who belongs to our moral community?

Challenging the principle of actual and prospective existence

Häyry's liberal utilitarianism includes the following principle:

> "When the moral rightness of human activities is assessed, the imagined needs of non-existent beings who will never come into existence shall not be counted. "

Call this *the principle of actual or prospective existence*. Häyry adopts this rule to avoid the repugnant conclusion that we must reproduce every time we could have offspring with tolerable lives. This principle is in line with Häyry's antinatalist view: not having children is both rational and ethical (Häyry 2004; 2005). Some see this sort of antinatalist conclusion as repugnant or

implausible itself (Pihlström 2009), while others endorse similar conclusions for somewhat different reasons (Benatar 2008; Rachels 2014).

I am not sure whether it is wrong to have children. That is because I am not fully confident that existence is always bad. However, I am confident that nonexistence cannot be bad, so it cannot be wrong *not* to have children. Thus, abstaining from procreation seems to be the safe option, morally, because you cannot wrong someone who does not exist. Be that as it may, I think we have a reason to reject the principle of actual or prospective existence or, at least, to revise it.

To see this, consider the following case:

> A couple wants to have a child. If they procreate now, their child will be sick. She will suffer pain and discomfort through her life. However, if the couple waits a month, they will have a healthy child whose life is much better – overall – than the life of the child who would be conceived earlier.[52]

Assuming that the child would be a different child because of different DNA and that the couple has no reason not to wait a month, it seems that they *should* wait a month. It is better, morally, to have a child whose life is better than one whose life is worse, other things being equal. Based on some of Häyry's previous work (2004), I assume he agrees.

However, if the principle of actual or prospective existence is correct, it might be difficult to claim that the couple should wait and have the child whose life would be better instead of proceeding immediately to have the child whose life would be worse. After all, if they choose not to wait a month and have the sick child instead, the other child would never come into existence. If the other child never comes into existence, then according to the principle, her imagined needs are not to be counted. And if her imagined needs are not counted, it is not obvious why the couple should have waited a month and created the better off-child rather than the worse-off child.

So, to avoid this problem, it could be, that the imagined needs of people that never come into existence matter, at least sometimes. More precisely, they matter when one has decided to bring a person into existence.

One might wonder what sort of moral obligations the couple have if they cannot have the healthier child at all. For example, suppose that no matter what they do, any child they have will spend her life in pain. Technically, a child they conceived at a later time would be a different person from one

[52] Derek Parfit famously raised this kind of example in Parfit (1984).

they conceived at an earlier time, because postponing the act of procreation would cause different gametes to unite. Would it be wrong for the couple to procreate?

I think many people would agree that if the life of the child is worth living, the couple does nothing morally wrong in bringing her into existence. And many would say that even if they also agreed that a couple that *could* bring a healthy child into existence but intentionally chooses to have a sick child instead does do something wrong.

As I see it, Häyry has three options here. He could reject the principle of actual or prospective existence. But that would, it seems, lead to the repugnant conclusion that we should reproduce every time we could have offspring with tolerable lives. Another choice is to simply bite the bullet and accept that it is not morally wrong to create a life that is worse than some other life you could create instead. But this would contradict Häyry's previous claims.[53] The third option, which I think is the most plausible one, is to revise the principle of actual and prospective existence so that it is not vulnerable to the counter-example raised above.

Here is one friendly suggestion for how to do that, which I call *the revised principle of actual or prospective existence*:

> When the moral rightness of human activities is assessed, the imagined needs of nonexistent beings who will never come into existence shall not be counted unless one has already made the decision to bring a person into existence. If one has decided to procreate, the imagined needs of nonexistent beings should be counted and one therefore has a moral reason to bring the best-off person one can into existence.

So if the quality of life of those people who never exist does not matter when one has not decided whether to bring any persons into existence, but only when one has decided to bring a person into existence, the principle does not create an obligation to procreate every time one could do so. This would be in line with what Häyry and others (Savulescu 2008) have argued or assumed to be true.[54]

[53] Häyry could also say that there has been philosophical progress in his view and that he no longer thinks one should create the best possible lives if one is going to procreate. Or he could claim that he does not actually believe (some of) his arguments. At least one scholar (Plakias 2019) has claimed that a philosopher does not have to believe what she herself is arguing for.

[54] Also, for example, Peter Singer says: "To focus only on those who exist or will exist anyway leaves out something vital to the ethics of this decision [which lives to create]. We can, and we should, compare the lives of those who will exist with the lives of those who might have existed, if we had acted differently. …We can and should 'argue as if from the abyss of the non-existent.' Never having tasted 'life's desire,' they will 'feel no dearth' of life. Yet the quality of the lives they would have led is inescapably relevant to our decision." Singer (2011: 110–111).

Do actual but mindless humans deserve our moral consideration?

How we treat mindless humans could also pose a problem for liberal utilitarianism. By *mindless humans*, I mean beings that are biologically human (that have human DNA) but that are not conscious, such as (at least early) fetuses and brain-dead humans. For simplicity, here my discussion is focused on fetuses.

Häyry does not discuss the ethics of abortion or the moral status of the fetuses in his paper, but he mentions Alberto Giubilini and Francesca Minerva's (2013) now-famous article on the moral permissibility of infanticide.[55] Häyry (2015) approaches that article at a more abstract level: his reaction to it was to demand clarity in bioethical arguments and to discuss the possibility of anonymous publishing (Häyry 2014).

I assume Häyry's position on ethics of abortion has not changed significantly since he started his career in philosophical bioethics. Then, Häyry summarized his view as follows: abortion is morally permissible and should be legally permitted as long as the woman makes the decision while being aware of the consequences of her decision to herself and the fetus (Häyry & Häyry 1987).

Pro-choice views on the ethics of abortion can, roughly, be based on two kind of arguments: (i) person-denying arguments and (ii) bodily-autonomy arguments. Thus, if abortion is not morally wrong, that is so because either (i) a fetus is not a person and does not have a right to life, which means that a fetus is a sort of being whose life is not wrong to end, or (ii) the pregnant woman has a right to her bodily autonomy, which means that, even if the fetus *has* a right to life or *is* a person, the fetus does not have a right to use another person's body to sustain its life and, therefore, abortion is morally justified.

In "Just Better Utilitarianism," Häyry posits his liberal utilitarianism in light of Jeremy Bentham's words: "The question is not, Can they *reason*? nor, Can they *talk*? but, Can they *suffer*?"(Bentham 1982: 283) Häyry uses this reasoning on nonhuman animals. According to liberal utilitarianism, meat consumption, factory farming and other related practices are immoral because animals can, indeed, suffer.[56] Their interest in not suffering is more basic than our need (or desire, to say it more accurately) to consume animal-based products, such as meat. Because it is wrong to satisfy less basic needs of one being by preventing the possibility of satisfying more basic needs of others, meat consumption and the other practices are morally wrong.

[55] For other arguments that infanticide is (in some cases) morally permissible, see Kuhse & Singer (1983); Hassoun & Kriegel 2008; Räsänen (2016). For criticism, see Kaczor (2020).
[56] A famous utilitarian argument for animal rights was made in Singer (1975).

Now, if mindless humans such as fetuses can suffer (i.e. feel pain), could that undermine the notion that liberal utilitarianism justifies abortion? One might think so, because if abortion is permissible, then the more basic needs of the fetuses (avoiding suffering) would be ignored in favor of the less basic needs of pregnant women (controlling what happens to one's body).

Studies often suggest that a cortex and intact thalamocortical tracts are necessary to experience pain. Since the cortex only becomes functional and the tracts only develop after 24 weeks, many studies hold that a fetus cannot experience pain until the final trimester. But in recent work it has been argued that neuroscience cannot definitively rule out fetal pain before 24 weeks (Derbyshire & Bockmann 2020). Although most abortions occur well before 24 weeks, some of the United States allow abortion even during the final trimester.[57]

Suppose fetuses do feel pain. It seems that liberal utilitarians should at least be concerned about it. They could not simply ignore fetal pain.

In a landmark paper Judith Jarvis Thomson argued that abortion is still morally permissible even on the assumption that fetuses have a right to life and are persons. To support her position, she offered the following hypothetical case.

> *Famous Violinist.* You wake up and find yourself in a bed, attached to an unconscious famous violinist. He has been found to have a fatal kidney ailment, and the Society of Music Lovers has attached him to you because you alone have the right blood type to help. A doctor tells you: "We're sorry you have been connected to this person. We would have never allowed it if we had known. But to unplug him now would kill him. Nevertheless, it's only for nine months; after that, he will recover from his ailment and can safely be unplugged from you." (Adapted from Thomson 1971)

Thomson's reaction to the case was that although it would be very nice for you to remain attached, it is not your moral obligation. It is morally permissible for you to detach yourself from the violinist because, although he has a right to life, he does not have a right to use your body to sustain his own life. Because the case is, allegedly, analogous enough with pregnancy, the pregnant woman likewise has a right to detach the fetus from her, even in the cases where the fetus would die as a result.[58]

[57] For instance, while the landmark decision in the US (*Roe v. Wade*) prohibited states from banning abortion in the first trimester, the states are free to allow abortion during the second and third trimesters as well.

[58] There are disagreements on whether her argument manages to justify abortion. For a recent criticism, see for example Bernstein & Manata (2019).

To see what moral weight fetal pain, if it exists, would have, we can revise Thomson's case so that detaching yourself from the violinist is very painful to him. Consider the following revised case.

> *Painful Detachment.* You wake up and find yourself in a bed attached to an unconscious famous violinist. He has been found to have a fatal kidney ailment, and the Society of Music Lovers has attached him to you because you alone have the right blood type to help. A doctor tells you: "We're sorry you have been connected to this person. We would never have allowed it if we had known. But to unplug him now would kill him *very painfully*. Nevertheless, it is only for nine months; after that, he will cover from his ailment and can safely be unplugged from you."

Does the pain detaching yourself would cause make you morally obligated to remain attached to the violinist? Probably not. Does it give you a moral reason to consider whether you can do something to ease the pain? Probably yes. If it is possible, the violinist should be offered pain relief, if pain, as a liberal utilitarian must assume, has any moral relevance. Similarly, we should be concerned about fetal pain.

But now, what if we could ease the pain of animals in factory farming? If, given that fetuses do feel pain, we are only obligated to ensure that abortion does not cause the fetus to feel pain, not to prevent abortions per se, why we should stop killing animals? Isn't enough that we make sure they are killed painlessly? If on the other hand, we believe that we should not kill animals for food even if we can do so without inflicting pain, why we should not abstain from killing fetuses as well?

A liberal utilitarian might have at least two replies. She might say that *killing animals is unnecessary* because the same goods can be achieved by other means, such as by eating plant-based food. However, there are no proper alternatives to abortion: the same goods that are achieved by abortion cannot be achieved by, for example, gestating the fetus to the term and giving it up for adoption.[59] One might also say that pregnancies happen inside women's bodies while killing animals does not, and that this is morally relevant.

But now suppose we imagine that, thanks to new technology, it is no longer necessary to kill the fetus when ending the pregnancy prematurely. Perhaps sometimes, pregnancy does *not* happen inside a female body in the first place.[60] Consider the following cases.

[59] For goods of abortion, see Räsänen (2020).
[60] Artificial womb devices (re)raises other interesting ethical issues beyond abortion debate. For recent ethical issues on ectogenesis, see Räsänen & Smajdor (2020).

> *Partial ectogenesis.* It has become possible to detach a fetus from the female body in a very early phase of pregnancy and gestate the fetus inside an artificial womb instead. A woman gets pregnant and wants to have an abortion, but the doctor tells her: "You know, you don't need to kill the fetus. We can just remove it alive and gestate it in an artificial womb machine. Then, after a few months, you could give it up for adoption if you still feel you don't want to have a child."

Is the woman still entitled to have the fetus killed, or is she morally obligated *not* to kill the fetus? Surely, people's intuitions differ here, but I suspect—and some studies suggest (Cannold 1995)—that at least many women would feel that avoiding the burdens of the pregnancy is not the point of abortion: the point of abortion is not to have a child at all (Langford 2008; Mackenzie 1992; Overall 2015).

To propose partial ectogenesis as an alternative to abortion would thus be to misunderstand the purpose of abortion. Since the *purpose* of the abortion is to have the fetus killed, but the *justification* for the abortion is bodily autonomy and integrity, when an artificial womb device becomes an option, another justification for abortion will be needed. That brings us to the next case.

> *Complete ectogenesis.* It has become possible to create embryos in vitro and gestate them in artificial womb machines. A couple wants to have a child, but after the embryos are created and transferred into the machine, they change their mind. They do not want to have a child. However, the doctor tells them: "You know, you don't need to destroy the embryo developing in the machine. You can just leave it there, and when the time comes, if you do not want the newborn, we can give it to some other couple that does want to have a child."

Is the couple – either together or separately – still entitled to have the embryo destroyed, or are they morally obligated *not* to destroy it? (see Räsänen 2017; Hendrciks 2018; Kaczor 2018; Blackshaw & Rodger 2019). Again, our intuitions probably differ. But what seems to be relevant is whether the fetus itself is the sort of being whose life it is seriously morally wrong to end. So, it is likely that to determine what the couple or the woman should do, morally, in the above cases cannot be answered without answering the question of whether the fetus itself is entitled to a right to life. Häyry could just assume that embryos or fetuses are not the sort of beings (persons) whose life it is seriously morally wrong to end. But this simply assumes an answer to the very difficult question that, to my mind, should be answered first.

It is very easy to be a utilitarian when faced with simple scenarios. It is also easy to become a utilitarian in time of crisis: for instance, public health often uses a utilitarian approach to make triage

decisions during pandemics (Childress 2002) such as COVID-19. For an example of a simple case, consider the following.

A billionaire who is convinced by liberal utilitarianism donates one million dollars to the state on the condition that the money be spent to save as many of his fellow citizens' lives as possible. The state has two choices: use the money for one ambulance helicopter that patrols a rural part of the country, or use the money for ten ambulances that are used in major cities. The helicopter would save, on average, one life annually while the ambulances would save, on average, one hundred lives annually.

It is obvious what to choose. Other things being equal, the money should be spent for the ambulances, so that the greatest number of people would be saved.

But now suppose there is a third possibility. Use the money to fund a campaign to discourage women from choosing abortion. Suppose further that this money would save 1,000 embryos and fetuses from being aborted. Should the state choose this policy instead because it saves even more lives? It depends. It depends on whether we count fetuses and embryos as part of our moral community. If we do, then it seems to be a moral obligation to choose the campaign, but if we do not consider these mindless humans a part of our moral community, then there is no moral obligation to choose this option over the ambulances.[61]

There are also recent real-life cases that illustrate the problem. For instance, there is an ongoing debate whether guidelines for treating extremely premature babies should be altered to free up ventilators for adults during the COVID-19 pandemic (see Haward et al. 2020). In some cases, a ventilator would give an adult a higher probability of survival than it would give the extremely premature baby who would otherwise get it. However, saving babies rather than adults would likely maximize life years saved, since a baby who survives is likely to live longer than an adult who does. It is difficult to apply any utilitarian approach successfully if we do not know what moral status to assign to the mindless human fetuses (see Räsänen 2020).

We could simply say that fetuses are not persons because they lack (self-) consciousness. But we could say many nonhuman animals lack that as well. Or someone could reply that being a person does not matter: what matters is that when killing a fetus (or embryo) we are depriving it of life

[61] In abortion ethics literature, there is a vast amount of work on similar thought experiment (embryo rescue case) that aims to show that embryos are not persons. See Liao (2006); Räsänen (2018; Hendricks (2019); Hershenov (2020).

unjustly (Marquis 1989). Isn't life itself a very basic need that outweighs any alleged needs or wants to control one's body?

It is very easy to be a utilitarian when it is clear who belongs to our moral community. But it is much more difficult to apply utilitarian approaches to practical issues when there is a reasonable disagreement as to whether someone (or something) is a sort of being we should be morally concerned about. Consider (illegal) immigrants, recipients of international aid, fetuses and embryos, the brain-dead, the severely mentally disabled, non-human animals and so on.[62]

How societies should treat the aforementioned is not obvious because it is not obvious whether they belong to our moral community. I am afraid that liberal utilitarianism cannot tell us how we should treat them unless we somehow determine whether they are the sort of beings we should be morally concerned about.

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[62] Häyry briefly discusses some of the mentioned entities in Häyry (2020).

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Twin pregnancy, fetal reduction and the 'all or nothing problem'

Abstract

Fetal reduction is the practice of reducing the number of fetuses in a multiple pregnancy, such as quadruplets, to a twin or singleton pregnancy. Use of assisted reproductive technologies increases the likelihood of multiple pregnancies, and many fetal reductions are done after in-vitro fertilization and embryo transfer, either because of social or health-related reasons. In this paper, I apply Joe Horton's all or nothing problem to the ethics of fetal reduction in the case of a twin pregnancy. I argue that in the case of a twin pregnancy, there are two intuitively plausible claims: (1) abortion is morally permissible, and (2) it is morally wrong to abort just one of the fetuses. But since we should choose morally permissible acts rather than impermissible ones, the two claims lead to another, highly implausible claim: the woman ought to abort both fetuses rather than only one. Yet, this does not seem right. A plausible moral theory cannot advocate such a pro-death view. Or can it? I suggest ways to solve this problem and draw implications for each solution.

Introducing the problem

Fetal reduction is the practice of reducing the number of fetuses in a multiple pregnancy—say, quadruplets—to a twin or singleton pregnancy. Use of assisted reproductive technologies like in-vitro fertilization and embryo transfer have increased multiple pregnancies (Evans et al. 2005). That is because in IVF, the usual practice is to transfer two or more embryos to achieve pregnancy but it also results in a high incidence of multiple pregnancies (Hazekamp et al. 2000). In some of these pregnancies, fetal reduction is deemed necessary for social or health-related reasons.

Technically, fetal reduction is different from abortion since it ends the lives of some of the fetuses but it does not end the pregnancy. It is also opposite from a much-discussed future technology where an early pregnancy could be ended without ending the life of the fetus (Romanis 2018; Räsänen 2017; Kaczor 2018; Stratman forthcoming; Romanis & Horn 2020). However, it has been argued that the practices of abortion and fetal reduction are so closely related that their ethical bearings should not be analysed in strict isolation from each other (Rao 2015).

While reduction of multiple pregnancies to twin or singleton pregnancies is an established and widely acceptable option (Evans et al. 1996), reduction of twin pregnancy to singleton has been comparatively rare. However, reducing twin pregnancy to singleton has become more common in

recent years (Evans et al. 2004), and is sometimes done for social reasons (De Catte & Foulon 2002) rather than health.[63] According to an article published by *The New York Times* in 2011, the Mount Sinai Medical Center in New York—one of the largest providers of the procedure in the US—reported that while only 15% of fetal reductions in 1997 were to a singleton, by 2010 that figure had risen to 60% (61 out of 101 cases), of which 66% (38 cases) had started as twins (Padawer 2011).

The increasing numbers of twin reductions have made some doctors feel uneasy, and many who perform pregnancy reductions refuse to go below twins. In a more recent article, published by the *National Post* in 2016, it was reported that a doctor at the Mount Sinai Medical Center refused, on moral grounds, to reduce a woman's twin pregnancy to a singleton. The hospital declined to provide the service, saying its current practice was to only reduce triplets or more unless one of the twins had some kind of anomaly (Blackwell 2019).

My aim in this paper is to shed light on why twin reduction is a morally contested issue. I do this by applying Joe Horton's *all or nothing problem* to the ethics of fetal reduction (which is one instant of a more general problem). I suggest possible solutions to the problem and draw out some implications of the solutions.

First, consider the following case by Horton, illustrating the problem:

> Suppose that two children are about to be crushed by a collapsing building. You have three options: do nothing, save one child by allowing your arms to be crushed, or save both children by allowing your arms to be crushed. (Horton 2017)

It seems plausible that it is permissible for you to do nothing. It also seems plausible that saving only one child is wrong. Now suppose you are not going to save both children. The two claims seem to imply a third claim: that you ought to save neither child rather than save only one. But this simply does not seem right. This is the *all or nothing problem.*

To apply the problem with the ethics of abortion, consider the following:

> A woman is pregnant with healthy twins. She has three choices:

(1) Gestate both fetuses and give birth to them.

[63] There are no comprehensive statistics on the reasons behind fetal reductions. Arguably, most are done because of the health of the fetuses or the mother. However, it seems that many are done because of non-medical reasons. In one study (de Catte & Foulon 2002), fetal reduction to singleton pregnancies was performed in 80 multiple gestations; 17 were because of congenital malformations, 25 because of high-risk obstetric conditions and 38 because of social/psychological reasons.

(2) Undergo fetal reduction, killing one of the fetuses; then gestate and give birth to the remaining fetus.
(3) Have an abortion, killing both fetuses.

Here, too, as in Horton's original case, we have two intuitively very plausible claims:

> **Abortion is permissible**. It is morally permissible for the woman to have an abortion and kill both fetuses.
>
> **Killing only one of the fetuses is wrong**. It is morally wrong for the woman to have a fetal reduction that kills just one of the fetuses.

Abortion is permissible is a plausible claim because of the sacrifice of remaining pregnant and giving birth to a child. It would be a heroic act for her to let another person use her body for nine months but allegedly, she is not obligated to do so. People (whether fetuses or not) simply do not have a right to use another person's body to sustain their own life (Thomson 1971).

Killing only one of the fetuses is wrong is a plausible claim on the assumption that carrying both fetuses to term does not require a (much) greater sacrifice than doing so for just one. This assumption is, of course, controversial, and I will consider it in detail later on in this paper; but for the sake of introducing the problem, let us assume it is true.

If a woman pregnant with twins could realistically carry both fetuses to term without significant additional burden or risks to herself, then surely it would be wrong for her to kill just one of the fetuses. After all, she has already decided that she is willing to suffer the risks and burdens of pregnancy. At least, this is what I assume many people initially believe.

But there seems to be a problem with accepting both of these claims. Suppose the woman wants one child, but no more. The claims *Abortion is permissible* and *Killing only one fetus is wrong* seem to imply a third claim: The woman ought to abort both fetuses rather than only one. This is because if killing two is considered permissible, but killing one is impermissible, and we should always do something permissible rather than something impermissible, then it follows that the woman ought to abort both fetuses rather than only one. But this just does not seem right.

The third claim thus seems very counterintuitive. Surely, the best moral view would not discourage the woman from motherhood altogether, and any plausible moral theory simply should not recommend such a pro-death view where the woman should (morally) take two lives instead of one.

Solutions to the problem

So far I have introduced Horton's *all or nothing problem* and applied it with the ethics of abortion. Now, I will consider possible ways to solve the problem.

Three initial solutions present themselves, namely:

1. Rejecting the first claim: *Abortion is permissible.*
2. Rejecting the second claim: *Killing only one fetus is wrong.*
3. Rejecting the assumption that gestating and giving birth to twins presents a comparable risk and burden as gestating and giving birth to a singleton.[64]

So, let us consider each solution and draw out some implications for each of them.

Rejecting the first claim

One could say that there is a natural solution to the paradox: accepting the pro-life view. Many authors have defended the pro-life view (Marquis 1989; Beckwith 2007; Lee & George 2008; Kaczor 2015). This solution rejects the first claim: *Abortion is permissible.* A proponent of this solution could claim that it is wrong to kill fetuses in general; that it is wrong to kill just one of them, but even worse to kill two. A woman who is pregnant with twins has only one morally tenable option: to gestate both fetuses and give birth to them. Having an abortion or selective reduction would both be wrong because of the wrongness of killing.

While this solution seems natural to those who hold the pro-life view, others would not be persuaded. For many, it is simply too demanding. Surely, it would be a heroic act, a great kindness, to let the fetuses use her body to sustain their own life, but it is not anyone's moral obligation. Thus, while rejecting the first claim is a solution some might accept, it does not solve the paradox for us all.

Rejecting the second claim

Another way to solve the paradox is to reject the second claim: *Killing only one fetus is wrong.* A proponent of this solution could claim that it is not wrong to kill only one of the fetuses.

[64] The third solution is really a developed version of the second solution. I thank an anonymous referee at the *Journal of Medical Ethics* and Aksel Braanen Sterri for urging me to make this explicit.

A possible way to justify this solution is to claim that a woman has a right to decide what happens in and to her body. Thus, she has a right to decide how many and which of the fetuses, if any, she carries to term.

We can illustrate this with an analogy (adapted from Judith Thomson 1971).

> *Famous Violinist.* You wake up and find yourself in a bed, attached to an unconscious famous violinist. He has been found to have a fatal kidney ailment, and the Society of Music Lovers has attached him to you because you alone have the right blood type to help. A doctor tells you: "We're sorry you have been connected to this person. We would have never allowed it if we had known. But to unplug him now would kill him. Nevertheless, it's only for nine months; after that, he will recover from his ailment and can safely be unplugged from you."

Many, including Thomson, think that although the person has a right to life, he does not have a right to use your body to sustain his own life and it is morally permissible for you to detach yourself from the violinist (for example, Manninen 2010). By parity of reasoning, abortion is permissible as well.

While this is not an implausible view, it has implications. Here is one: suppose a woman is pregnant with twins, one male and one female. Suppose the woman has cultural, social, and economic bias in favour of male children, so she wants to end the life of the female fetus. Discussion on sex-selective abortion is broad (Rogers et al. 2007; Sterri 2020), and I am not going into details here. Yet, many people, including feminist scholars (Gupta 2014), find it morally objectionable (or at least morally disturbing) to terminate the life of the fetus in this case, at least if both fetuses could be gestated with roughly the same cost and burdens to the mother.

The following illustrate the issue nicely. Suppose in the *Famous Violinist*, you decide to stay attached to the violinist to save his life (surely, this would be a great kindness on your behalf, but not your moral obligation). Now suppose there is another violinist attached to you whom you could save at a marginal extra cost, then, it seems, you have an obligation to save the other one as well.

Someone might claim you always have a right to decide whether you will save one, two or no lives. But, the problem with this claim is that being forced to accept the counter-intuitive result does nothing to dissolve the very real moral quandary that many people will likely feel when they themselves are faced with the problem. A satisfying solution would not just ask us to accept a seemingly unacceptable conclusion, but to explain, in a way that would change our initial intuitions, why the conclusion is not as wrong as it initially seems. It might be possible to do that, especially

if one could successfully refute the assumption that gestating two fetuses is (roughly) as risky and/or burdensome as gestating just one fetus. Next, we will consider if that is possible.

Rejecting the assumption that gestating two fetuses is as risky as gestating just one

The third solution to the problem develops the second solution and rejects the assumption that carrying two fetuses to term is (roughly) as risky as carrying one fetus to term. This line of response would argue that twin pregnancies are significantly riskier to the pregnant female than singleton pregnancies; and that, because of this, the woman is morally entitled to reduce the number of fetuses to a safe and comfortable number. Therefore, it would not be wrong to kill just one of the fetuses in a twin pregnancy.

This response has some merit. Many studies have shown that gestating several fetuses simultaneously carries a significant risk for the female and the fetuses alike. Multiple pregnancy is associated with a high risk of several problems, including spontaneous abortion, hypertensive disorders, placenta previa, and fetal malformations. Because of the high risk of pregnancy complications, a set of ethical guidelines developed and published in 1988 argued that reducing pregnancies with more than three fetuses to two or three was justified from a medical perspective (Evans et al. 1988). However, it is not immediately obvious that *twin* pregnancies are much riskier than single pregnancies, because many studies evaluating the risks of multiple pregnancies evaluate the risk of pregnancies with *more* than two fetuses.

So, what are the risks of twin pregnancies? Arguably, a twin pregnancy comes with risks, both for the woman and the fetuses. Some of these risks can even be life-threatening.

In one study, the risks of a twin pregnancy are reported as being more than double those of a singleton (Hasson et al. 2010). In another, participants were asked whether they experienced nausea and vomiting during pregnancy prior to 12 gestational weeks. Women with twin pregnancies had higher odds of experiencing nausea and vomiting (both moderate and severe) during pregnancy compared to women with singleton pregnancies (Mitsuda et al. 2019). Another study found that rates for both gestational hypertension and pre-eclampsia are significantly higher among women with twin pregnancies than among those with singletons (Sibaiet et al. 2000).

These findings seem to show that we should reject the assumption that gestating two fetuses is (roughly) as risky as gestating one fetus. But while this assumption should be rejected, it is not enough to solve the problem. What is relevant here is whether reducing the number of pregnancies from twin to singleton *reduces* the risk of pregnancy complications; not whether the twin

pregnancies *are* riskier than single pregnancies. To solve the problem, we need to reject the following claim.

> Reducing the number of fetuses from two to one does not significantly reduce the risk of obstetric complications and/or bodily burdens.

If this claim is true, then the problem persists. So, can we reject it? Some studies do show that reducing twin pregnancy to singleton decreases the risk of complications. In one study, patients who elected to reduce to a singleton pregnancy had a higher gestational age of delivery as well as lower rates of preterm birth and pregnancy complications, all without an increased risk of pregnancy loss (Vieira et al. 2019). Another study reports that in patients starting with twins, reducing from twins to a singleton seems to significantly lower risks and improve outcomes.[9] Some ethicists have indeed concluded that empirical evidence appears to resolve the moral debate over twin reduction (McClimans 2015).

However, some studies report different findings. One recent study says that while fetal reduction of a twin pregnancy significantly improves neonatal birth weight, it does so with an increased risk of pregnancy loss (van de Mheen et al. 2015). Another study did not demonstrate any advantage of selectively reducing a twin pregnancy to a singleton. Total pregnancy complications, preterm delivery, mean birth weight, and cesarean section rates were all similar between reduced twins and non-reduced twins, in both cases significantly worse than singleton outcomes.[24] Another recent study show that fetal reduction from twins to singleton reduces the risk of preterm birth, but not for more severe maternal and perinatal complications (Greenberg 2020). Yet another study reports that fetal reduction of twin pregnancies decreases the risk of late preterm birth but not the risks of more severe complications, such as early preterm birth (Grupta et al. 2015). Some scholars have even claimed that because of the pregnancy loss risk in twin reduction and the relatively good outcome of twin gestations, reduction of twins to singletons is ethically acceptable only in extraordinary maternal or fetal conditions (Drugan & Weissman 2016).

It seems that the evidence is inconclusive. Based on the recent studies on fetal reduction of a twin pregnancy, we cannot reject the claim that reducing the number of fetuses from two to one does not significantly reduce pregnancy-related risks, complications, or physical burdens, or some combination thereof. As long as the evidence remains inconclusive, it seems that this line of response cannot successfully solve the problem.

Two objections and the replies

One might object here by claiming that pregnancy is so intimate experience (Little 1999) – perhaps even transformative experience (Woollard 2021) – that pregnant people are themselves in the best position to evaluate what it requires to carry and sustain a pregnancy. As Maggie Little frames it: "[A]bortion should be unrestricted, not because the embryo and early fetus have no value, but because pregnancy asks an enormous amount of a woman, and she is in the best position to judge whether it is a price that can be paid" (Little 2008: 333).

Because of this, the decision to terminate any number of pregnancies belongs to the pregnant person and no-one else.[65]

I am not denying that it is the pregnant person who has the legal right to decide what fetuses and how many she will gestate – if any. I am simply arguing that there is a moral problem: gestating only one fetus and terminating the life of the other healthy fetus seems intuitively wrong when the pregnant woman is willing to bear the burdens of pregnancy anyway. It is the pregnant woman who makes the decision but the moral quandary remains.

One could also object that my focus has mistakenly been on the physical burdens of pregnancy. The real problem, one claims, is social, economic and psychological burdens associated with raising two children compared to raising just one. Arguably, when a pregnant woman chooses fetal reduction and ends the life of one of the healthy twin fetuses, she is doing it not because of physical burdens of pregnancy but because she is not ready to raise two children.

The problem with this objection is that the pregnant woman can avoid burdens of parenthood with adoption – terminating the fetal life is not necessary. This does not mean that adoption, in general, is adoption lite. It most definitely is not (Porter 2012) because adoption requires the woman to bear the burdens of pregnancy. But things are different when the woman has already accepted to bear those burdens. So here is a suggestion: gestate both fetuses and give the other one for adoption. This conclusion might disturb some – it certainly disturbs me. I admit that separating twins raises their own set of ethical issues but it cannot possibly be worse for the child to become separated from her twin sibling that to have the sibling killed.[66]

[65] I thank an anonymous referee at the *Journal of Medical Ethics* for pressing me on the objections.
[66] Or to see this from the other perspective: it cannot be worse for the twin to live without her biological twin than to have no life at all.

Conclusion

In this paper, I have applied the *all or nothing problem* to the ethics of fetal reductions in case of a twin pregnancy. Many people think it is wrong to abort just one of a pair of twin fetuses, at least if the risk and burdens of the pregnancy are somewhat similar when gestating both fetuses. I have argued that while twin pregnancies are, in general, more risky than singletons, it is far from obvious that reducing the number of fetuses from two to one reduces the risk of pregnancy; hence, it is not obvious whether the health risk of twin pregnancies can refute the claim that it is wrong to abort only one of the fetuses. And even though gestating two fetuses were somewhat burdensome or riskier than gestating just one it might not be *sufficiently* less burdensome and risky to make killing only one fetus permissible.[67]

Thus, unless one accepts one of two extreme views—the pro-life view that all abortions are immoral no matter the circumstances, or the pro-choice view that a pregnant woman is morally entitled to end any number of pregnancies for almost any reason, no matter how trivial—the problem persists.

It might be feasible to unveil Horton's solution to the *all or nothing problem* and see if that can solve the problem when applied to the case of fetal reduction in twin pregnancy. Horton suggests to solve the problem by accepting a principle according to which, if we are willing to make a sacrifice, then unless we have adequate agent-relative reasons to bring about a suboptimal outcome, we ought to bring about the best outcome that we can permissibly bring about by making this sacrifice.

This would mean—as I see it—that if a woman is willing to bring *any* fetuses to term, she should be willing to bring twin fetuses to term, because that is the best outcome she could bring about by making the 'sacrifice' of remaining pregnant.[68] However, if there is an adequate agent-relative reason to bring about the suboptimal outcome (gestate one and abort the other), then it is permissible to do so. The question of what is an adequate agent-relative reason to abort the other, is one that I leave to be answered elsewhere.

[67] Horton makes a parallel point when he claims that if you are willing to sacrifice your arms to save one child, you cannot reasonably appeal to having to make a slightly greater sacrifice, such as losing your arms and bumping your head, as a justification for not saving both children.

[68] 'Best' here means that most lives worth living will be saved. Someone sceptical towards utilitarianism – such as virtue ethicists – might have different solutions to the problem.

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Schrödinger's Fetus

Abstract

This paper defends and develops Elizabeth Harman's Actual Future Principle with a concept called Schrödinger's Fetus. I argue that all early fetuses are Schrödinger's fetuses: those early fetuses that survive and become conscious beings have full moral status already as early fetuses, but those fetuses that die as early fetuses lack moral status. With Schrödinger's Fetus, it becomes possible to accept two widely held but contradictory intuitions to be true, and to avoid certain reductiones ad absurdum *that pro-life and pro-choice positions face. It also gives a simple solution to the problem of prenatal harm.*

Introduction

Most authors who have written about the ethics of abortion believe that it is possible to determine the moral status of a fetus[69] (whether it is someone rather than something, whether it has a right to life, and so on) early in that fetus' development, that is, while it still an *early fetus*.[70]

But Elizabeth Harman has argued that two early fetuses at the same level of development and health can nevertheless be radically different in kind. Harman's *Actual Future Principle* (hereafter the AFP) states that an early fetus that will become a conscious being has some moral status, while an early fetus that will die before becoming conscious has no moral status.

Harman states:

> [The AFP] says that an early fetus's actual future determines whether it has moral status. The Principle says that there are two significantly different kinds of early fetuses. Early fetuses that die while they are still early fetuses go through their entire existence without any intrinsic properties that themselves confer moral status. But an early fetus that will become a person is a very different kind of thing: it will one day have the full moral status of a person, and that is a good reason to think it has some moral status now. (Harman 1999: 311–312)

[69] I will define 'fetus' as any post-conception pre-birth being, including embryos. My focus here is on early abortions. Most abortions are done during the early phase of fetal development; therefore, my argument covers most abortions, although it technically covers only early abortions.

[70] for example see Barry and Brogaard (2003); Boonin (2003); George and Tollefsen (2008); Greasley (2017); Lee and George (2008); McMahan (2002); Olson (1997); Pruss (2011); Singer (2011).

The AFP is a promising account of the moral status of the fetus, because it aims to explain the competing intuitions that abortion-rights advocates often feel in regard to the moral status of the fetus: i) I was once an early fetus and ii) abortion kills no-one but prevents someone from coming into existence. Yet, the AFP has received rabid criticism both in academic literature and from public commentators, and very little defence for it has been given since Harman's initial paper.[71] The aim of this paper is to advance and defend the AFP with a concept called Schrödinger's fetus. I show that with Schrödinger's Fetus, we can accept the two widely held but contradictory intuitions and thus avoid certain *reductiones ad absurdum* that pro-life and pro-choice positions face. Contrary to Harman, I believe that it is precisely this possibility of finding a common ground between pro-life and pro-choice positions, rather than explaining the competing intuitions of abortion-rights advocates, that gives us a reason to accept the somewhat weird metaphysics of fetuses. Next, I will give the argument for the claim that early fetuses are Schrödinger's fetuses.

The argument for Schrödinger's fetus

Consider the following case.

> *Standard Fetus*. A pregnant woman wonders whether her early fetus is a person yet. She reasons that whether her fetus is 'someone' (rather than something), has moral status or a right to life, can be determined now, while the fetus is an early fetus.

Although the Standard Fetus seems obvious, it might lead both pro-life and pro-choice advocates to trouble. Pro-lifers should accept that miscarriages are a serious problem because each miscarriage kills a person similar to one of us (Murphy 1985; Ord 2008; Lovering 2013; Berg 2017; Simkulet 2017; Greasley and Kaczor 2017; Räsänen 2018). Yet, few pro-lifers see this as a problem or devote any effort to prevent miscarriages.

If early fetuses are persons, then we should also reject our intuitions about the thought experiments where we could save several embryos or a child from the burning building. It would at least be permissible (maybe even obligatory) to save several embryos rather than a child from certain death if one must make such a decision.[72]

[71] For recent criticism see for example a blog post by 'Maverick Philosopher' (2017), Michael Spielman's (2012) article in Abort73.com and Margot Cleveland's (2017) article in the Federalist 'Yes, The Princeton Prof's Argument For Early Abortion Is Stupid.

[72] Many pro-choice scholars use the embryo rescue case to show that the pro-life view is untenable. For example Lovering (2014); Räsänen (2016); Greasley & Kaczor (2018: 27–32).

Pro-choice advocates, on the other hand, seem to be under pressure from the intuition that we have all been early fetuses at some point, yet that abortion does not kill anyone, but rather kills some*thing* or prevents some*one* from coming into existence.

I claim that these challenges can be solved with the following case.

> *Schrödinger's Fetus*: A pregnant woman wonders whether her early fetus is a person yet. She reasons that a being's future is a part of what that being already is now. Whether her fetus is a person, depends on the future the fetus will have. Whether her fetus is a person with a moral status or right to life cannot be determined now, but only later, when the fetus has or has not gained consciousness, at which point the actual future of the fetus is known.[73]

If Schrödinger's Fetus—rather than the Standard Fetus—is correct, it becomes possible to accept the following plausible and widely shared, but contradictory, intuitions to be true:

i) I was once an early fetus.
ii) Early abortion does not kill anybody, but prevents someone from coming into existence.

If the first claim is false, we are faced with serious *reductiones ad absurdum*. Let us begin with the Too Many Thinkers problem (Hershenov 2013). If you, the person, are spatially coincident but numerically distinct (a different being) from the animal (your body), then provided that the person (you) can use its brain to think, so too can the physically indistinguishable animal (your body). But if this is the case, then there would be two thinking beings wherever we thought there was just one. And more than that, it would be hard to see how you could know whether you are the person with psychological persistence conditions or the animal person with physical conditions. If you think that you are the non-animal, the organism would use the same reasoning to conclude that it was too.

One way to reject the Too Many Thinkers problem is to claim that 'I' am living in my brains. According to this reasoning, we all are just a brain-size, composed of just those parts of the human being that produce thoughts and mental states. But this faces another problem, namely Body-self dualism (Lee & George 2008). If I am just my thoughts, memories, mental pictures and so on living in my brain, then it seems that my body is not me, nor even a part of me. My body would thus be

[73] Schrödinger's fetus is indebted to Schrödinger's cat, a thought experiment devised by physicist Erwin Schrödinger. His aim was to illustrate what he saw as the problem of the Copenhagen interpretation of quantum mechanics applied to everyday objects. The scenario presents a cat that may be simultaneously both alive and dead. The thought experiment was an inspiration for the claim that an early fetus has an undetermined metaphysical and ethical nature, although Schrödinger's original proposal was about an epistemological, not a metaphysical problem.

something I control, like a vehicle I am driving. But this is hard to accept. When someone breaks my arm it seems that she hurts me, not just some vehicle that I am using or controlling. But this cannot be right, therefore *i* must be true.

So, the Too Many Thinkers problem and Body-self dualism are powerful *reductiones*, and they give support for the claim that *i* is true. If *i* is true maybe *ii* is false? But there are reasons to believe that *ii* is true as well. If the second claim is false, we are faced with other serious *reductiones*. First: as noted earlier, miscarriages are a serious problem because miscarriages would not prevent someone from coming into existence, but rather kill one of us. Second: we should accept that it is obligatory, or at least permissible, to save several embryos rather than one child if we were in a situation where we cannot save the both. These *reductiones* give support for the claim that *ii* is also true.

An anonymous referee for this paper claims that the 'too many thinkers' argument and the body-self dualism argument are much more convincing than the miscarriages objection and the Embryo Rescue Case, therefore, *i* is much more plausible than *ii*.

The kernel of my idea is this. Both of these (the miscarriage challenge and the embryo rescue case) problems need to be solved if one wants to find a coherent theory for abortion ethics. I am not denying that they could be solved without Schrödinger's fetus. Attempts have recently been made to solve the spontaneous abortion problem (Friberg-Fernros 2018; Blackshaw & Rodger 2019) and the embryo rescue case (Hendricks 2019), and I am confident that the last word on these topics has yet to be said. My proposal simply is that with Schrödinger's fetus, we don't even have to solve these problems, because with Schrödinger's fetus these problems do not arise in the first place.

If *i* and *ii* are both true, then something like AFP and Schrödinger's fetus must be true. Because the idea is controversial, I will spend the rest of the paper defending the AFP and its application, Schrödinger's fetus, against stated and possible criticism.

The objections and replies

In this section, I respond to possible and stated objections against the AFP and Schrödinger's Fetus. Some of the replies are mere clarifications of my position and others are more fulsome responses to deeper objections.

One might argue that the future one will have, because it is a *future,* is not one's property now, but only later. Therefore, the two fetuses (and, indeed, all other fetuses) are similar to each other regarding the properties they now have, therefore the AFP and Schrödinger's Fetus are untenable. For example, professor Kaczor argues that:

> Insofar as some characteristic is actual, it is not going to come to be in the future; and insofar as the characteristic is a future characteristic, it cannot be actual now. A being's future is simply not a part of what the being actually is now, its current nature. In other words, a being's future consciousness is not (yet) an inherent property, since inherent properties are actual properties and what is future is not yet actual. (Kaczor 2015: 222–225).

This line of reasoning claims that a being's future is not—and cannot be—a part of what the being is now.

However, it is not obvious why one's future cannot be a part of what one is now. Consider the following case.

> *Loving Couple.* A married loving couple looks back on their relationship and wonders when exactly their relationship started. The couple concludes that the relationship started on the very first date. It has since lasted to the moment they are in now, and perhaps it will last into the future, too. The couple reason, however, that if the relationship had ended before, say, the third date, then the relationship would not have existed at all. The two dates they already had would not yet count as a relationship.

It makes sense to believe that if they have not had their third date, they have not had a relationship, while at the same time believing that since they had their third date, their relationship started on the first date. Put another way, the couple cannot simply reason at the time of the second date: is this a relationship yet? Only later can it be said whether it was a relationship at the time of the second or first date. The same goes for the fetuses and for their moral status.

Another obvious trouble with the AFP is that the actual future of any particular fetus is unknown, and because it is unknown, the AFP cannot serve as a guide to knowing the moral status of the fetus.

It is true that we do not know the moral status of the fetus while it is an early fetus, but we know its moral status later; and because we can change the moral status of the fetus through our actions, knowing its moral status later is good enough.

So, if we can change the moral status of the fetus through our actions, it shows that the AFP and Schrödinger's Fetus are circular concepts and thus solve nothing, one might claim. For example, consider a woman who tries to decide whether she will abort or gestate the fetus she is carrying.[74] The advocate of Schrödinger's Fetus might say to her: "You are perfectly justified in killing your

[74] For similar reasoning see Spielman 2012.

fetus because your fetus has no moral status." The pregnant woman then asks: "But how do I know my fetus has no moral status?" The advocate of Schrödinger's Fetus answers to her: "Because if your fetus is going to be killed, it does not have any actual future, and hence does not have a moral status."

This objection is problematic because choosing to abort does not in itself justify that very choice. Choosing to abort merely causes a separate fact—a lifelong lack of consciousness (or a lack of future)—that, in turn, makes that choice to abort morally permissible. Suppose it is a crime to serve alcohol to someone who is going to drive later. Now imagine that I serve a glass of Glenfiddich to my friend, who is planning to drive home drunk afterwards. It has been a long night, and my friend is already very drunk, so that the scotch I give him knocks him out before he manages to get into his car. In that case, my act of serving the alcohol made that very act legal in a fully coherent, but perhaps counter-intuitive and surprising, way (adapted from Girgis 2017). Similar reasoning is behind Schrödinger's Fetus.

Perhaps one might claim that Schrödinger's Fetus is logically invalid because a fetus cannot at the same time be both a person and a non-person. Thus Schrödinger's Fetus is against the law of non-contradiction, which states that the same attribute cannot at the same time belong and not belong to the same entity.

However, this objection is misplaced. Schrödinger's Fetus is not both a person and a non-person. Schrödinger's Fetus either is or is not a person, while being an early fetus, but whether it is a person cannot be determined while the fetus is an early fetus, because we do not know its actual future.

One could also claim that Schrödinger's Fetus does not explain why prospective parents grieve when they lose their unborn child by miscarriage. Thus grief, as some have argued (Porter 2015), tells against person-denying arguments for the permissibility of abortion.

But grief and moral status do not go hand-in-hand. I can grieve losing my teddy bear or something else I have formed affection to, but that does not mean the teddy bear has a moral status. Grief is mainly about losing something one loves, not losing something that necessarily has moral status.

One might also claim that Schrödinger's Fetus and the AFP seem to lead to implausible or at least highly counter-intuitive conclusions, and thus cannot be correct. Consider Nobis' thought experiment of a Never-been-conscious comatose patient:

> Suppose a thirty-year-old individual has been in a coma all her life, from birth and even before […] However, she will wake up in ten minutes, unless the "plug" is pulled on her in five minutes (and she will then immediately die.). If she wakes up and

> becomes a subject of conscious experience, then she will have (and has always had) moral status, according to the AFP, and it has always been wrong to pull the plug. But, if the plug is pulled in five minutes, then it would not have been wrong to pull it because her dying would have prevented her from becoming a conscious person, something with moral status.(Nobis 2002: 60)

Many would think that it would not be morally permissible to pull the plug just five minutes before she would wake up and become a person. But, according to the AFP, there is nothing morally wrong in pulling the plug. Since our intuitions tell us that it is indeed wrong to pull the plug in such a case, then AFP and Schrödinger's Fetus should be jettisoned.

But our intuitions in the above case might not be reliable. We are mixing the permissibility of the act and the moral character of the one acting. It would be extremely cruel and vile to keep such a person alive for such a long time just to kill it a moment before she could become conscious. For example, if a woman has a right to terminate the pregnancy because of her bodily rights, as Thomson (1971) has claimed, it would seem that she also has a right to terminate the pregnancy just moments before birth. Although it might be *permissible* for her to do so, it still would be an indecent, vile, and even perverse thing to do.

It might even be all things considered wrong to pull the plug in the Never-been conscious comatose patient case because of the labour and energy put forth to keep him alive, although it would not be wrong to pull the plug because of the comatose patient himself. Such an individual does not have a moral status, as the AFP says, but it might still be wrong to pull the plug because he has been kept alive for such a long time with such a hard work and effort and because of so little (waiting a few minutes) he could be wakened and gaining moral status. If the never-been conscious comatose patient is on a par with pregnancy, this objection merely shows that abortion is indecent, but morally permissible, just moments before the fetus gains consciousness.

Although the previous objections might be resolved, Schrödinger's Fetus does not seem to explain the wrongness of lethal in-utero harm done by third parties, since the fetus that dies is not a person, and cannot be wronged. The moral problem of in utero harm is this: we usually believe that if a harmful act wrongs a person, then a more harmful act wrongs the person even more. We also believe that death is usually more harmful than a mere injury. Yet many people believe that while it is wrong to harm a fetus that is going to survive, killing the fetus via abortion is not wrong. But if killing a fetus is not wrong, then it might be difficult to explain the wrongness of lethal in-utero harm done by third parties such as a violent attacker who kills the fetus inside the pregnant woman.

Even though the fetus that dies is not a person, and harming it cannot be prosecuted *per se*, it can be prosecuted as a damage to the mother: a woman has lost something that belongs to her (in addition to the fact that her bodily autonomy was violated), even though she has not lost anything intrinsically valuable. For example, if someone kills a pregnant woman, she has only committed one murder—not two—although there might be factors that would make such a crime especially cruel, and therefore punishment more severe.

According to another objection, the AFP and Schrödinger's Fetus confuse intrinsic properties with essential properties. Although having a certain future would be an intrinsic property of an entity, it is not an essential property of the entity, as essential properties are properties that make an individual the same individual through time (Tollefsen 2008).

But being the same individual through time is not what matters morally. I am the same person today as I was yesterday, but that is not what gives me moral status. If I were a different person tomorrow, it would still be wrong to kill me today. So it is not the AFP that confuses intrinsic and essential properties, it is the objector who confuses essential properties with moral-status-conferring property.

Lastly, one might question the need for Schrödinger's Fetus. That is because pro-choice advocates already believe abortion is permissible, and pro-lifers would probably not be convinced by the idea of Schrödinger's Fetus in the first place. So who needs Schrödinger's Fetus?

There are two main audiences for Schrödinger's Fetus. First, there are those who believe that abortion is permissible because a fetus is not a person but who still feel that we all had moral status while being early fetuses. With Schrödinger's Fetus, it is possible for them to believe that abortion merely prevents someone from coming into existence while accepting that we all were early fetuses. They can thus reject the weird premise that 'I' am just my thoughts, beliefs, and mental states that came into existence after our body came into existence. Second, there are those who believe that abortion is wrong, yet do not invest any effort in trying to prevent spontaneous abortions. The thought is this: these people seem to believe that nothing morally bad happens in spontaneous abortions. With Schrödinger's Fetus, they will realise that nothing morally bad happens in induced abortions either, because the fetus that dies is not a someone and lacks a moral status, yet they get to keep their deeply held intuition that we were all early fetuses once.

Conclusions

I have proposed that we should prefer *Schrödinger's Fetus* over *Standard Fetus*. There are cases where what something is now can only be determined later, when the future of that something is known.

Assuming that my defence for Schrödinger's Fetus is sound, we should prefer them over pro-life positions, because we can thereby avoid the moral implications of natural embryo loss. We should also prefer Schrödinger's Fetus over other pro-choice positions, because we can thereby avoid *reductiones ad absurdum* such as too many thinkers problem and body-self dualism. And assuming that simplicity is a philosophical virtue, we should prefer Schrödinger's Fetus over Harman's principle, because then we do not need further arguments to explain in-utero harm (such as harming future individuals, see Wilkinson et al. 2016). The AFP alone cannot explain the wrongness of in-utero harm, because according to it, early fetuses that survive have only some moral status. If early fetuses have only some moral status, then harming them could sometimes be permissible. But we do not usually believe that harming fetuses in utero is ever permissible. So in-utero harm harms a being that has a full moral status. That is true, even though early abortion is always morally permissible when the fetus dies, because such a fetus lacks moral status. That is because early fetuses are Schrödinger's Fetuses.

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Age and ageing: what do they mean?

Abstract

This article provides a philosophical overview of different approaches to age and ageing. It is often assumed that our age is determined by the amount of time we have been alive. Here, I challenge this belief. I argue that there are at least three plausible, yet unsatisfactory, accounts to age and ageing: the chronological account, the biological account, and the experiential account. I show that all of them fall short of fully determining what it means to age. Addressing these problems, I suggest the Two-tier principle of age: whenever the three accounts of age contradict, combine the two accounts that differ the least, and reject the third. However, while this principle does solve some difficulties, it is itself vulnerable to problems; therefore I propose we should jettison it. I conclude that there are no accounts to ageing that are satisfactory; they all come with a bullet to bite.

Introduction

It is commonly assumed that chronological time determines our age; that is, that a person's age is determined solely by how long he or she has existed. For instance, someone born in 1990 is 30 years old in 2020. While philosophers have been interested in the metaphysics of time for quite some time now (McTaggart 1908; Gofrey-Smith 1980; Norton 2018), and bioethicists have asked whether ageing is bad for us (Hauskeller 2011a; 2011b), a disease to be cured (Caplan 1981; Murphy 1986), or whether considerable life extension is preferable (Häyry 2018; Davis 2018; Rantanen 2019), less ink has been spilled on questions regarding what it means to age or how one's age is determined.

Here, I challenge the belief that chronology is what determines our age and that ageing simply means a number of days, months, or years have passed since our births.[75] What follows should not

[75] However, I am not the first to claim that chronological age is a problematic concept when it is used to define human ageing. Baars (2007) argues that chronological age cannot by itself give any precise reference to (a phase of) ageing processes. It is also argued (in Räsänen, 2019a; 2019b), that the distinction between chronological and biological age warrants legal age change in some context. However, the view presented here is more fundamental and deeper than presented in Räsänen (2019a) or in Baars (2007).

only be of interests to transhumanists aiming to achieve eternal youth and claiming we should try to stop our ageing process,[76] but also for bioethicists studying the ethics of new biotechnologies.[77]

This study is not mere philosophical arguments about biotechnologies that might never happen. I will systematically study our intuitive thinking on age and ageing. Some of the issues related to the concepts I am analysing are already present in e.g. health care rationing.[78]

The structure of the article is as follows. First, I propose a series of thought experiments illustrating how we, in fact, think (and how we should perhaps think) about our age and ageing. I raise three possible views on what matters when it comes to age and ageing: chronology, biology, and conscious experiences. I show that while all of them have some intuitive appeal, applying them consistently leads to results that might be too difficult to accept. I then try to solve these problems by forming an account called the two-tier principle of age, where any two corresponding ages are combined. I argue that the two-tier principle of age, while solving some of the problems raised, ultimately cannot be used successfully because it itself faces similar difficulties. I conclude by arguing that when it comes to the question of how we should understand age and ageing, there are no obviously right answers that everyone could accept.

Thought experiments on age and ageing

In this section, I propose three possible accounts of age and ageing and show the problems they raise. To do so, I want the readers to consider several thought experiments and consult their intuitions behind the cases.

First, consider the following.

> *Cryopreservation while alive.* In the near future, it has become possible to preserve living humans at ultra-low temperatures and wake them up after several decades. This technology

[76] For instance, Bostrom (2005) sees biological ageing as a process that we are morally obligated to stop and Moen (2015) argues it is rational to cryopreserve oneself because of the small chances of lengthening one's life significantly. For a summary of scientific developments that give hope to eliminate biological ageing, see de Grey and Rae (2007).
[77] For an extensive study on the ethics of cryonics see Minerva (2018).
[78] To give one example, in responding to COVID-19 pandemic, Swedish ethics platform for priority setting in healthcare is giving guidelines on how to prioritize among intensive care patients and how to ration other parts of the healthcare system to free up resources for use where they are needed the most. The work leader professor Lars Sandman said that in Sweden they should take biological—not chronological—age to account, so one of the main thrusts of their guidelines is how to interpret biological age in dire situations (Weinberg, 2020). For a broader discussion on age-based rationing in healthcare, see Jecker (2013). See Lippert-Rasmussen and Petersen (2020) and Räsänen (2020) for discussion on age change in the context of healthcare.

both pauses their biological ageing process and keeps them unconscious throughout, effectively enabling people to subjectively 'travel' to the future. Alex, chronological age of 40, wants to be cryopreserved for 50 years and then woken up. Once 50 years have passed, Alex wakes up in the body of her 40-year-old self, with no recollection of the time she spent in cryopreservation.

How old is Alex when she is woken up? There are two plausible intuitions one might have.

Alex is 90 years old.

Alex is 40 years old.

If you have the intuition that Alex is 90 years old, your intuition might be explained by the claim that it is only chronological time that matters when it comes to age. Put another way: only the amount of time one has been alive matters for how old one is. So, your intuition and the explanation behind Cryopreservation while alive could be as follows:

Intuition: Alex is 90 years old.

Explanation: Alex was 40 years old when she was cryopreserved. Because another 50 years have passed, during which Alex was alive, she must now be 90 years old.

Here, the Intuition and the Explanation form the following view:

Chronological account: the amount of time one has been alive determines how old one is.

Chronology seems a plausible candidate to determine age because in ordinary life, our (legal) age is determined solely by how long we have been alive. However, I find the intuition and the explanation behind Chronological account unreliable. To understand why, consider the next case.

Cryopreservation while dead. In the near future, it has become possible to medically kill humans, cryopreserve their bodies, and reanimate them later. This technology enables people to subjectively 'travel' into the future. Bianca, chronological age of 40, wants to be killed and woken up in 50 years. She steps into a machine that kills her and then freezes her body. When 50 years have passed, Bianca is reanimated in the body of her 40-year-old self.[79]

How old is Bianca when she is reanimated after being dead for 50 years?

[79] One might object here and claim that if the person can be revived he is not dead in the first place. Cryopreservation while dead is thus impossible case. Therefore, either Bianca cannot be brought back alive, or Bianca is not dead during the time of being attached to the machine. I find this implausible because it implies that we cannot know whether someone is dead until far in the future—or perhaps never.

If chronology—the amount of time one has been alive—determines one's age, then Bianca must be 40 years old, because she did not exist while she was dead and non-existing people do not age chronologically.

So, in Cryopreservation while dead, Bianca is chronologically 40 years old upon reanimation. However, in Cryopreservation while alive, Alex is chronologically 90 years old when she wakes up, because she was alive and existed during the period of her cryopreservation. But is the mere difference in their chronology relevant? Many rights and duties depend on how old one is. So if Alex is 90 but Bianca is 40 years old then Alex should be entitled, for example, to retirement benefits more than Bianca. But that does not seem correct. So if you believe, as I suspect, that Alex and Bianca should be treated similarly when it comes to age related rights and duties, the easiest explanation for this is that Alex and Bianca are the same age.

Now, if you believe Alex and Bianca are the same age, you should either reject the intuition behind Cryopreservation while alive or the intuition behind Cryopreservation while dead. I think it is more plausible to reject the intuition that Alex, who was alive, has aged, than to reject the intuition that Bianca, who was dead, has not aged. So, if you initially believed that Alex in Cryopreservation while alive is 90, you should now revise your belief and reject the view that chronology determines our age.

If Alex is not 90 after the cryopreservation, could she be 40? Suppose you had this intuition in the first place after Cryopreservation while alive. Your intuition might be explained by the claim that it is only conscious experience that matters; that is, one's age is determined by how long one has lived her life. So, your intuition and the reasoning behind the Cryopreservation while alive could be the following:

> Intuition: Alex is 40.
>
> Explanation: Alex was 40 years old when she was cryopreserved. Although she was technically alive during the 50 years of her cryopreservation, she was fully unconscious the whole time, so she did not have any experiences amounting to a lived life during that time. Because conscious experiences matter, Alex must now be 40 years old.

Here, the Intuition and Explanation form the following view:

> Experiential account: The amount of time one has been conscious and lived her life determines how old one is.

Consciousness seems a plausible candidate for determining our age, because living a human life essentially boils down to having experiences. While Experiential account seem to solve the bare-

difference argument presented above, by treating Alex and Bianca as equally old because neither of them lived their lives during the 50 years, I find the intuition and the explanation behind it to be unreliable as well. To understand why, consider the next case.

> *Coma*. Charlie is 20 years old when she is in a serious car accident that causes her to fall into a coma. She is unconscious, but kept on life support in a hospital because of a slight chance of waking up. Finally, after 30 years in a coma, Charlie wakes up in the body of a 50-year-old-woman, yet with no recollection of conscious experience after her accident as a 20-year-old.

How old is Charlie after she wakes up from the coma? I believe you agree here that there is only one plausible answer, which is the following:

> Intuition. Charlie is 50.
>
> Explanation. Charlie was 20 years old when she fell into a coma. Because 30 years have passed during which Charlie was alive and her body aged normally, although she was unconscious, she must now be 50 years old.

So far, we have considered two possible intuitions and their explanations behind Cryopreservation while alive and saw that they were unreliable. These were Chronological account and Experiential account. But there is a third possibility.

If your initial intuition was that Alex is 40 years old, it might be explained by the claim that it is biology that matters. So, your intuition and the reasoning behind Cryopreservation while alive could be the following:

> Intuition: Alex is 40.
>
> Explanation: Alex was 40 years old when she was cryopreserved. Although 50 years have passed, Alex did not age biologically. Because it matters how fit and healthy one's body is in a physiological or biological sense, Alex must now be 40 years old.

Here, the Intuition and the Explanation form the following view:

> Biological account: One's biological fitness and health determines how old one is.[80]

[80] Several approaches to quantify biological age (senescence, as it is sometimes called) have been used, including the use of biomarkers in the form of serum analytes, epigenetic markers or frailty index. See Jazwinski & Kim (2019).

Biology is a plausible way to determine our age, because our intuitions about growing old seem to relate mostly to the gradual deterioration of our organism and its functional characteristics. But is the intuition and explanation behind Biological account reliable? Consider the following case.

> *Anti-ageing pill.* Scientists have discovered a 'cure' for biological ageing. When a person takes the anti-ageing pill, it stops her biological ageing process. Diane, chronological age of 40, takes the pill. After 50 years, Diane's body is still physiologically indistinguishable from that of an average 40-year-old woman.

How old is Diane 50 years after taking the pill? If you accept Biological account, you should think that Diane is 40, because although she has lived through 90 years of conscious experience, her body is that of a 40-year-old woman.

But I believe few would think that Diane is 40. It seems that all possible answers to the question of Alex's age in Cryopreservation while alive turned out to be unreliable because the principles behind the intuitions lead us to conclusions that are too difficult to accept.

So, we therefore are forced to conclude that if Diane is not 40 years old in Anti-ageing Pill, she must instead be 90.

> Intuition. Diane is 90 years old.

But what might explain the intuition here? At this point, I want to propose a hypothesis. Consider the following principle.

The Two-Tier Principle of Age (TTPA): Whenever the accounts from chronology, consciousness, and biology contradict one another on the question of someone's age, we should seek guidance from whichever two accounts differ the least from one another, and reject whichever account remains.

How might we test this hypothesis? We can see whether TTPA gives the same answers as our intuitions when faced with different thought experiments. First, TTPA seems to explain our intuition in Anti-ageing pill. Since we do not (intuitively) think Diane is any younger after taking the anti-ageing pill, something like TTPA is needed to explain why believe so. But, let us first test TTPA on some more thought experiments. Consider the following.

> *Ageing Pill*. Scientists have created a pill that causes the person taking it to instantly age 50 years biologically. Elizabeth, chronological age of 40, wants to become biologically old (just to see how it feels) and takes the pill. Her body instantly transforms into that of an average 90-year-old woman; she now has wrinkled skin, grey hair, loss of eyesight, cardiovascular problems, stiff joints, and loss of body fat and muscle.

How old is Elizabeth after taking the pill? I doubt you think she is 90. There is an obvious intuition.

> *Intuition.* Elizabeth is 40.

What might explain this intuition? Let us consider our hypothesis: when chronology, consciousness, and biology contradict one another, we should seek guidance from whichever two correspond.

Elizabeth is chronologically and experientially 40, yet biologically 90. According to the TTPA, we should seek guidance from the two that correspond—in this case, chronology and consciousness. Thus, Elizabeth must be 40.

The TTPA works well with the intuition behind the Ageing Pill and explains why we think (intuitively) that Elizabeth still is 40 after taking the pill: she is chronologically 40 and has had 40 years of conscious experiences.

But just because TTPA can explain the intuition behind the Ageing Pill does not mean we should endorse TTPA. Can TTPA explain our intuitions in other cases? Consider the following case.

> *Computer Upload.* It has become possible to transfer a person's brain into a computer, enabling one to have decades' worth of conscious experiences in a millisecond. Francine, chronological age of 40, is curious about this new technology, so she uploads herself into the computer. In an instant, she subjectively lives out five decades of a full, rich human life. Everything—from the mundane pleasures of reading and listening to music, to the sublime joys of falling in love and going on adventures in distant lands, to the hardships of heartbreak and losing a loved one—is instantly rendered in full sensory and emotional fidelity. After a millisecond, she is detached from the computer, yet she has subjectively lived her life for 50 years.

How old is Francine after the computer upload? While the case is quite far-fetched, I think the obvious intuition is that Francine still is 40 – not 90. Francine is chronologically and biologically 40, but she has 90 years of conscious experience. According to the TTPA, we should seek guidance from the two ages that correspond together, that is, chronology and biology. They say Elizabeth is 40.

The TTPA works well with the intuition behind Computer Upload and explains why we think (correctly) that Francine still is 40 after computer upload: because she is chronologically and biologically 40.

But even TTPA's ability to explain the intuition behind Ageing Pill and Computer Upload might still not be enough to endorse it fully. Can TTPA explain our intuitions in other cases as well? Consider yet another case.

> *Computer Upload with Cost.* It has become possible to transfer a person's brain into a computer, enabling one to have decades' worth of conscious experiences in a millisecond. However, this technology has a drawback. For every year's worth of conscious experiences received this way, the person also ages biologically by one year. Gina, chronological age of 40, is curious about this new technology. Informed about the cost, she consents to have 50 years' worth of conscious experience. In an instant, she subjectively lives out five decades of a full, rich human life. Everything—from the mundane pleasures of reading and listening to music, to the sublime joys of falling in love and going on adventures in distant lands, to the hardships of heartbreak and losing a loved one—is instantly rendered in full sensory and emotional fidelity. After a millisecond, she is detached from the computer, yet she has subjectively lived her life for 50 years. Moreover, her body is now that of a 90-year old woman; she has wrinkled skin, grey hair, poor eyesight, cardiovascular problems, stiff joints, and loss of body fat and muscle.

How old is Gina after the computer upload? This is the most far-fetched thought experiment so far, and I think the most obvious intuition is that Gina is now 90 years old, rather than 40. But if you are not sure, imagine yourself in the place of Gina. Imagine that you experience 50 years' worth of subjective life while your biological age increases by 50 years. Would you not then *be* 50 years older?[81]

I assume now that you believe you would be 50 years older if you had 50 years of conscious experience while simultaneously aging 50 years biologically. If you believe so, you should also believe that Gina is 90 years old after her brief upload to the computer.

The TTPA works well with the intuition behind Computer Upload with Cost and explains why we think (correctly) that Gina is 90 after computer upload: because she is biologically 90 and has had a total of 90 years of conscious experience.

So far I have presented seven thought experiments where chronology, biology, and consciousness differed. I thus covered all possible cases where one of them differed while the two remain the

[81] If you think, as I do, that imagining yourself in the place of Gina makes the intuition that the machine ages the person attached to it, stronger, it might be because only when you imagine it happening to yourself, you can give sufficient weight to the bodily and mental experiences. See also Shoemaker (1994) on the shift from third-person to first-person in thought experiments.

same. I showed that chronology, biology or consciousness alone could not explain how old someone is. I proposed a principle called Two-Tier Principle of Age and showed that it explained our intuitions behind the seven thought experiments. Next, I will show why I still think we should reject the Two-Tier Principle of Age.

Rejecting the two-tier principle of age

Consider the following case.

> *Anti-ageing pill with a side effect.* Helen, chronological age of 30, takes the anti-ageing pill that stops her biological ageing process. However, the pill has a side effect: it causes Helen to fall into a coma 30 years after taking the pill. The coma lasts for 30 years. When Helen wakes up from the coma, how old is she?

There are three possible intuitions, but TTPA cannot explain any of them because chronology, biology, and consciousness all differ from each other.

The plausible answers, to the question of how old Helen is, are:

> Helen is 90 (because she has been alive for 90 years).
>
> Helen is 60 (because she has experienced 60 years of conscious life).
>
> Helen is 30 (because her body is that of a 30-year-old woman).

Here the TTPA offers no help, and I think that is a good enough reason to jettison the principle. We simply cannot use a principle that cannot give us any answers in cases where biology, consciousness, and chronology all differs from each other significantly.[82]

So, how to continue here? I think Anti-ageing pill with a side effect is too far-fetched for our intuitions from that case to serve as evidence about how we should think about age in other cases. Indeed, it might be difficult to form any reliable intuitions about this case in the first place. If you claim to have an intuition about how old Helen is, you are likely to apply your intuitions from earlier thought experiments, rather than forming genuine new intuitions about this case. Thus, Anti-ageing pill with a side effect itself does not seem to prove or explain anything.

[82] Consider for instance another version of the cryopreservation case, wherein the person ages biologically at a rate of only 10% of normal speed. TTPA cannot explain her age in these kind of cases.

I believe we simply have to choose between Chronological account, Experiential account, or Biological account. Thus, it is ultimately about choosing which bullet one is willing to bite. Let us consider which of the three principles is the easiest to accept.

Which view on age to choose?

When I tried to show that chronological age does not matter, I presented two analogous case where the difference between the cases was only in one detail. In the first case, Alex was cryopreserved while she was still alive. Her body was kept alive and unconscious in a machine that stopped her biological ageing. In the other, Bianca was killed and her body cryopreserved at the moment of death, before being reanimated into that same body.

When Alex woke up and Bianca was reanimated, neither of them had aged biologically and neither had any conscious experiences; the bare difference was that Alex had been technically alive while Bianca had been technically dead. I argued that it is very difficult to believe that Alex is older than Bianca.

Now, one might object here that I have misunderstood chronological age. My assumption regarding chronological age was as follows:

> Chronological account: the amount of time one has been alive determines how old one is.

But one could claim that the amount of time one has been alive is not what chronological age is. One might instead adopt the following slightly revised assumption:

> Chronological account$_2$: the amount of time it has passed since one was born determines how old one is.[83]

If the latter understanding of chronological age is correct (rather than the former), then dead people do age, contrary to what I have assumed. And if dead people age chronologically, then Bianca is as old as Alex is (both would be 90) – contrary to what I assumed, namely that neither of them have aged. One could then say that it is this latter understanding of chronological age that matters in determining one's age.

However, I do not think my initial assumption on chronological age is mistaken. The reason for this is that if we use the other understanding of chronological age, then it leads to views that are obviously wrong. For instance, consider the following claim:

My great-great-grandfather, born in 1870, is 150 years old.

[83] This is endorsed for example by Baars (2007: 3).

The above claim seems to be false. Instead, the following claim seems to be true:

My great-great-grandfather, born in 1870, would be 150 years old if he had never died.

If the latter claim is true and the former claim is false, then the revised view of chronological age cannot be true. If, on the other hand, the revised view for chronology is true, then the following sentences are also true: "Julius Caesar is 2120 years old" or, "Tutankhamun is 3,300 years old". However, it is very difficult to believe that these statements are true. For them to be true, we should accept the counter-intuitive claim that someone (or something) that does not exist (anymore) – like my great-great-grandfather, or Julius Caesar, or Tutankhamun – could age. Further, what if we could magically reanimate Tutankhamun? Would he then be 3,300 years old? I doubt you think so. Tutankhamun would be as old as he was when he died, which was 19 years old.

If you think Tutankhamun would be 3,300 years old when he is brought back to life, you must be basing your view on how old Tutankhamun's body would be if he were somehow reanimated into a living body with a biological age equivalent to the age of his mummified remains. In such a scenario, he might well be 3,300 years old. But this merely shows that it is indeed biology that matters – not chronology – when we think of how old Tutankhamun would be if he were brought back to life today.

One might also suggest that one does age while dead, provided one is brought back to life later.[84] But this would mean that the decision to reanimate Tutankhamun determines how old he is. I find it difficult to believe that the mere act of reviving Tutankhamun would cause him to age more than 3000 years.

There is yet a further problem with the revised chronology view. Suppose you would invent the time machine. Suppose further that you would travel back in time to 100 years before you were born. Now, in this case, you would be negative 100 years old. But surely this is not true. Surely, you are as old as you were at the time you entered the time machine and travelled back in time.

I believe I have now given enough reasons to believe that my initial understanding of chronological age is indeed true. If my initial understanding of chronological age is true, then Alex and Bianca have different chronological ages. But when we consider how old they are, chronological age is not the answer, unless one is willing to bite the bullet that Bianca should be treated very differently than Alex because they are different ages.

[84] I thank an anonymous referee at *Ratio* for this suggestion.

Those not yet convinced that Chronological account is untenable should consider the following case.

> *Cryopreservation of a child.* In the near future, it has become possible to cryopreserve living humans and wake them up after several decades. This technology stops their biological ageing process and keeps them unconscious, effectively enabling people to subjectively travel into the future. Alex, chronological age of 8, wants to be cryopreserved and woken up in 50 years. The machine keeps her unconscious during the whole time and stops her biological ageing (but technically keeps her alive). When 50 years have passed, Alex is woken up and her body is that of an 8-year-old girl.

It would be absurd to think that Alex, now cryopreserved at the age of 8, would be ready to vote, drive, drink alcohol, and consent to sex or marriage after the procedure. Thus, it would be absurd to think that she would be older than eight years old after spending 50 years in the cryopreservation machine.

I do not think we should bite this bullet (although I admit that someone might be willing to do so). Therefore, I do not think chronological age matters when we ask how old someone is. But perhaps Experiential account offers an easier bullet to bite.

To demonstrate why consciousness does not matter in determining one's age, I earlier proposed a scenario wherein someone falls into a coma for several decades, and then asked whether you though she had not aged. I assumed that the initial intuition would be that she had indeed aged, despite the fact that she had been unconscious and she had not 'lived' her life. But could it be possible to accept this view?

If you think we should accept that comatose patients have not aged because they have lived their life less than others, then you might have to accept some other, even more radical conclusions as true, too.

Consider two people born at the same day, Ida and Jane, who live their lives in an almost identical way except in terms of sleep. Ida sleeps on average 6 hours per night, while Jane sleeps 9 hours per night. Ida would then be conscious approximately 1100 hours more than Jane in a given year. That means that roughly every 8 years, Ida will have lived a full year longer than Jane in terms of conscious, subjective experience. Despite this, I doubt that anyone would think Ida is older than Jane. If one is not willing to accept that Ida is older than Jane, we should finally reject the experiential account when it comes to age and ageing.

When we considered whether biology determines our age, I asked you to imagine a case where Diane takes the anti-ageing pill that stops her biological ageing process. I assumed that there still is an intuition that she is 50 years older 50 years after taking the pill. If biology is what matters, we should reject this. But perhaps it is not as difficult to accept that the anti-ageing pill actually stops you from ageing. However, if one wants to endorse the biological account, one might have to accept other, even more difficult conclusions, too.

Consider the following.

> *Grand Master.* Grand Master has lived for thousands of years; no one knows exactly how many. Biologically, he does not age. His body is that of a 50-year-old man and has been so for thousands of years. He remembers what has happened during those years at least as vividly as a normal 50-year-old remembers his own twenties. Grand Master knows dozens of languages and hundreds of skills, from archery to differential calculus, because he has had thousands of years to practice them. He has had multiple lovers, wives, children, and friends who have all died years ago. He has experienced many times more of anything than anyone else.

If Biological account is true, then Grand Master really is 50, but it is tempting to say that he is thousands of years old. Suppose further that the grandmaster suddenly falls ill and needs a lifesaving organ transplant. Suppose further that there is another patient, aged 60, who needs the same organ. If Grand Master is younger than the other patient, then Grand Master should get the organ, since justice requires, in general, prioritizing the lives of younger people. But surely we should take into account the fact that the grandmaster, while biologically younger, had actually existed and lived his life for thousands of years. So, justice actually requires that the organ go to the biologically older patient – something we would miss if we view biology as the sole factor determining age. This is another reason to be sceptical that biology determines how old we are.[85]

Some concluding remarks

In this paper, I challenged the belief that chronology determines our age. I used philosophical thought experiments to show that it is not always obvious how we should think about someone's age.[86]

[85]Lippert-Rasmussen and Petersen (2020) use similar reasoning against age change in the healthcare context.

[86] It is possible to create more cases where, for instance, a person ages very slowly biologically while being cryopreserved or where a coma patient is not entirely unconscious but constantly feels

I proposed three plausible but ultimately unsatisfactory accounts to ageing. I tried to solve the problems by applying any two corresponding views together and this way tried to determine someone's age. Yet, even this two-tier account to age is vulnerable to persuasive counter-examples, so I claimed that the matter eventually boils down a choice of which bullet one is willing to bite.

I did not choose my side on the issue here, but I hope I have defined and clarified the plausible philosophical positions one could take on age and ageing.[87] My considerations suggest that it is far from obvious which side we should take and which bullet we should bite in a given scenario. It is not obvious how we should think about our age and ageing because our concept of age seems poorly adapted to unusual scenarios where our biology, chronology, and consciousness diverge. If my analysis is right, I have managed to show – as far as arguments from thought experiments go –, that the question of how to determine one's age has yet to be answered in a satisfactory way.

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minimal pleasure. This sort of cases complicates the analysis further, and for simplicity I have not dealt with such cases in this paper.

[87] This is what some philosophers think is true philosophical bioethics. See Häyry (2015).

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Moral case for legal age change

Abstract

Should a person who feels his legal age does not correspond with his experienced age be allowed to change his legal age? In this paper, I argue that in some cases people should be allowed to change their legal age. Such cases would be when: 1) the person genuinely feels his age differs significantly from his chronological age and 2) the person's biological age is recognized to be significantly different from his chronological age and 3) age change would likely prevent, stop or reduce ageism, discrimination due to age, he would otherwise face. I also consider some objections against the view that people should be allowed to change their legal age and find them lacking.

Introduction

Suppose that someone feels his age is not correct and wants to make himself legally 20 years younger on the grounds that he is being discriminated against due to his old age. Should he be allowed to change his legal age?[88]

The question is not a joke, at least if we believe that Dutchman Emile Ratelband is being serious. (see BBC News 2018 on the case) Ratelband (legal age of 69) claims that he is often discriminated against because of his old age. He states that due to having an official age that does not reflect his emotional state he is struggling to find both work and love. Therefore, he has asked a Dutch court to change his date of birth to 20 years later to his current birthday.

Here, I consider whether there are compelling moral arguments for the view that people should be allowed to change their legal age. The structure of the paper is the following: After clarifying some groundwork, I make the argument why, and in what cases, people should be allowed to change their legal age. I then consider some immediate objections against the view that people should be allowed to change their age and show why they are unsuccessful.

Before going into the arguments, some clarifications are needed. First, I do not deny the fact that there is a certain *chronological* age – the length of time that each particular person has existed. With most people, chronological age corresponds well with emotional and biological age and thus it is

[88] Legal age (or official age) should be understood here as the age one is according to legal documents such as passport. To change one's legal age, therefore, would mean to change one's birth date in these documents. Legal age is important because many rights and duties depend on one's legal age (right to vote, drive a car or drink alcohol for example).

often unproblematic that legal age equals chronological age.[89] But this is not always the case. I argue that sometimes, it is ethically permissible for people to change their legal age so that it matches their *biological* and *emotional* age – even though this would be contrary to their chronological age.[90]

Second, some people might claim that because sex change is permissible, age change should also be permissible. While I feel certain sympathy for this strategy, I do not argue from analogy: that *because* sex change is permissible, so is age change. The aim of this paper is to make an independent argument that will work whether or not one accepts the claim that sex change is both possible and permissible.

I am interested in cases where a person faces discrimination because of his age and has a mismatch between his emotional and chronological age *and* a mismatch between his biological and chronological age. The reason for this is two-fold. First, if there are no compelling arguments for legal age change when both mismatches and risk of being discriminated are present, then, there is unlikely to be a case for legal age change when just one of the mismatches or discrimination is present. Second, if there is a compelling argument for legal age change in cases where the three conditions are met, this opens up further research questions such as what are the sufficient and necessary conditions for age change. However, it is beyond this study to determine these conditions. My aim here is simply to argue that at least on some occasions it is possible to give a moral justification for legal age change.

A moral argument for age change: preventing discrimination

In this section, I make a moral argument for the view that in some cases, people should be allowed to change their legal age. What kinds of motives might someone who wants to change his legal age have?

A possible reason for wanting to change one's legal age is discrimination based on age.[91] The argument for age change that is built on age discrimination, ageism, can be framed as follows.

[89] For example, we think 18-year-olds are more capable of acting responsibly than 16-year-olds, and we think the eyesight of 80-year-olds is weaker than 60-year-olds – because often that is the case. So while it is *often* appropriate to believe that legal age equals chronological age, this reasoning does not *always* apply.

[90] By emotional age (or experienced age) I refer to the age someone feels and identifies himself. By biological age (or physiological age) I refer to the age one's body and mind appear to others by objective measures.

[91] For an overview of philosophy and ageism see Lesser (1998).

P1) Legal age is a cause of severe discrimination for some people whose biological and emotional age does not match their chronological age.

P2) People should be allowed to secure the relief from severe discrimination against them unless this has excessive consequences.

P3) Changing a person's legal age would not, in the case of people whose biological and emotional age does not match their chronological age, have excessive consequences.

C) People whose biological and emotional age does not match their chronological age should be allowed to change their legal age in order to secure relief from discrimination.

There are reasons to endorse the first premise. Ageism, discrimination on the grounds of age, is a real and common phenomenon. Perhaps the most obvious place where ageism is present is the workplace or the instances of hiring. Ageism in hiring has been shown to exist in many countries such as Belgium (Baert et al. 2016), England (Riach & Riach 2010), Spain Albert et al. 2010), and Sweden (Ahmed et al. 2012).

While discrimination based on age exists, one might believe that it is not morally wrong to discriminate based on age. One might thus contest the argument by claiming that ageism is not wrong at all. Here, I assume that wrongness of discrimination is built on the following features.

i) Discrimination is based on membership in a socially salient group that the individual being discriminated against does not consciously choose to belong to.
ii) Discriminatory conduct imposes some kind of disadvantage or harm on the persons at whom it is directed.

The groups must be 'socially salient', meaning that the groups must be important to the structure of social interactions across a wide range of social contexts (Lippert-Rasmussen 2006). So, groups based on race, religion, age or gender qualify as grounds for discrimination, but groups based on musical or culinary tastes, or other personal preferences of persons do not. Belonging to the former groups is also something that is not consciously chosen, unlike choosing to belong to a neo-Nazi party, for example. Since being a specific age can be understood as belonging to a specific socially salient group that one does not choose to belong to (such as teenagers, early mid-life, late mid-life, young old, elderly etc.) and because discrimination against someone because he belongs to such a

group imposes economic and psychological disadvantages for him – and thus harms him – discrimination based on age is morally wrong.[92]

However, not all who want to change their legal age suffer from ageism. And not all who suffer from ageism have mismatches between their emotional, biological and chronological ages. My argument does not cover these instances. The aim here is simply to show that at least in some cases there are compelling moral arguments for age change and, therefore, legal age change should be permitted in such cases. Because *some people* who have mismatches between their ages face ageism, there is a reason to endorse the first premise.

There are also reasons to endorse the second premise: people should be allowed to secure the relief from severe discrimination against them unless this has excessive consequences. The premise is based on assumption that changing age in fact would secure the relief from discrimination. It seems correct that if a person suffering from ageism were able to change his legal age to younger, he would face less discrimination against him in hiring. An analogy might help illustrate this. Certain minorities, such as Muslim immigrants, are often discriminated against in hiring because of their foreign names. Studies in Sweden have shown that when immigrants have changed their names, they have faced less discrimination in hiring (Khosravi 2012) and their annual earnings have increased substantially (Arai & Thoursie 2009). That is because discrimination was reduced after the name change.

Similarly, if those who are discriminated against because of their age had the option to change their legal age, they would face less discrimination in hiring and at the workplace. That is because others would not be aware of their chronological age and they would therefore receive more invitations for job interviews.[93] I believe it is clear that people should be allowed to secure the relief from severe discrimination unless this has excessive consequences.

The third premise stated that changing a person's legal age would not, in the case of people whose biological and emotional age does not match their chronological age, have excessive consequences. What kind of consequences could be excessive enough to prohibit the age change? In some cases,

[92] Someone might object that people of a specific age do not form a socially salient group. Those who are willing to accept that there is nothing wrong in discriminating based on age (because age does not form a socially salient group) might not be convinced by this paper. Those who believe ageism is wrong but who reject the view that in order to face wrongful discrimination the one being discriminated against must belong to a socially salient group could just replace their own definition of discrimination that would include ageism.

[93] Of course, the job candidates who have changed their age might be rejected at the interview stage, but it would be unlikely that this were due discrimination because employers would not be able to know the candidate's chronological age (hiding the chronological age seems to be behind the reasoning of age change in the first place).

such consequences could be costs for an age change candidate such as not collecting retirement benefits but going back to work. The choice of whether this or other similar costs are severe enough so that age change would not be a better option should be left to the age change candidate. In the next section, I consider some other costs that could undermine the argument.

So far, I have presented an argument for legal age change. According to the argument, age change would be a way to prevent, stop or reduce ageism, discrimination based on (old) age. Next, I consider some immediate objections against the view that people should be allowed to change their legal age. I show that the objections are lacking argumentative power.

Potential objections and replies

In this section, I respond to possible objections against the view that people should be allowed to change their legal age. Some of the replies are mere clarifications of my position and others are more fulsome responses to deeper objections.

Objection 1. Age is a biological fact that cannot be changed. Biological age equals chronological age. Age change should not, therefore, be allowed because it is impossible.

Reply. This objection is misplaced. I do not deny the existence of chronological age, the period of time a person has been alive and existed. It would be impossible to change this age. But, besides this chronological age, there are other ages such as emotional and biological age. There is nothing logically implausible in changing legal age, while it might be implausible to change biological or chronological age.[94]

This objection is not compelling for another reason. The claim that a person's biological age always corresponds with his chronological age is false. People age at different rates. People's body parts also age at different rates, and how fast our cells deteriorate depends on various factors, including genetics, epigenetics and lifestyle. To illustrate this, consider two fictional but plausible cases.

> Alan (chronological age of 50) drinks and smokes heavily, does not exercise, eats unhealthily and has a stressful job. Alan visits a doctor for a medical check-up. The doctor examines Alan and tells him that his body is that of a 60-year-old man.

[94] Many people, of course, make significant efforts to keep themselves biologically young and try to stop or slow down ageing. Philosophers and bioethicists, likewise, put forth and evaluate arguments for the views that we should prevent ageing or even death. See for example Bostrom (2005) and Minerva (2018).

> Bob (chronological age of 50) does not smoke or drink, exercises, eats healthily and has a less stressful job. Bob visits a doctor for a medical check-up. The doctor examines Bob and tells him that his body is that of a 40-year old man.

While the chronological ages of Alan and Bob are both 50 years, Alan's biological age is 60 while Bob's biological age is 40. Thus, biological age does not always correspond with chronological age. This has been confirmed by medical research. For example, major depression has been associated with higher epigenetic ageing in blood as measured by DNA methylation (DNAm) patterns. As the researchers of this recent study (Han et al. 2018) stated: 'As compared with control subjects, patients with major depression exhibited higher epigenetic aging in blood and brain tissue, suggesting that they are biologically older than their corresponding chronological age.'

Objection 2. An old person should not be allowed to change his age to younger because he might endanger himself and others at the workplace. Age change would thus have excessive consequences and because of that, the third premise is mistaken.

Reply. This objection fails. It is true that in general, age limits exist for good reason, such as prohibiting a 90-year-old from become an airline pilot because he would pose a safety risk. Nevertheless, if by medical and psychological examination it is possible to determine that a person's biological and psychological age are significantly lower than his chronological age then such a person would not be a safety risk at a workplace. Even if this objection were successful, it would merely show that in *some* cases age change should be prohibited, not that it should be prohibited in *all* cases, because not all old people pose safety risks and not all jobs are of the sort where people's lives might be in danger. On the other hand, if one claims that an old person poses a safety risk *because* of his old age and *despite* his physical and psychological abilities, the objector merely expresses his own ageism.

Objection 3. Age change is expensive for the societies, at least if it becomes reasonable common and every age change candidate needs to be individually tested and evaluated by medical doctors and psychologists. Third premise is therefore false and due these excessive reasons, age change should not be allowed.[95]

Reply. The objection somewhat misses the goal because it is an objection against the view that age change should be publicly funded and it is not obvious that it should. Healthcare rationing is inevitable because of limited resources. If the process of age change would be very expensive, the state could demand the applicant to cover the costs of age change himself. It is worth noting that to

[95] I thank anonymous referees at the *Journal of Medical Ethics* for pressing me on this one.

the society, changing age would at least in some cases be beneficial (such as when a person would stop collecting government retirement benefits and go back to work instead). Therefore, in some cases, the state would also have an interest to endorse age change policy because of cost-benefit analysis.

Objection 4. Someone changing his legal age older could have psychological problems because the person cannot know how it would feel like to be acknowledged as olderbecause he has not been that old before. Thus, changing one's age could be psychologically dangerous and therefore it should be prohibited.

Reply. If successful, this objection shows that age change should be prohibited when a person wants to change his legal age to older, not when a person wants to change his age to younger. Persons who want to change their legal age to younger, such as Emile Ratelband, have been younger before, therefore they know what it feels like. Changing legal age to younger is not a jump into the unknown – it is to match a person's legal age with his emotional and biological age and to acknowledge the lived experience of the person.

Nevertheless, while I admit that changing age might in some cases be a 'transformative experience' (Paul 2014), so that age change would have an effect on the sort of person we will be, this is not a reason to oppose age change. After all, there are many choices and decisions that are transformative in this way (such as whether one will have children, see Paul 2015), but it seems they should still not be prohibited because in human life it is inevitable to face choices that transform us.

Objection 5. If people should be allowed to change their legal age then people should be allowed to change, for example, their legal height as well. But this cannot be right; therefore people should not have a right to change their legal age either. In fact, the existence of this article supports the claim that legalizing sex change has led to demanding the legalization of age change, and similarly age change might lead to height change.

Reply. This slippery slope argument comes in two forms: causal and logical (Corvino 2005). According to the causal version of the argument, legalizing age change would be a path to legalizing height change as well. Because we should not allow people to change their legal height, we should not allow people to change their age either.

The problem of the causal version of the objection is that there is no evidence to suggest that legalizing age change would be the cause (or part of it) in legalizing height change. In fact, the evidence shows the opposite. For example, legalizing sex change has not led to legalizing race change or age change – despite the existence of this article (or the article defending race change,

see Tuvel 2017). The problem thus is that the legalization of sex change or age change does not *cause* the other. A third factor causes them both. This third factor could be, for example, the belief that people should be free to choose their identity when they do not harm others and when they would otherwise face discrimination.

The other form of the slippery slope argument is the logical one. According to this objection, the principles behind age change and height change are the same and therefore we should prohibit both. The argument, as this objection claims, proves too much because we do not want to permit height change, and because the same principles support age change and height change we should jettison those principles.

It is true that people might also be discriminated against due to their height, and the avoidance of discrimination would thus form a prima facie argument for height change. However, while there is a categorical difference between biological age and chronological age, there are no such categories with height. Legal height corresponds with biological height, and obviously, there is no chronological height so the argument presented here does not imply allowing height change.[96]

Objection 6. If people were allowed to change their legal age then people might misuse this option. For example, someone might change his legal age to older so that he would avoid the duty to work and he would be able to collect retirement benefits instead. Because of the possibility of misusing age change, it should not be an option in the first place.

Reply. I have argued that people should be allowed to change their legal age when they genuinely feel their emotional age does not correspond with their chronological age (and when they fulfil the other conditions mentioned). If someone wants to change his age merely to misuse this option, he would not satisfy this criterion. Age change should not be done lightly. Psychologists and medical doctors should be consulted to find out how serious an age change candidate is and what motivations he has for the age change. I doubt that the risk of misuse is so serious that legal age change should not be allowed at all.

[96] An anonymous referee at the *Journal of Medical Ethics* suggested that there could be something like functional height, i.e. one could identify herself taller than she is and who could also capable of doing many of the things taller people are able to do because they jump well or manage to compensate their height another way. So while it would be a slightly different argument (and something supporter of age change could reasonable contest), height change might be worth considering as well.

Conclusion

In this paper, I have framed an argument for legal age change and considered objections against it. I have argued that in some cases people should be allowed to change their legal age. Such cases would be when the person genuinely feels his felt age differs significantly from his chronological age *and* the person's biological age is recognized to be significantly different from his chronological age *and* age change would prevent, reduce or stop ageism, the discrimination due to age, he would otherwise confront.

I have not offered a full account on when age change should be allowed, but if I am right, there are cases where age change should be allowed. It is up to further studies to determine the exact conditions for legal age change.

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Further defence of legal age change: a reply to the critics

Abstract

In 'Moral case for legal age change', I argue that sometimes people should be allowed to change their age. I refute six immediate objections against the view that age change is permissible. I argue that the objections cannot show that legal age change should always be prohibited. In this paper, I consider some further objections against legal age change raised by Iain Brassington, Toni Saad and William Simkulet. I argue that the objections fail to show that age change should never be allowed.

Introduction

In 'Moral case for legal age change' (Räsänen 2019), I claim that sometimes people should be allowed to change their age, I consider six objections (1–6) against legal age change and find them lacking. Iain Brassington (2019), Toni Saad (2019) and William Simkulet (2019) have proposed further objections against legal age change.

In this paper, I respond to the following counter-arguments my critics have raised: age change should not be allowed because 7) there are better ways to fight ageism than age change, and 8) age change is lying and one should not lie in official documents.

More objections against legal age change and the replies

Iain Brassington and William Simkulet both raise the following objection against legal age change.[97]

Objection 7. Ageism is not a reason to allow age change but a reason to require that age is not asked while recruiting employees. Age change should not, therefore, be allowed because there is an easier way to solve the problem of discrimination: restricting access to one's birthdate.

Reply. Restricting access to one's birthdate is not a better way to fight ageism. In fact, at least in some ways, it is *worse* than age change. There are two ways in which hiring could be arranged without revealing candidates' ages but they are both unsatisfying.

According to the first option, revealing one's age in a job application would be optional but not mandatory. If one does not want to reveal her age, employers should not demand that. But this

[97] See the first six objections against legal age change which I considered and refuted in 'Moral case for legal age change'.

option is not helpful for someone who is being discriminated against due to her age. If one were not to reveal her age, that might signal the person has something to hide – her (old) age – and therefore, the person who would otherwise face discrimination because of her age would now face discrimination because of not revealing her age. Thus, hiding the age solves nothing.

The second option is to prohibit everyone from revealing their ages in job applications to ensure that no-one can be discriminated against because of age. This option might reduce discrimination but the cost is too high. Age is an important part of people's identities. If we do not allow people to reveal their ages to others, we are committing a serious moral wrong because we are restricting their freedom on something that matters to them greatly. It is better to allow some people to change their age when it does not harm or restrict the freedom of others than to restrict the freedom of all by forcing everyone to hide their age.

Simkulet claims that if age change is allowed it is sometimes child's play to determine a person's chronological age; for instance when a person graduated from college before she was legally born. But this remark simply shows that age change is not always a perfect solution; it does not show that age change cannot sometimes be a reasonably good choice.

Objection 8. Changing age is lying because it would require changing the birthdate in the identification documents. However, people should not lie in identification documents; therefore, age change should not be allowed. This objection, raised by Toni Saad, states that age change is a form of nihilism that should not be allowed because it involves falsifying the record of one's date of birth.

***Reply*.** We are interested in people's date of birth (almost) solely because that makes us able to count how old people are. For instance, if a young-looking fellow is buying alcohol and the waitress wants to see his ID, she is not primarily interested to see whether the person is born in May or December or on the first or the last day of the month. She wants to see the date of birth only because her primary interest is to find out whether the person is over 18 (or whatever the legal age for buying alcohol) and she does that by counting the age based on his birthdate and the current date.

With modern technology, we could fairly easily move to use a system of digital IDs where our passports and driver's licences would be just applications on our smartphones. One could, therefore, have his age showing in the identification app directly rather than showing the birthdate. This would make the task a bit easier for clerks, waitresses, border guards and all others who might be interested in our age because they would not have to make the calculations in their heads.

This ‘age’ in mobile IDs would make it possible for legal age to correspond with biological age (instead of chronological age), for those who have reasons to match their age that way, without falsifying records or lying in the ID – because there would be no date of birth in the ID.[98]

I have a feeling that Saad, and others raising this objection, would have difficulty accepting that age change could be allowed in cases where our ID’s were just apps on our phones that had ‘age’ instead of ‘date of birth’, while denying that age change should ever be allowed with the current system. Therefore, I believe that the opposition against legal age change is not really based on the claim that after age change, the birthdate in the ID would not correspond with the person’s actual date of birth.

Concluding remarks

My critics claim that the terms I use are problematic. Saad would prefer physiological age instead of biological age, Simkulet would rather speak of physical and emotional maturity and Brassington seems to deny the existence of biological age altogether.

Simkulet criticises my definition of biological age because it includes both the age of one’s body and the age of one’s mind. However, there is a reason for this. There is an extremely rare genetic disorder called progeria, which causes rapid ageing. While a child with progeria suffers symptoms generally absent in the non-elderly population, his mental development is very similar to a healthy child. Progeria children should not be allowed to legally change their age into the elderly despite their physical condition because they are mentally children. This ‘real-life thought experiment’ shows that although one’s body is biologically older than one is chronologically, it is not a sufficient criterion for legal age change.[99]

While I added mental development in the definition of biological age to exclude progeria patients, I did not pull the concept of biological age like a rabbit out of a hat. Although there is no consensus on how exactly biological age should be measured, it is a commonly used term in geriatrics, and biological age is at least as widely used as physiological age (Mitnitski et al. 2002).

[98] This would not work if one were to deny that ‘age’ can refer to anything other than chronological age. But it can. Consider Scotch whiskey bottled ten years ago after maturing 21 years in a cask. The age of the Scotch is still 21 years. But if, despite my argumentation, one stubbornly claims that ‘age’ *is* ‘chronological age’ and nothing else, I probably cannot convince them to believe that people should be allowed to change their legal age. To use an analogy, I cannot convince someone to accept same-sex marriage if they keep saying: “marriage *is* marriage between different sex couples, and nothing else, because marriage is precisely that.”

[99] Some might not be sure how to think about age or (age change) when it comes to progeria children. Such people could consult their intuitions after watching a documentary movie *Life According to Sam*, which is based on the life of Sam Berns, a boy suffering from progeria.

Different calculations, such as frailty index (Goggins et al. 2005), have been proposed to define biological age, and according to a research group from Sweden, new indicators of biological age (such as epigenetic clock) are also emerging (Jylhävä et al. 2017). Therefore, I am inclined to side with Arthur Caplan that science will one day come up with an objective measure of ageing (Kirkey 2019). Until that, biological age should simply be an estimate that would form the base of legal age change.

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Age change in healthcare settings: a reply to Lippert-Rasmussen and Petersen

Abstract

Kasper Lippert-Rasmussen and Thomas Søbirk Petersen discuss my 'Moral case for legal age change' in their article 'Age change, official age and fairness in health'. They argue that in important healthcare settings (such as distributing vital organs for dying patients), the state should treat people on the basis of their chronological age because chronological age is a better proxy for what matters from the point of view of justice than adjusted official age. While adjusted legal age should not be used in deciding who gets scarce vital organs, I remind the readers that using chronological age as a proxy is problematic as well. Using age as a proxy could give wrong results and it is better, if possible, for states to use the vital information directly than use age as a proxy.

Introduction

In 'Moral case for legal age change' (Räsänen 2019a), I proposed that people who are discriminated against because of their age should be allowed to change their legal age (date of birth) to match it with their biological or emotional age, instead of chronological age, to avoid the discrimination.

Kasper Lippert-Rasmussen and Thomas Søbirk Petersen (2020) discuss my proposal and form their own 'official age argument' – which they eventually reject. They claim that chronological age is a better proxy for what matters from the point of view of justice than adjusted official age, therefore, at least in important healthcare settings (such as distributing vital organs for dying patients), the state should treat citizens based on their chronological rather than their (changed) official ages. The kernel of their idea is this: when deciding whose life we should save (and when we cannot save the lives of all), chronological age should be used as a decision making criteria, because it, allegedly, corresponds well with how many good years one has lived.

While I agree with their idea in general, I remind my critics and readers that in healthcare settings, it is problematic to use proxies in the first place because it might give us wrong results.

Age change in healthcare settings

I framed, and defended (Räsänen 2019b), my argument for legal age change as follows (slightly revised in light of criticism from Brassington 2019):

P1) Legal age is a cause of severe discrimination for some people whose biological and emotional age do not match their chronological age.

P2) People should be allowed to secure relief from severe discrimination against them unless this has excessive consequences.

P3) Changing a person's legal age would not, in the case of people whose biological and emotional age do not match their chronological age, have excessive consequences.

P4) Changing a person's legal age secures relief from discrimination.

C) People whose biological and emotional age do not match their chronological age should be allowed to change their legal age in order to secure relief from discrimination.

Lippert-Rasmussen and Petersen frame a slightly different argument for the same conclusion and argue against the third premise of it. They claim that if the state were to set healthcare priorities on the basis of adjusted official age (*legal age* in my argument) it would amount to injustice, and so, age change would have excessive consequences; which makes the argument unsound.

They ask the reader to consider a situation where people have changed their official age and are in need of vital organs.

> A number of scarce lifesaving organs must be distributed by a public healthcare system among two groups of patients. Everyone has the official age of 50. However, members of the first group have the chronological age of 70, while members of the second have the chronological age of 40. Suppose that everyone will enjoy an extra 10 good life years if they receive an organ. Members of the first group have enjoyed 30 more good life years than members of the second group, and that is relevant for who should receive the available organs, justice-wise. Even if a member of the second group were to receive an organ, she would still not have enjoyed as many good life years as members of the first group.

Here, chronological age is used as an approximate substitute, an indicator of how many good life years one has lived. I agree, as I think most people would, that it would be unjust to give the vital organs to those who have lived longer. Lippert-Rasmussen and Petersen say that the claim that the members of the first group have enjoyed 30 more good life years than the members of the second group is relevant on a wide range of different accounts of justice in healthcare. If justice requires equalizing bad brute luck across patients, generally, we should give priority to young over old (Segall 2010); if we should give priority to the worse off, the same follows (Parfit 1998); and if justice requires that everyone enjoys a sufficient number of good life years, then again chronological age should be taken into account (Harris 1970).

Be that as it may, if we have more relevant information available, we might think differently. For instance, consider the following situation.

> A vital lifesaving organ must be distributed by a public healthcare system among two patients. Both patients have the chronological age of 50. However, the first person has been in a coma for the past 30 years and just woke up, while the second person has enjoyed 30 good years during that time. Suppose that both would enjoy an extra 10 good life years if they received an organ. The second person has enjoyed 30 more good life years than the first person, and that is relevant for who should receive the available organ, justice-wise. Even if the first person were to receive an organ, she would still not have enjoyed as many good life years as the second person.

Now, when we have more information available (how long the people actually have been conscious and enjoyed their lives) our intuitions, correctly, change. Here, it seems unjust, to deny a lifesaving organ from a person who has just woken up from a coma. Now, the same accounts of justice in healthcare align with this intuition. If justice requires equalizing bad brute luck across patients, we should give priority to the ex-coma patient (supposing she fell into a coma for no fault of her own) over the other patient; if we should give priority to the worse off, the same follows; and if justice requires that everyone enjoys a sufficient number of *good* life years, then again the ex-coma patient should be given priority.

What the case shows is that chronological age does not necessarily correspond well with how many good life years one has lived.[100] Chronological age, therefore, is not necessarily a good guide when we make decisions on who should get vital organs, although it might be, in general,

[100] Lippert-Rasmussen and Petersen agree here; personal correspondence with Lippert-Rasmussen.

a better proxy than biological age. Age is often used as a proxy; for example, in insurance, on the labour market, and family, criminal and electoral laws (Gosseries 2014). Using age as a proxy has both advantages and disadvantages. One disadvantage is that the correspondence between age and the characteristic for which it stands is not often based on evidence but on stereotypes and generalizations (Neugarten 1981).

My point is not to deny the claim that chronological age is a better proxy than biological age in the context of allocating lifesaving transplants. It is. My point is that it is unjust for the state to rely on proxies if more vital and accurate information is available. In the context of allocating scarce organs such information would include, for example, whether the person was wrongfully convicted to prison for years and therefore couldn't live his life fully or whether he has been in a coma for a decade or so. It might even be that someone suffering from many years of clinical depression should receive vital organs, although chronologically younger than others on the organ donation list, because she has enjoyed fewer good life years.[101]

In the case that Lippert-Rasmussen and Petersen raised, the reason why one group of people should get priority for the organs over the other is not that they have existed longer but because they have enjoyed more good life years – which often but not always corresponds well with chronological age.

Conclusion

I agree with Lippert-Rasmussen and Petersen that in important healthcare settings the state should treat people based on their chronological age rather than official age, when it should treat patients (partly) based on age, but only if the state cannot easily access the more vital information directly (whether one has been in a coma, clinically depressed, wrongfully convicted etc. that has made her unable to enjoy her life).

Lifesaving organs are scarce. If a person gets one, someone else doesn't. But in the job market, where discrimination is perhaps the most pressing, one person's gain is not another's loss. So while legal age change has been hit, it is not down.

[101] It could be that there are practical reasons, such as high costs of obtaining detailed information about people's lives, that make the use of proxies inevitable.

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