The principle of genomic liberty

Tsvi Benson-Tilsen, 19 March 2025

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Summary

The world will soon use human germline genomic engineering technology. The benefits will be enormous: Our children will be long-lived, will have strong and diverse capacities, and will be halfway to the end of all illness.

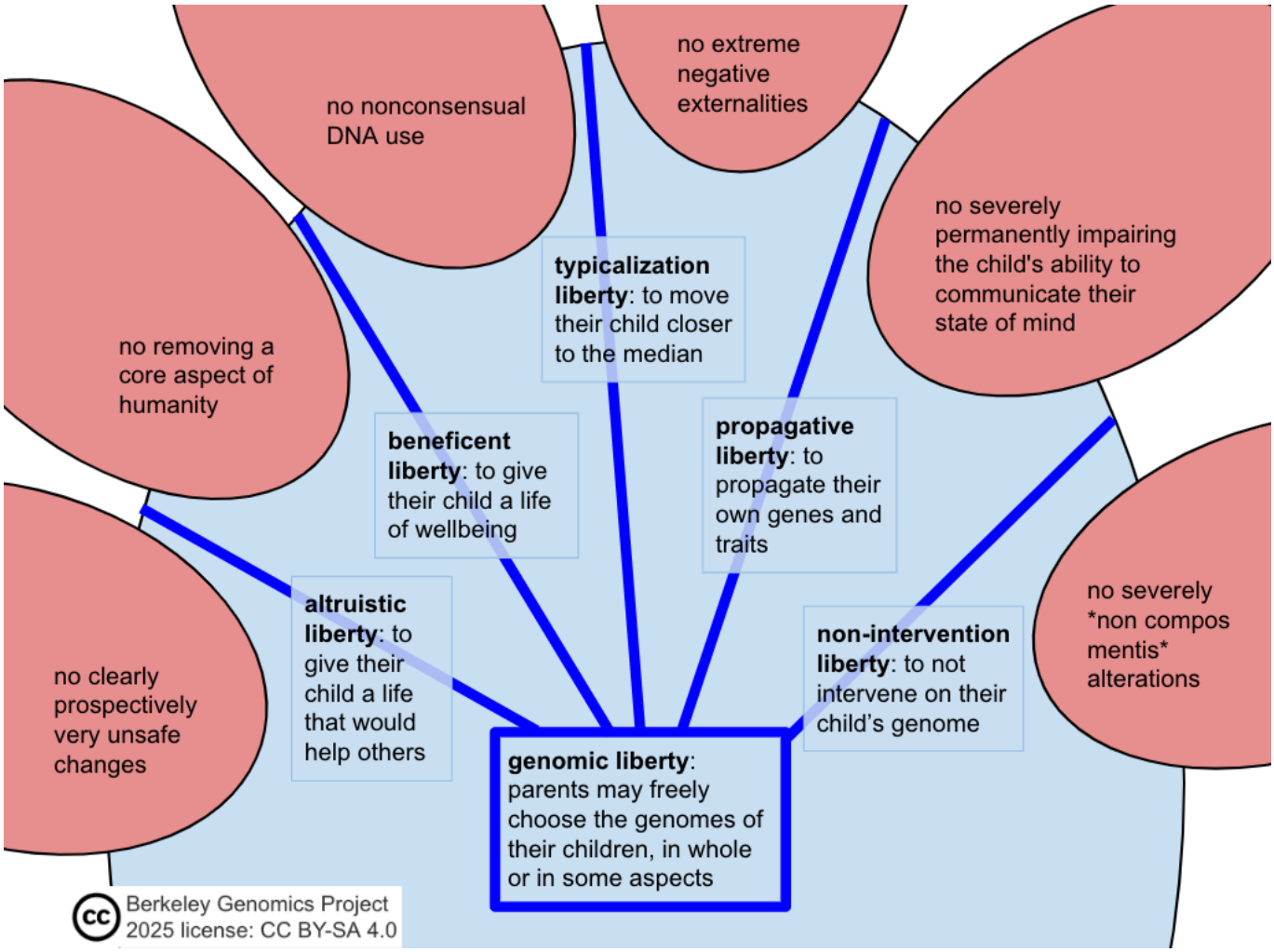
To quickly bring about this world and make it a good one, it has to be a world that is beneficial, or at least acceptable, to a great majority of people. What laws would make this world beneficial to most, and acceptable to approximately all? We'll have to chew on this question ongoingly.

Genomic Liberty is a proposal for one overarching principle, among others, to guide public policy and legislation around germline engineering. It states:

> Parents have the right to freely choose the genomes of their children.

If upheld, genomic liberty protects the rights of parents from regulation by the state.

A visual summary of the more detailed structure of the principle of genomic liberty:



The principle of genomic liberty has several potential exceptions. These cases aren't strongly protected by genomic liberty, and therefore could potentially be regulated while upholding genomic liberty:

- Genomic choices that are clearly prospectively very unsafe.
- Genomic choices that remove a core aspect of human nature.
- Genomic choices with extreme negative externalities on other citizens.
- Nonconsensual use of someone's DNA.
- Genomic alterations chosen by parents who are severely *non compos mentis*.
- Genomic choices that would severely permanently impair the child's ability to communicate their state of mind.

Within the principle of genomic liberty, there are tentpole principles that apply to a narrower set of cases, but that give stronger protection against regulation. These tentpole principles help to clarify genomic liberty, and to fortify it against inappropriate regulation:

Non-intervention liberty. Parents have a very strong right to not genomically intervene on their child, in whole or in any aspect.

Propagative liberty. Parents have a strong right to propagate their own genes and their own traits, in whole or in some aspects.

Typicalization liberty. Parents have a strong right to move their future child closer, in expectation, to the median value of one or more traits.

Beneficent liberty. Parents have a strong right to make well-informed genomic choices that a reasonable person would agree are aimed at giving their child a life of wellbeing.

Altruistic liberty. Parents have a strong right to make well-informed genomic choices that a reasonable person would agree are aimed at giving their child a life that would contribute to the wellbeing of others.

The remainder of the article expands on this summary.

My hope is to start a conversation in which we seriously envision this coming world and think about how to make it a good one.

Statement of the principle

To restate the principle of genomic liberty a bit more precisely:

> Human parents have the natural right–a negative right against infringement on liberty by the state and society–to freely choose the genomes of their human children, in whole or in some aspects.

The principle of genomic liberty isn't saying that any specific choices you might make about your child's genome are morally good or bad. Rather, genomic liberty is a political principle, like the principle of the freedom of speech. It says that parents are, by right, the primary decision-makers about the genomes of their own children. Therefore, states should ensure that parents have wide, protected latitude within the law to influence the genomes of their children, in whole or in some aspects, if they wish. Anomaly, Gyngell, and Savulescu (2020)[1] suggest applying "regulatory parsimony"[2] to the question of regulating genomic choices; to some extent this agrees in spirit with the regulatory stance mandated by the principle of genomic liberty.

(For more elaboration on the nature of the principle, see the appendix "Genomic liberty is a political principle".)

Like any principle, genomic liberty is not simple and absolute. It competes with other principles and practicalities, and therefore it has exceptions which have to be carved out. In order to be strongly upheld as a right, genomic liberty should be protected by clarifying and codifying its concrete instances. That is the aim of the rest of this article.

Disclaimers

I know next to nothing about law and public policy. So this article is speculation from a layman's perspective, and might therefore contain obvious blunders. I am out of my depth, here; and I've felt conflicted about several of the points proposed here. My opinions will change.

My hope with this proposal is to nucleate discussion and eventually lead to better thought-out policies. This proposal only even attempts to partially address one element–the overarching public policy principles–out of many elements of a good future societal stance towards germline engineering.

This article is not mainly meant to make the case for genomic liberty, and does not present an overall argument. It is mainly meant to present a proposal for what the principle of genomic liberty should mean in the first place. I do make some arguments, mainly in order to explain why this proposal is specifically the way it is, rather than being some other similar proposal.

This article is produced by precautionary foresight about a technology and societal situation that does not exist yet. Therefore, it is not well-grounded in empirical observation of the outcomes in question or in the practicalities of law and law enforcement. Also, it will focus on difficult and in many cases somewhat alarming scenarios, in order to deal with them; but remember that, by and large, the technology will be greatly beneficial to the great majority of users making free, reasonable enough choices.

Analogy: First Amendment rights

Consider, for comparison, the principle of the freedom of thought. This principle is codified in the First Amendment of the US constitution:

> Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances[3].

The throughline of the First Amendment rights is freedom of thought. James Madison, in his address to the House of Representatives introducing a draft Bill of Rights, even suggested as part of religious protections the further protection for moral beliefs in general: "[…], nor shall the full and equal rights of conscience be in any manner, or on any pretext infringed."[4].

Although freedom of thought is a cherished keystone of free and open societies, it is far from absolute. Many people take quite strong stances defending freedom of speech, but nevertheless, almost everyone agrees that some kinds of speech should be prohibited. (Of course, there is disagreement about where to draw the line between protected and unprotected speech.)

Here's a schematic depicting this situation. The light blue oval is freedom of thought, which is protected under the First Amendment. The red ovals are some of the exceptions to freedom of thought.

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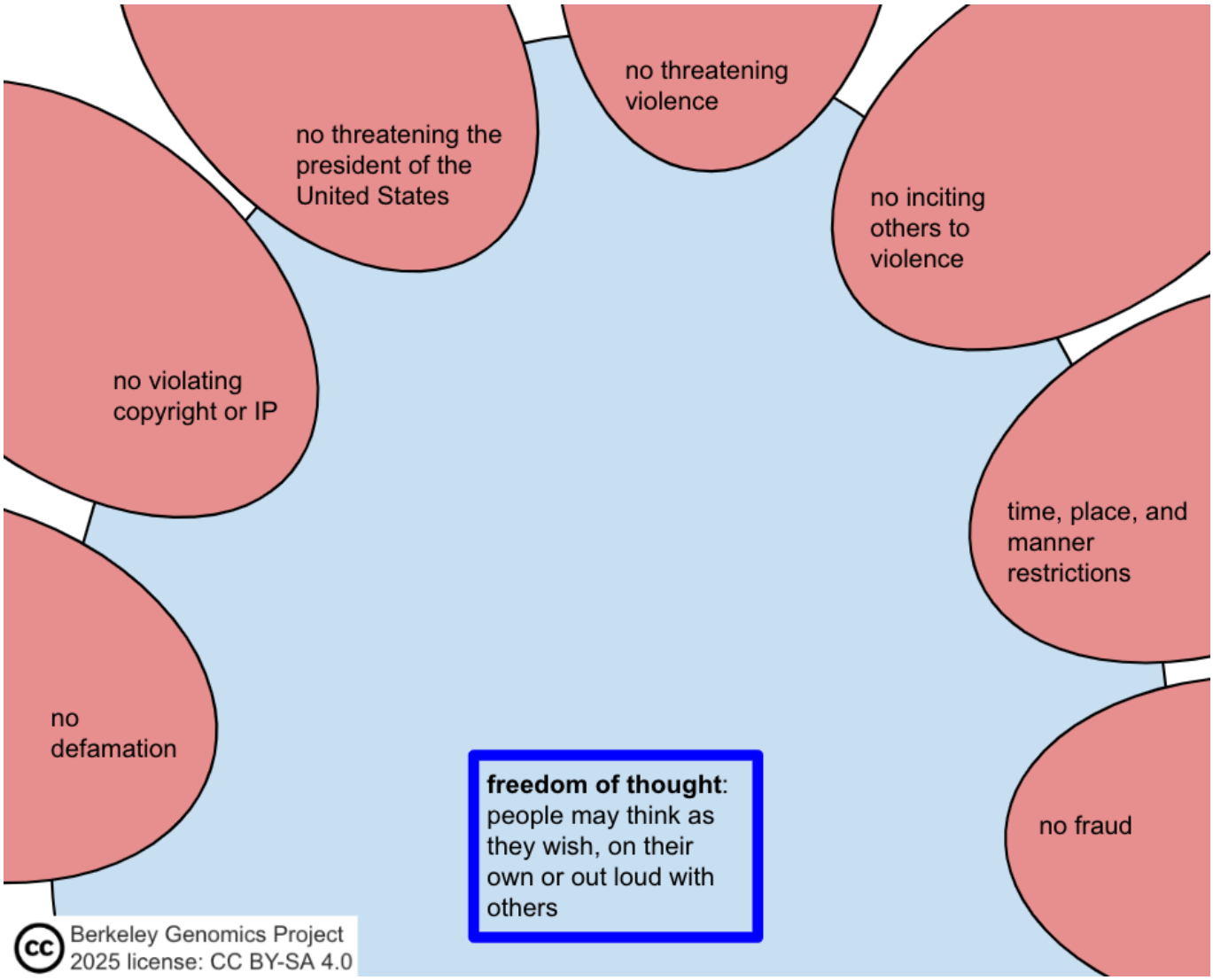
[1] Anomaly, Jonathan, Christopher Gyngell, and Julian Savulescu. 'Great Minds Think Different: Preserving Cognitive Diversity in an Age of Gene Editing'. Bioethics 34, no. 1 (January 2020): 81–89. https://doi.org/10.1111/bioe.12585.

[2] Gutmann, Amy. 'The Ethics of Synthetic Biology: Guiding Principles for Emerging Technologies'. Hastings Center Report 41, no. 4 (2011): 17–22. https://doi.org/10.1002/j.1552-146X.2011.tb00118.x.

[3] 'U.S. Constitution - First Amendment | Resources | Constitution Annotated | Congress.Gov | Library of Congress'. Accessed 16 March 2025. https://constitution.congress.gov/constitution/amendment-1/.

[4] 'Founders Online: Amendments to the Constitution, [8 June] 1789'. University of Virginia Press. Accessed 16 March 2025. http://founders.archives.gov/documents/Madison/01-12-02-0126.



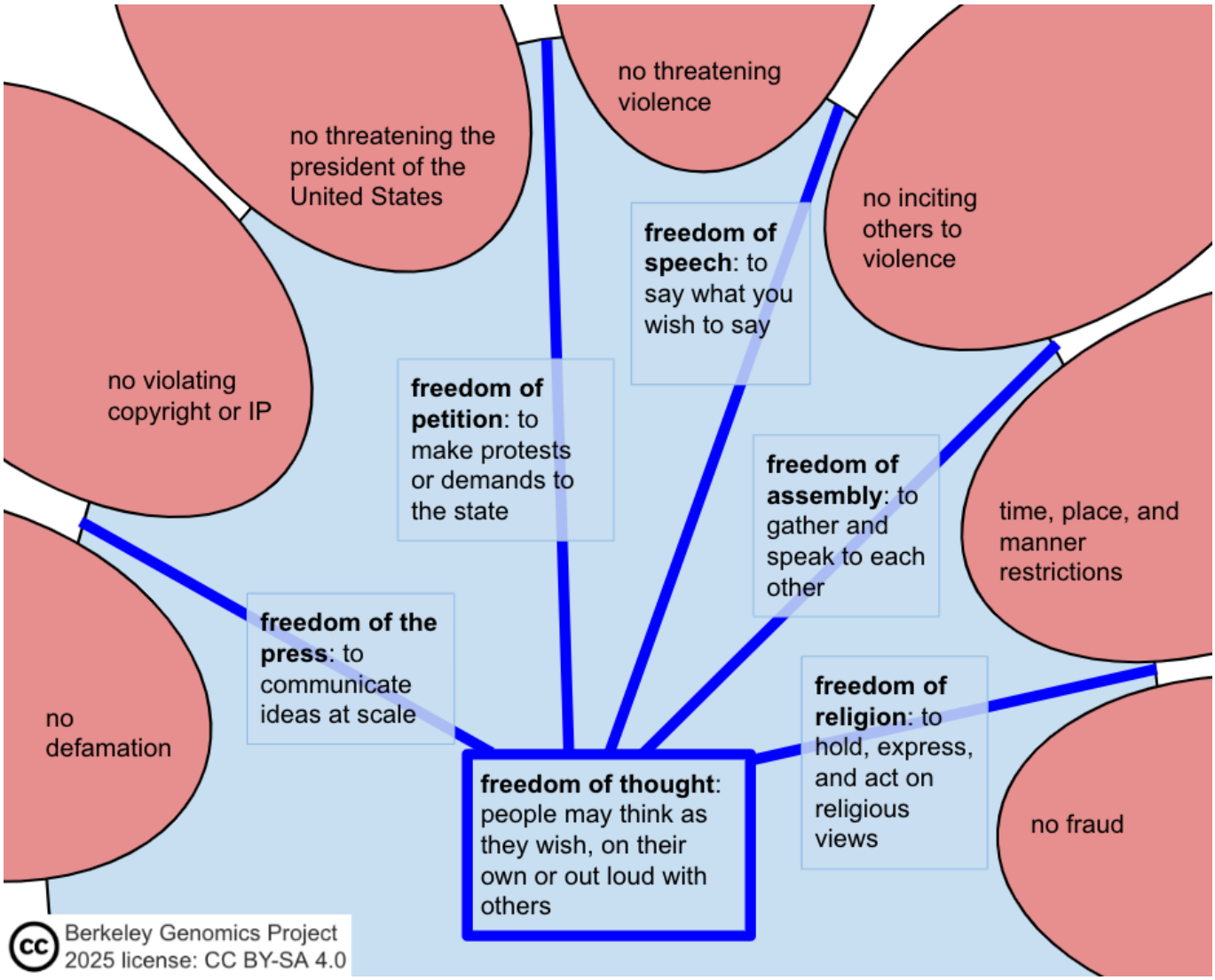
The text of the First Amendment lists several rights: to religion, speech, press, assembly, and petition. Why list all these rights, instead of just a single right? Maybe the First Amendment could have read simply:

> Congress shall make no law prohibiting or abridging the free exercise of thought, whether by individuals or groups.

Madison explains why there are rights being explicitly declared at all:

> In the declaration of rights which [Great-Britain] has established, the truth is, they have gone no farther, than to raise a barrier against the power of the crown; the power of the legislature is left altogether indefinite. Altho' I know whenever the great rights, the trial by jury, freedom of the press, or liberty of conscience, came in question in that body, the invasion of them is resisted by able advocates, yet their Magna Charta does not contain any one provision for the security of those rights, respecting which, the people of America are most alarmed. The freedom of the press and rights of conscience, those choicest privileges of the people, are unguarded in the British constitution.

The rising and falling tides of legislative sentiment will probe the inlets to our rights. The precious rights therefore have to be defended most strongly in those places. Freedom of thought may have been a leitmotif in the American spirit, but to be a strong right, it needed to be codified as more concrete tentpole freedoms:



These tentpole principles, enumerated in the First Amendment, are more narrow than a broad freedom of thought, but they are more clear and more strong. They are placed strategically where there may be a motive from legislators to restrict freedoms, and they protect some of the most important aspects of freedom of thought.

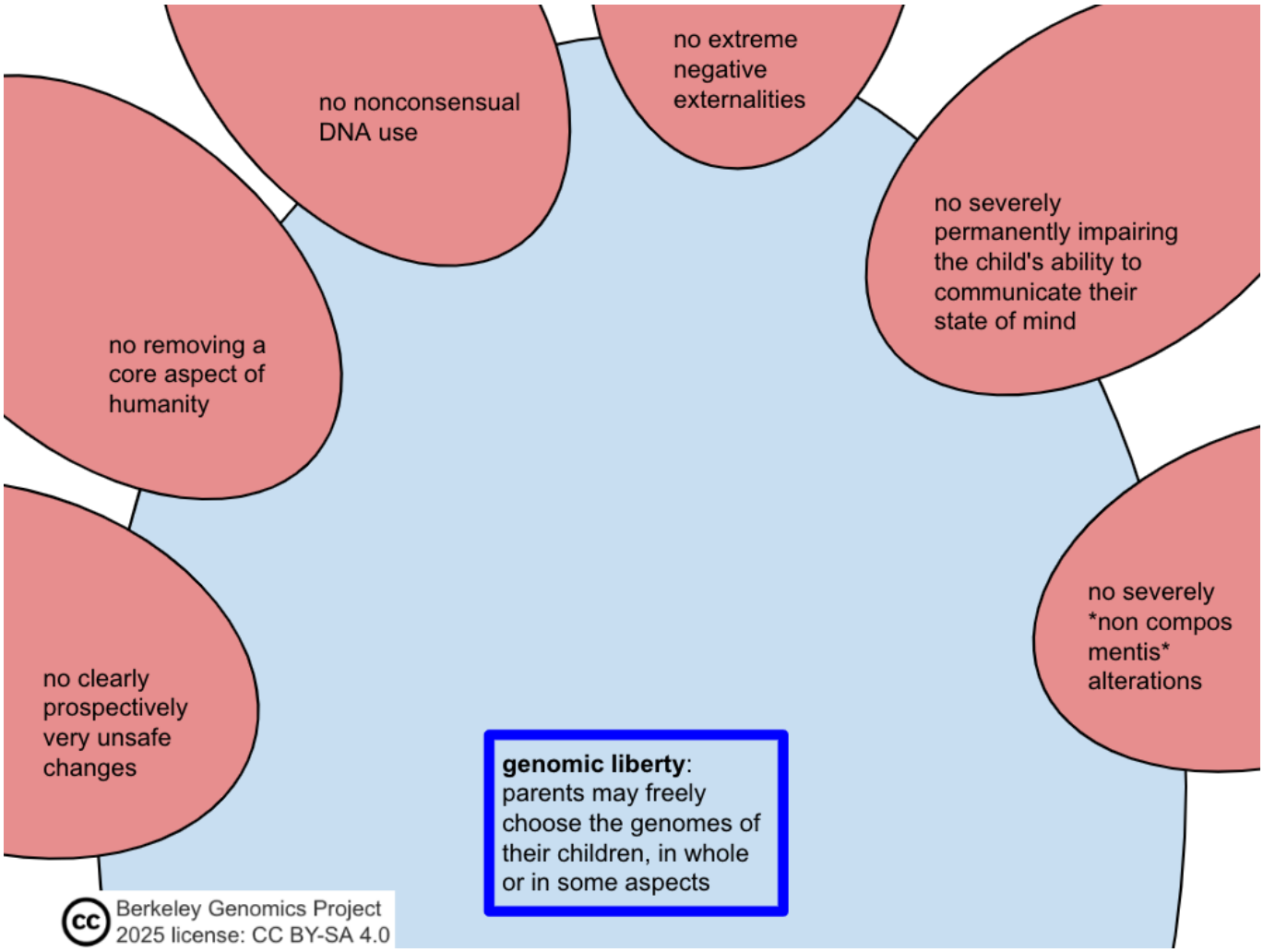
Exceptions to the genomic liberty principle

As with the First Amendment, genomic liberty will have exceptions. The existence of exceptions is compatible with the principle being strong. Part of clarifying the strong core of genomic liberty is the task of circumscribing it by explicitly accepting limitations on its purview of protection. What remains unexcepted is the core domain of the GL principle, which is to be strongly upheld and applied to prevent inappropriate regulation.

The following list gives some recognized exceptions to genomic liberty. These genomic choices can be banned without inappropriately contravening the genomic liberty principle.

Summary of exceptions

A schematic summary of the exceptions:



Elaboration on the list of exceptions:

Prospectively very unsafe

Potentially regulatable: **Genomic choices that are clearly prospectively very unsafe.**

- Example: Traits far outside the human envelope of variation. For example, if a man grew to be 10 feet tall, he would be very ill and he would die.
- Example: Extreme traits with extremely bad effects. For example, making someone with an extremely high risk of schizophrenia and major depression.
- Example: Large alterations with no empirical validation that they are safe. For example, making a genome with many alleles that do not appear in any other humans.

Substantively impinging on humanity

Potentially regulatable: **Genomic choices that remove a core aspect of human nature.**

- These might for example be banned in order to preserve human dignity.
- What exactly a core aspect of human nature is would be a difficult question to answer, but some examples: emotions (fear, guilt, love), dependence on other people, language, consciousness and self-awareness, moral conscience, a sense of fun and play, curiosity, empathy, memory.

Extreme negative externalities

Potentially regulatable: **Genomic choices with extreme negative externalities on other citizens.**

- Example: It would plausibly be acceptable to ban parents from making a child who is $+6\sigma$ (1 in a billion) on disagreeableness and $+3\sigma$ (1 in 600) on unconscientiousness. Such a child would stand a high chance of exhibiting extreme psychopathy[5].
- Counterexample: Parents *should*, given good information, be able to choose to have a child who is $+2\sigma$ (1 in 40) on disagreeableness and $+1\sigma$ (1 in 6) on unconscientiousness. (That personality profile might be enriched with creative genius, so this might be a practical question.) Although that child might have difficulties caused by that genomic choice, some of which affect others, this does not constitute nearly enough of a clear, probable, large externality to justify abridging GL.

[5] Miller, Joshua D., and Donald R. Lynam. 'Understanding Psychopathy Using the Basic Elements of Personality'. Social and Personality Psychology Compass 9, no. 5 (2015): 223–37. https://doi.org/10.1111/spc3.12170.

- Counterexample: A blind couple might genomically choose to have a blind child. This choice might have some modest externalities, e.g. the blind child might need some government assistance at some point. But this possible externality is not remotely enough to overcome the protection of the genomic liberty principle.

Nonconsensual DNA use

Potentially regulatable: **Nonconsensual use of someone's DNA.**

- DNA sequencing and genomic engineering technology could technically enable parents to have a child with a genome that is identical with, or substantially overlaps with, the genome of a third party, perhaps even without ever coming into contact with the third party. This would violate the consent of the third party; their exact genome might be considered their property.
- For example, cloning someone without their permission could legitimately be prohibited.
- If this is regulated, then there's a need for clarity on what this exception means exactly. How much shared DNA is allowed vs. disallowed? How does it depend on the parents's genomes?
  - In particular, the genomic liberty principle says that cloning oneself can't be prohibited.
  - Suppose that some extremely rare genetic variant is found to protect against some disease. It does not seem reasonable to prohibit copying the information in that genetic variant.

Severely *non compos mentis*

Potentially regulatable: **Genomic alterations chosen by parents who are severely *non compos mentis*.**

- There might be parents who are severely cognitively disabled, to the point where they cannot reasonably judge what traits to give their children. It could be acceptable to somehow regulate which genomic choices these parents are allowed to make.
- These parents have a right to have children. This right is separate from genomic liberty, and is already upheld in law, social consensus, and moral understanding.
- This exception is fraught because the state can't necessarily be relied upon to appropriately judge who is or isn't *compos mentis*. Therefore, this exception only applies to cases that meet a very high standard of confidence and of severity.
- Instead of restricting genomic choice, it would be preferable to transfer the authority to make genomic choices to the caretakers of the severely *non compos mentis* parents. Then the rights protected by genomic liberty would be protected as rights of the caretakers.

Permanent silencing

Potentially regulatable: **Genomic choices that would severely permanently impair the child's ability to communicate their state of mind.**

- For example, it could be acceptable to ban genomic choices that would make a future child supranormally obedient, to the point where they are very literally incapable of communicating something they have not been told to communicate. Likewise for choices that would severely impair a future child's ability to understand and use language, or ability to introspect.
- It would be acceptable to ban genomic choices that would, with high probability, make a child who is insufficiently *compos mentis* to coherently understand or communicate their state of mind, e.g. because they are permanently, untreatably, severely schizophrenic or catatonic.
- The reason for this exception is that, if a child's ability to communicate their state of mind is severely impaired, then they can't give testimony about their wishes and well-being.
  - Without that testimony, there may be no reliable way to clearly understand if something very bad is happening for them in their life.
  - A premise of genomic liberty is that when parents make genomic choices about their children, those children will grow up and testify their judgements about their parents's choices. That testimony will allow society to steer toward a general wellbeing for individuals, while allowing for the judgement of wellbeing to be inchoate, diverse, and invested in separate individuals each of whom has a protected voice (freedom of speech and genomic liberty). In other words, if many children who were given some trait say that they would strongly prefer that they hadn't had that trait, then parents, professional self-regulatory organizations, society at large, and potentially the state can take that information into account when dealing with future genomic choices, hopefully in a way that avoids illbeing.
  - Severe permanent impairments to communication and introspection would cut off the flow of testimony, and would break the premise that society will in the long run steer away from illbeing as judged by first-hand testimony.
- Counterexample:
  - Suppose that some parents choose to predispose their future child towards somewhat low conscientiousness, fairly high openness, and somewhat low agreeableness. They might, for example, wish to give their child an increased capacity for artistic achievement, and they might believe (maybe incorrectly) that this personality profile would have that consequence.

  - But this personality profile might hypothetically also substantially increase the risk of the child having bipolar disorder. If the child has severe bipolar disorder, they may at some points have severely impaired communication.
  - While this outcome would of course be a strong cause for alarm and might warrant some additional prohibitions on other grounds, it would not fall under the present exception for severe permanent impairment of communication. In this scenario, the child (or the adult they become) would most of the time be able to reflect on their general experience, wellbeing, and needs; make judgements about their life; and communicate those judgements as testimony to others. This testimony would be sufficient to enable society to make informed judgements about what regulation might be truly necessary regarding genomic choices such as this personality profile.
- Counterexample:
  - Suppose a couple of autistic parents wish to have an autistic child. If they do so, the child has a substantial chance of always having substantive difficulties communicating their mental state in some large category of situations.
  - However, assuming the child is otherwise reasonably *compos mentis*, the child will be able to communicate in some other large category of situations (e.g. with the parents). The impairment, if there is any, would therefore be very unlikely to be so severe that the child's potential testimony is lost. Since restricting this genomic choice would infringe on propagative liberty, and doesn't meet the criteria for the exception about permanent silencing, such a restriction isn't allowed by GL.

Additional notes on these exceptions

- Each of these exceptions says that some laws could be made to restrict specific categories of genomic choices, without violating genomic liberty. But for each exception, it might be unnecessary to actually make any laws that restrict those choices. In some cases, no parents would actually ever make such terrible choices; in many cases, professional norms would prevent reproductive clinics from fulfilling those choices.
- It might be inadvisable to prospectively legislate too many restrictions on genomic choices. A more "wait and see" approach would accord with the principle of regulatory parsimony[6][7].
- This is not an exhaustive list. Some genomic choices not mentioned in this list might empirically be found to have a truly unacceptable outcome, e.g. extreme suffering for the child, some other trait that children reliably come to view as a great harm to them, or some other truly abhorrent result. Those genomic choices might have to be regulated, even if they had not already been recognized as an exception to genomic liberty. We might later find a need for further categories of exceptions; e.g. we might need to specifically prohibit any genomic choices specifically aimed at causing illbeing for a child (e.g. if some parents believe that more suffering is good because it builds character). Like any principle relating to law, genomic liberty will have to accommodate this.

Tentpole principles of genomic liberty

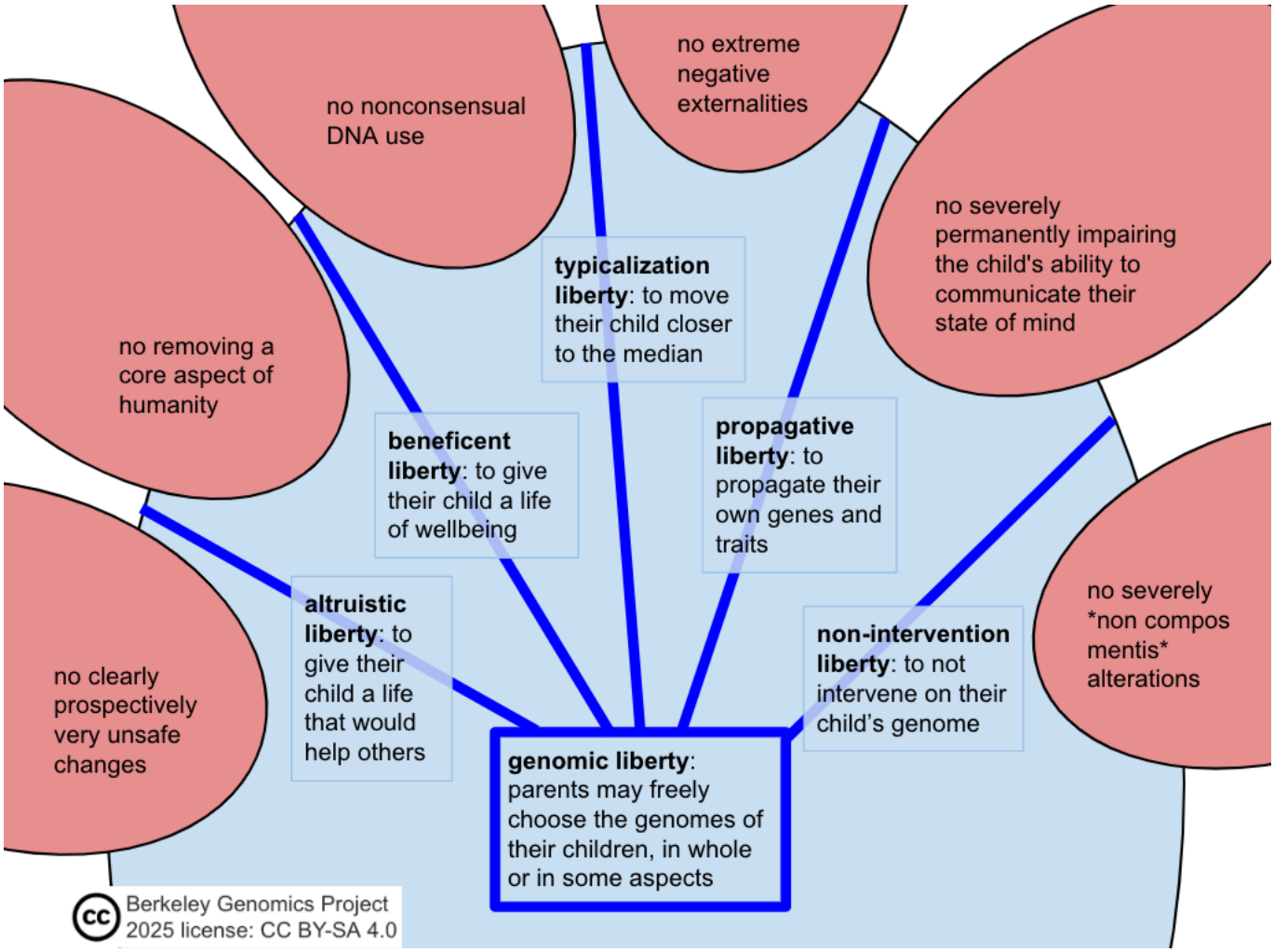
Genomic liberty as a principle of lawmaking will be pushed against: people will try to make laws that restrict genomic choices. Some of those attempts will fall within appropriate exceptions to GL; some of those attempts will be inappropriate, and will have to be combated if the principle of genomic liberty is to be upheld.

The specific protections listed in the First Amendment uphold crucial elements of the general right to freedom of thought. Analogously, in order to weather legislative pushes appropriately, we will shore up genomic liberty with tentpole principles. As is the case with the First Amendment protections, these tentpole protected liberties are not exceptionless; but they are especially strong protections which would require very good reason to encroach upon.

A schematic summary of the tentpole principles that hold up general genomic liberty:

[6] Gutmann, Amy. 'The Ethics of Synthetic Biology: Guiding Principles for Emerging Technologies'. Hastings Center Report 41, no. 4 (2011): 17–22. https://doi.org/10.1002/j.1552-146X.2011.tb00118.x.

[7] Anomaly, Jonathan, Christopher Gyngell, and Julian Savulescu. 'Great Minds Think Different: Preserving Cognitive Diversity in an Age of Gene Editing'. Bioethics 34, no. 1 (January 2020): 81–89. https://doi.org/10.1111/bioe.12585.



Elaboration on the list of tentpole principles:

Non-intervention liberty

Parents have a very strong right to not genomically intervene on their child, in whole or in any aspect.

- In other words, there can be no regulations that require the use of germline engineering to actively alter a future child's genome at all, or in any specific aspect. Parents have a strong right to not use genomic engineering technology, and if they do use it then they have a strong right to not alter any given trait.
- This right may become quite contentious.
  - The use of germline genomic engineering technology will become widespread, institutionally accepted, socially approved, and demonstrably safe.
  - When that happens, there may be many who view it as abhorrent for parents to have children with a substantial risk of a substantively harmful disease, when the parents could have prevented most of that risk using genomic engineering.
  - On the other hand, there may also be many people who view germline genomic engineering as abhorrent, or in any case who do not wish to use it. For example, people with a religious belief that embryos qualify as human life with sacred protections would not accept using technology that involves creating and destroying many embryos. Those same people might feel a religious obligation to have children.
  - There would then be a conflict between the group that says "If you have children, you must use germline engineering to prevent this terrible disease!" and the group that says "We will have children, and we will not use germline engineering.".
- In order to fashion a political compromise that ought to be agreeable to our society, my belief is that parents must have a strongly protected right to not genomically intervene.
- There is one case where I would consider an exception to non-intervention liberty: traits which severely permanently impair the child's ability to communicate their state of mind.
  - I am not sure what to think.
  - On the one hand, it is an extreme and dangerous encroachment on genomic liberty to mandate any genomic alteration. There will be an agreement between those who view germline genomic engineering as abhorrent, and those who wish to use it: If the technology is developed anyway, then at the very barest minimum, the group that's against the technology is guaranteed to never be forced to use it. Any encroachment on non-intervention liberty would betray that agreement.
  - On the other hand, it is unthinkable to make a child who may be suffering and who will never be able to communicate that they suffer. If nothing else, any child in any condition must be able to say to the world, if they judge it so: "My parents made the wrong choice–the choice to not use germline engineering–and

instead my condition should have been prevented; I plead that you don't make the same mistake with your child.".
  - (Hopefully, cases where this would happen and parents wouldn't freely choose to prevent it will be exceedingly rare.)
  - Perhaps the answer is: Do not make an exception, even in this case; uphold the liberty to not intervene. In the long run, the benefit of germline engineering will become so apparent that more or less everyone will freely choose to use it, at least to prevent these extreme cases.

Propagative liberty

Parents have a strong right to propagate their own genes and their own traits, in whole or in some aspects.

- For example, self-cloning is protected by this right.
- Propagative liberty would apply to all parents of a child, i.e. if any parent has a trait, they can choose to predispose their child to have that trait.
- For example, parents who have traits that they view as important to their being have the right to give their children those traits.
  - Deaf parents have the right to genomically choose to make their children deaf.
  - Hearing parents have the right to genomically choose to make their children hearing.
  - This formula applies for more or less any trait, e.g. {blind, sighted, autistic, neurotypical, trans, cis, homosexual, heterosexual, asexual, bisexual, politically conservative, politically liberal, God-fearing, atheistic, ADHD, dyslexic, agreeable, disagreeable, introverted, extroverted, dwarf}.
  - An exception is traits that render a would-be parent severely *non compos mentis*.
- A central reason for propagative liberty is to ensure that no group of people is erased against their will by legal restrictions on their right to renew themselves. Some groups of people might be especially vulnerable due to being further marginalized as many other parents choose to make their future children not be a member of the group; e.g. there might be a lower proportion of deaf people when germline engineering becomes widespread. In order to make a world with germline engineering that is not truly unacceptable to such groups, their right to at least renew themselves through self-propagation has to be protected.

Typicalization liberty

Parents have a strong right to move their future child closer, in expectation, to the median value of one or more traits.

- The reason that typicalization liberty is a tentpole principle is simply that it is substantially harder to argue for major problems resulting from most uses of typicalization:
  - In a straightforward sense, typicalization decreases inequality.
  - In almost all cases, it is quite unlikely that a parent has an atypical trait and they are fine, but if they made their future child be closer to the median on that trait, then that would be catastrophically bad for the child. For example, generally the disease condition is atypical and the non-disease condition is typical.
  - It's much less likely that a more typical trait is burning some commons, compared to a less typical trait. For example, if parents who are taller than the median choose to make their son even taller, then they could be said to be burning some commons; but if they choose to have a shorter son, or if a shorter than median couple chooses to have a somewhat taller son, this doesn't burn commons. Most people are in most respects fairly typical, and generally, society is doing ok given that state of affairs. (There might of course be a more mild decrease of wellbeing from typicalization, e.g. if the parent is exceptionally healthy in some aspect.)
  - (This certainly does not mean that it is moral or advisable to make your child more typical. I think it would be undesirable for very many parents to do that for its own sake–but nonetheless that would be protected from state regulation.)
- In particular, typicalization liberty partially fortifies against attempts to prohibit genomic choices on the grounds that they are "enhancements".
  - For example, genomic choices aimed at increasing a child's intelligence might be legislated against on the grounds that it is "enhancement". But imagine a couple with genomes that, without germline engineering, would give their child a genomic predisposition to have an IQ of 85 on average. This couple might wish to increase that disposition to an IQ of 95. It seems difficult to seriously argue that this is dangerous for first-order reasons just because it falls under the category of "enhancement"; there's no supposed enhanced elite being synthesized, and inequality is being decreased. Intervening to prevent this couple from exercising their genomic liberty would be more transparently an oppressive attempt to protect cognitive privilege.
  - These choices would also be protected by beneficent liberty. But typicalization has a stronger protection, as it is especially perverse to outlaw benefiting your child in a way that makes the child closer to what is typical.

Beneficent liberty

Parents have a strong right to make well-informed genomic choices that a reasonable person would agree are aimed at giving their child a life of wellbeing.

- For a genomic choice to be protected, it's sufficient for the reasonable person to think that the likely outcomes actually do include wellbeing for the child. It's also separately sufficient for the reasonable person to think that the parents genuinely believe, after well-informed reflection, that their choices would give their child wellbeing.
- Beneficent liberty protects, for example, many genomic choices called "enhancement". For example, it protects cognitive enhancement, such as increasing IQ, and it protects health enhancement, such as increasing lifespan well beyond what is typical. It also protects choices that could be argued to burn commons, e.g. making your child much more standardly attractive and thereby perhaps contributing to an unhealthy competition for superficial attractiveness.
- Many cases will require more scientific understanding to decide well. For example, suppose we could give children a superhumanly low risk of cancer by giving them very many protective genetic variants. Since this trait would be well outside the human envelope of variation, it might be excepted from genomic liberty protections as being prospectively very unsafe. But if there's good reason to think that it is safe, then given the clear benefits to the child, this genomic choice might properly be protected by the stronger tentpole principle of beneficent liberty.
- There is a strong case to be made that procreative beneficence is morally obligatory (in balance with other moral considerations)[8]. It would be perverse to outlaw behavior that is morally obligatory without an extremely good reason.

Altruistic liberty

> Parents have a strong right to make well-informed genomic choices that a reasonable person would agree are aimed at giving their child a life that would contribute to the wellbeing of others.

- Altruistic liberty is largely analogous to beneficent liberty. The comparable moral principle is procreative altruism[9].
- For example, parents have a protected right to make genomic choices aimed at increasing the likelihood that their future child will contribute to important scientific advances.

Conclusion

Genomic liberty prevents the state from unduly restricting the freedom of parents to choose the genomes of their children. This principle will defend most people's values, while the exceptions leave room to prevent hypothetically possible extreme misuses of germline engineering technology. Thus society can get the diverse and widely distributed benefits of germline engineering, without unacceptable cost.

Appendix: Some clarifications of genomic liberty

Copying the fuller statement of the GL principle:

> Human parents have the natural right–a negative right against infringement on liberty by the state and society–to freely choose the genomes of their human children, in whole or in some aspects.

Some clarifications:

- GL is a negative right: it stands against infringement by the state or society upon the freedom of parents. To be precise, GL is spiritually aligned with, but separate from, a corresponding positive right: The right to access to technology for altering your future child's genome.
- GL is meant to defend strongly against infringement by the state, but only weakly against social pressure and against professional ethics.
  - GL directly opposes international agreements, national/federal regulations, and province/state regulations that infringe on core genomic liberty rights.
  - Self-regulatory organizations (such as the American Society for Reproductive Medicine) might regulate germline engineering. Genomic liberty, as a political principle about regulation, would not directly speak to this sort of regulation.
  - In spirit, though, GL reflects an attitude that would strongly push for a tentatively very permissive stance, even in terms of social and professional self-regulation.
- GL does not apply to non-human entities.
  - In particular, it does not apply to states making children. If states compel parents to use germline engineering technology, that's a straightforward egregious violation of genomic liberty; but if states themselves make children, this is outside the purview of GL.
  - Certainly, GL does not protect the right of a state to make any genomic choices.
  - Therefore there's no need for an exception from genomic liberty to regulate a state's use of germline engineering. International bodies can restrict state use of germline engineering as much as they want, as far as GL is concerned, e.g. to prevent a state from making "supersoldiers".

[8] Savulescu, Julian, and Guy Kahane. 'The Moral Obligation To Create Children With The Best Chance Of The Best Life'. Bioethics 23, no. 5 (June 2009): 274–90. https://doi.org/10.1111/j.1467-8519.2008.00687.x.

[9] Douglas, Thomas, and Katrien Devolder. 'Procreative Altruism: Beyond Individualism in Reproductive Selection'. The Journal of Medicine and Philosophy: A Forum for Bioethics and Philosophy of Medicine 38, no. 4 (1 August 2013): 400–419. https://doi.org/10.1093/jmp/jht022.

- By default, GL protects genomic choices that others would consider distasteful, immoral, or even anti-social.
  - For example, choosing to make your male child very tall is a kind of burning of the commons: Perhaps he'll be more successful himself, but if everyone does this, no one is better off and everyone is less healthy. GL says this must not be prohibited by the state.
  - However, it might be correct to socially disapprove of that sort of choice. Further, self-regulatory organizations might put soft restrictions in place, e.g. requiring waiting periods, specific information being delivered to the parents, etc., to dissuade them from making choices that many perceive to be anti-social. This might be problematic in itself, but in any case it is not in the purview of GL.
  - For example, the moral principle of procreative beneficence as proposed by Savulescu says that "couples who decide to have a child have a significant moral reason to select the child who, given his or her genetic endowment, can be expected to enjoy the most well-being"[10]. I subscribe to this moral principle. However, GL would oppose this principle being codified into law as a legal obligation for parents to make specific genomic choices. A major issue with doing so is that "well-being" is hard to define, and more importantly people might have genuine differences in their vision of a good life for their children.
  - Another moral principle for genomic choices is procreative altruism "according to which parents have significant moral reason to select a child whose existence can be expected to contribute more to (or detract less from) the well-being of others than any alternative child they could have"[11]. Again, this is a true moral principle, but, according to the GL, should not be made into law.
  - Regarding synthetic biology in general, Gutmann (2011) suggests "regulatory parsimony"[12]. Anomaly, Gyngell, and Savulescu (2020), in discussing collective action problems with genomic choices, suggest applying regulatory parsimony: instead of complex regulation that gives an unclear benefit and restricts parental freedom, we can address collective action problems with social norms[13]. This agrees with the genomic liberty principle: There may be some harms to society due to externalities of genomic choices, but these genomic choices should not be made illegal until there's a quite strong reason to do so.
- The GL principle does not protect any specific germline engineering technology or method.
  - For example, if CRISPR-editing a growing fetus is unsafe (probably it is), then the state can prohibit that.
  - However, heavy restriction of germline engineering technology without sufficient reason would constitute an infringement of genomic liberty.
- GL *does* protect atypical family structures.
  - Some couples can't reproduce naturally, e.g. couples with infertility, homosexual couples, and some trans and intersex couples. GL says that such a couple has a right, protected from infringement by the state, to have genetic children. (This could be accomplished by future frontier reproductive technology, e.g. in vitro gametogenesis and artificial wombs.)
  - GL says that a single parent has a right to have a genetic child, e.g. a clone or an edited clone. (Germline engineering methods using selection would by default be unsafe for a single parent without donor DNA because they would create excess homozygosity.)
  - GL says that a group of more than two people has a right to make a child by combining their DNA (or DNA of consenting donors). For example, mitochondrial replacement therapy (a.k.a. three-parent babies) or chromosome selection from several parents or donors would be protected.
- GL only applies to human DNA.
  - Parents can choose the genomes of their children, as long as the child is then unambiguously and entirely human. In particular, GL does not protect giving the child transgenic DNA (from another species) or novel DNA (that no other human has).
  - This limitation of GL does not imply that transgenic or novel alterations should be forever banned. Perhaps there are some such alterations that are highly beneficial, provably safe, and not degrading to human dignity; they should probably eventually be allowed and supported.
  - But that is a question for later and is outside GL's purview, which is restricted to forming a political policy that can support the basic benefits from germline engineering technology of health, longevity, and capacity for humans.
- Generally, like any right, GL is a living entity, open to revision, and is not absolute.
  - For example, if some people use germline engineering technology to alter their child's DNA in a way that results in some outcome that's truly unacceptable, states should and will prohibit that use.
  - I feel that genomic liberty as described in this article is quite far from well-understood. I expect there to be more exceptions, more tentpole principles, more relevant social, moral, and scientific understanding, and other clarifications.
  - An example question:
    - Propagative liberty strongly protects the right of homosexual couples to predispose their child to be homosexual, and of heterosexual couples to predispose their child to be heterosexual. I like the principle

[10] Savulescu, Julian, and Guy Kahane. 'The Moral Obligation To Create Children With The Best Chance Of The Best Life'. Bioethics 23, no. 5 (June 2009): 274–90. https://doi.org/10.1111/j.1467-8519.2008.00687.x.

[11] Douglas, Thomas, and Katrien Devolder. 'Procreative Altruism: Beyond Individualism in Reproductive Selection'. The Journal of Medicine and Philosophy: A Forum for Bioethics and Philosophy of Medicine 38, no. 4 (1 August 2013): 400–419. https://doi.org/10.1093/jmp/jht022.

[12] Gutmann, Amy. 'The Ethics of Synthetic Biology: Guiding Principles for Emerging Technologies'. Hastings Center Report 41, no. 4 (2011): 17–22. https://doi.org/10.1002/j.1552-146X.2011.tb00118.x.

[13] Anomaly, Jonathan, Christopher Gyngell, and Julian Savulescu. 'Great Minds Think Different: Preserving Cognitive Diversity in an Age of Gene Editing'. Bioethics 34, no. 1 (January 2020): 81–89. https://doi.org/10.1111/bioe.12585.

of propagative liberty as a strong support for genomic liberty: It's quite difficult to argue that parents should be prohibited from passing on their own traits. Typicalization liberty would say that homosexual parents could predispose their child to be heterosexual.
    * But there's no strong protection for heterosexual couples to predispose their child to be homosexual. There's no recognized exception to genomic liberty for this case, and it would be safe; so if genomic liberty is properly upheld, then this case is protected. But should there be another tentpole principle that more strongly protects this choice? More generally, is there some specially protected right to "hop groups"?
    * A possible quasi-generalization of propagative and typicalization liberty would be something like: Any trait that's well within the human envelope can be chosen. This is a sort of protection for choosing within the "shrunken convex hull" of humanity. This principle wouldn't fully contain or be fully contained in any of the other tentpole principles. Also, it would be more cosmopolitan than typicalization liberty, while still capturing most of the spirit. The "shrunken convex hull" principle and typicalization liberty could be unified: There would be strong protection for the right to move your child from where you (as a couple) are, towards the shrunken convex hull of humanity (i.e. to any point in the convex hull formed from you plus the shrunken hull).
  - There probably are many problematic cases I haven't considered. For example, should parents have a protected right to genomically choose to delay puberty? Or on the other hand, should this be excepted from protection and recognized as regulatable? Generally, there are probably a lot of traits that are both in some sense nearly universal in humans, but that have some degree of variation and therefore could be significantly altered genomically. Some but not all of these would be excepted from GL protection by the "no impinging on core human traits" exception.

Appendix: Genomic liberty is a political principle

Summary:

> The principle of genomic liberty is a proposed political policy. As a moral stance, it asserts: The moral cost of curtailing reproductive genomic autonomy is very high, so most uses of germline engineering should not be prohibited by the state. A political consensus to adopt this principle will allow us to get the great benefits of germline engineering without the state infringing on reproductive genomic autonomy.

Elaboration in the following subsections:

Genomic liberty is not a moral stance on specific uses of GE

Summary:

> Genomic liberty is primarily a political principle, not a moral one. It says that, as a society, we should legally protect the right of parents to make determinations about their child's genome. It does not especially recommend that anyone should treat all possible genomic choices as equally moral, advisable, or socially acceptable.

Elaboration:

If I adopt the genomic liberty principle, then, for example, that means I must advocate for the legal right of deaf parents to alter the genome of their potential child so that the child will likely be deaf. And, I must give a minimum of social acceptance to such parents: I cannot discriminate against them in public business transactions, or coordinate social harassment to push them out of communities.

However, I can still hold the moral position that deaf parents *ought not* to do so. Perhaps I believe making your child deaf is immoral, on the grounds that you ought to give your child as much capacity as is feasible, or on the grounds that the child didn't consent to that atypical alteration. I can argue for that moral position, and express disapproval of people's behavior, while still upholding the political principle of genomic liberty. (In fact, personally, I'm quite undecided on the moral question, but I am decided that this choice should be a protected right.)

Of course, a political stance has to be a moral stance, to some degree. To support the genomic liberty principle is also to make a moral assertion:

> For the great majority of ways people will use germline engineering, that use will be not so morally abhorrent that we should use state force to prevent that use, given the high moral cost of curtailing reproductive genomic autonomy.

Political principles support civil compromise

Summary:

> The point of political principles isn't to legislate what's moral, but rather just to legislate legislation. The point of legislation is to make an acceptable compromise that we can agree on. An acceptable compromise should let us interface with fellow citizens at least well enough for basic civil coexistence, and should not produce truly abhorrent outcomes that would reasonably demand harmful unlawful actions to prevent.

> We don't have to like what other people do; we just have to make enough laws that we can fruitfully live together without violence.

Elaboration:

Needless to say, if we think some behavior is moral or immoral, that influences which laws we can and do make about the behavior, and influences which behavior we socially punish. People who believe abortion is immoral will support more restrictions on abortion, and will advocate against political candidates who support abortion rights. Murdering already-born people is very widely agreed to be highly immoral, and is therefore extra super illegal.

However, moral stances do not and should not always translate into legal regulation. There are many forms of speech that many find abhorrent, such as expressing Nazi ideology. In 1977, two Jewish lawyers from the ACLU, a civil liberties organization, famously helped to legally defend a neo-Nazi group's right to hold public demonstrations. The legal protection is upheld even for abhorrent behavior.

Furthermore, attempting to enforce a moral view through coordinated extra-judicial violence should be viewed as an extremely unacceptable breach of civil norms, even beyond being straightforwardly illegal. In order to maintain basic order, the government has a monopoly on initiating violence. The government does abuse this power, and this betrayal is extremely corrosive; but the government monopoly on initiating violence is crucial. Vigilante justice, mob violence, and coordinated illegal harassment are another betrayal of basic civil order. Such extra-judicial violence is politically and morally motivated: no one is staging illegally violent protests in order to legalize murdering already-born people, because approximately no one believes that murder is morally or socially acceptable.

Legal principles are supposed to be how we achieve a basic coordination, so that individuals and groups can live together in a country, freely and without unduly destructive conflict. Assaulting legal abortion clinics, doctors, and patients is unacceptable; political riots that destroy and disrupt public property are unacceptable; SWATing ideological Nazis is unacceptable; harassing sex workers is unacceptable. Get the law changed, or restrict yourself to non-violent opposition.

Actions that harm others are much more heavily regulated compared to actions that only harm yourself. Consuming consensually-produced pornography is legal, suicide is legal, alcohol addiction is legal. All of these are to one or another extent self-harming, and in many cases immoral, but they generally don't materially harm others enough to justify per se legal regulation.

So generally, the point of law, flowing from political policy, is a peaceful enough coexistence through resolution of conflicts with sufficient justice for all parties.

Genomic liberty as a proposed civil compromise

Summary:

> Many people will have various objections to different ways that parents might wish to alter their child's genome. However, the genomic liberty principle states that these objections should, for the most part, not become law. Broad genomic liberty should be an acceptable compromise: it protects individual reproductive autonomy, while leaving room for prohibition of exceptionally harmful uses.

Elaboration:

The use of human germline genomic engineering technology will be contentious. Many will strongly oppose using it at all. Many others will oppose any *permission* from the state to alter genomes. Many will strongly oppose some of its uses, e.g. parents altering their child's IQ or parents predisposing their child to dwarfism.

On the other hand, many will oppose any influence on people's reproduction from the state, as that would overlap in intention and in practice with harmful eugenic policies. Many will strongly oppose specific restrictions on the use of germline engineering. For example, some fraction of gay people might strongly wish to predispose their own child to also be gay. Some fraction of Christian people might strongly wish to predispose their own child to remain Christian through adulthood. Many such groups would have reason to oppose restrictions on their ability to propagate.

The benefits of germline engineering will be straightforwardly awesome: halfway to the end of all disease, long lives for our children, and a great flowering of many diverse human capacities. To get these benefits, we need a political policy about germline engineering that most people find acceptable.

If there were a political policy that had the state substantially infringing on people's reproductive genomic choices, that political policy would be a poor compromise. If there were lots of people who would want to choose aspects of their children's genomes, but who can't because of state regulation, those people would have reason to strongly object to the policy. Thus, the principle of genomic liberty is meant to be a central aspect of a broadly acceptable compromise policy.