

Global Essay Competition 2026

Title: The Price of a Perfect Start: Tackling the Algorithm-driven Biological Caste System

Essay:

Introduction

In the recent times, with the advent of better technology, the bioethical landscape has moved beyond the hypothetical. The transition from reproductive luck to 'reproductive math' is the emerging defining crisis of our time, representing a fundamental shift in how we value human existence. For the entirety of human history, creation of new life has been focused towards the creation of a viable child, one who could survive independently in the society. The random distribution of traits inherited in a child ensured that no life path was entirely predetermined. Today, that randomness is being dismantled by an algorithmic hierarchy [1-3](#). While international regulators have established rules and guidelines with the ethics of CRISPR and surgical germline editing [4](#), the real threat has arrived through the backdoor, that is, by virtue of embryo selection. This shift is quiet and camouflaged within the clinical pursuit of success rates. The real danger is not that we are changing the genome, but that we are ranking it [5-11](#). We have begun to regulate the tool of editing while ignoring the intent of selection, allowing private genomics companies like Heliospect, and Orchid, to build a hierarchy based on proprietary metrics [3.12-20](#).

As clinical data confirms, the synergy between time-lapse imaging and AI-enhanced embryo selection has become the new standard in modern embryology [7.21.22](#). Time-lapse imaging uses undisturbed cell-culture conditions to capture continuous visual data that human eyes cannot process [23.24](#). Techniques like trophoectoderm biopsy allow firms to extract DNA from the developing embryo, and identify the genetic sequence. Using the imaging and sequence data, AI algorithms then not only identify viability, but they also map and project polygenic trait scores that help predict future performance based on risk of disease, abnormalities, and in the recent times- traits like intelligence, and height [6.10.21.25-27](#). By shifting from gene editing to algorithmic ranking, the for-profit IVF industry has effectively bypassed the ethical barriers that slowed down CRISPR-based gene editing.

The intersection of technology with demographics has shifted the focus from treating defects to perfecting identities. To ignore this shift is to accept the quiet construction of a world where life is no longer a gift to be received, but a high-yield investment to be optimized.

The Problem:

Technology that allows selection of 'upgraded' children, right at conception

Currently, bioethics are mostly narrowly focused on CRISPR-based gene editing, a physical intervention that is easy to monitor and mostly prohibited, while at the same time neglecting AI-driven polygenic embryo screening (PGT-P), which can achieve similar eugenic results but through an unregulated marketplace of information [3](#). Although the scientific community has condemned the Chinese scientist, He Jiankui, for editing genes in babies, companies like Genomic Prediction, Heliospect, and Orchid are still operating in 2026, not only selling healthcare but also peace of mind and competitive advantage in a profit-driven IVF industry that presents the choice of embryos as a consumer right rather than a medical necessity [3.12-14.16.25.28.29](#). This regulatory gap is a consequence of strictly regulating the means (the molecular scalpel for editing) while at the same time disregarding the purpose (the systematic selection of the 'best' human), thus a new form of consumer eugenics is being allowed to develop under the pretense of reproductive liberty [17.30](#).

Since AI scoring is marketed as simply providing data rather than changing biology, it sidesteps the legal frameworks aimed at gene editing, operating in a time when companies are probabilistically promising traits like improved IQ, promises which may never happen since environmental factors have an overwhelming influence [3.8](#).

Recent reports on risk score based embryo selection showcase an alarming trend. IVF firms that provide selection for non-disease based traits such as intelligence, longevity, height, etc., are expected to open 150-200 clinics across 6 continents [25,31](#). Furthermore, the use of Preimplantation Genetic Testing (PGT) in general (mostly for chromosomal abnormalities) has exploded in the U.S., increasing 10-fold from less than 4% of IVF cycles in 2008 to over 40% in 2018. This established infrastructure facilitates add-ons of trait-based screening [32](#). Surveys also indicate significant consumer interest. One study found that 82% of respondents would be interested in using polygenic embryo screening if they were already undergoing IVF [8,31](#). Another study involving 113 IVF patients reported that 56% elected to perform risk scoring when offered [31](#). The net overall specific market for AI-powered embryo selection is expected to grow from 165 million USD in 2024 to 522 million USD by 2035 [33](#).

Consequences of consumer eugenics, if unregulated

The consequences of this unregulated market are profound. Beginning with the reality that because these services are prohibitively expensive, costing up to \$50,000 for IQ screening, they threaten to deepen the economic divide into a biological caste system [9,20,34](#). If wealthy parents can optimize their offspring for health and cognitive function, 'natural' children will begin life with a biological debt they can never repay, effectively creating a 'genetic elite' [9,15,20,34,35](#). This dynamic threatens to transform choice into coercion, as insurance companies might eventually view the failure to utilize these technologies not as a moral stance but as negligence, penalizing those who leave reproduction to chance with higher premiums [29](#).

This drive toward optimization is also currently built on a foundation of algorithmic colonialism, since the Polygenic Risk Scores (PRS) used are overwhelmingly derived from European biobanks like the UK Biobank. By exporting these Western genomic standards as the universal ideal, we enforce a homogenized definition of humanity that is statistically inaccurate for African, Asian, or Hispanic populations, effectively letting a Silicon Valley algorithm define the perfect human [3,10,31](#).

From a biological standpoint, this industrial selection is akin to playing with fire since genes are pleiotropic. For instance, by selecting a trait deemed to be positive like high intelligence, one might on the downside selection autism, bipolar disorder, or anorexia, potentially stripping away valuable traits like creativity (removing the messy inheritance that defines humanity) [3,25,31,36,37](#). Furthermore, this process of selection of 'better' variation risks homogenizing the gene pool, reducing the genetic diversity that is essential for our adaptation and resilience of the human species [31,38,39](#).

Ultimately, this practice devalues existing lives by encoding the message that disability is a defect to be erased and fundamentally alters the parent-child relationship by destroying the concept of unconditional love [35,40](#). When a child is selected for defined specifications like Low Obesity/ High IQ, they become a product designed to fulfill parental expectations, building resentment into the genetic contract if the child grows up to be an obese artist rather than the optimized investment their parents paid for, leaving the child to feel like a project rather than a person [3,8,35](#).

The Solution

Addressing the existential threat of unregulated market-driven eugenics requires enactment at the global level. As a solution to this upcoming threat, a legal and ethical firewall ought to be created through a 'Genetic Equity Act', an Act with its roots in the fundamental "Right to a Random Genome". This right posits that the unmanipulated human genome is a shared heritage of humanity rather than a canvas for commercial optimization [25](#). This right acts as a safeguard for human dignity, protecting the genetic wilderness or biodiversity of the species from the homogenizing forces of industrial selection, where children are reduced to manufactured products defined by parental specifications rather than accepted as gifts of nature [29,41](#). By embedding the concept of an open future into law, this initiative reflects a child's right not to have his/her options limited by the choices of the parents or the pressure of receiving a certain genetic profile, thereby preventing the instrumentalization of human life that critics warn, could alter the very meaning of childbearing [31](#).

In order to make this protection a reality, the Bill has to break down the 'black box' opacity that AI, based selection tools are currently operating under through mandatory Algorithm Transparency, thereby forcing companies such as Heliospect, Orchid, and Genomic Prediction to open their proprietary scoring systems to rigorous audits [29.42](#). Currently, these entities operate in a regulatory vacuum, marketing polygenic risk scores (PRS) and embryo health scores based on limited data and unproven predictive utility, often making exaggerated claims about intelligence or disease avoidance that function as deceptive health products, primarily because many traits are largely also influenced by the external environment [29.43](#). Mandating open-source requirements would expose the statistical frailty of these scores (which often explain only a fraction of observed variation in traits among different subjects), and reveal the Eurocentric biases inherent in training datasets that threaten to deepen health disparities for non-European populations [29.31](#).

Furthermore, because the creation of genetic hierarchies inevitably invites discrimination, the Act must enforce a strict 'Right to be Unknown' by categorically banning the use of pre-birth genetic scores by insurers, employers, and educational institutions [29.44-46](#). Experts in law caution that without such genetic privacy legislation, a permanent genetically disadvantaged class could develop, where 'naturally born' children might suffer the consequences of having to pay additional insurance premiums or being deprived of opportunities based on risk assessments made probabilistically even before they were born, thus effectively turning biological chance into a lifelong unavoidable debt [29.35](#). To prevent this, the Right would mandate that a person's preimplantation risk score be legally erased at birth, preserving their right to an open future and preventing the crystallization of a genetic caste system [29.31.47](#).

Finally, recognizing that biotechnology capital moves fluidly across borders to exploit regulatory gaps, a phenomenon known as regulatory arbitrage or, reproductive tourism, the solution necessitates the creation of a Global Bio-Data Agency (GBDA) modeled after the International Atomic Energy Agency [48-53](#). Just as the IAEA monitors nuclear proliferation, the GBDA would be overseeing the spread of reproductive AI and germline editing, aligning standards to make sure that no country turns into a sanctuary for unethical experiments or genetically modified populations which could lead to global security being destabilized through geoeconomic confrontation. By centralizing oversight and enforcing compliance with the Genetic Equity Act, this global body would ensure that the power to reshape the human genome is governed by a consensus on human rights and dignity, rather than the caprice of the market or the strategic ambitions of individual states [41.52](#).

Conclusion:

There exists an assertion that 'freedom of choice' is a reductionist fallacy in the unregulated marketplace of reproductive technology. This statement is grounded in the reality that when technologies like polygenic embryo screening (PGT-P) are accessible only to the wealthy, choice devolves into a form of market coercion that deepens the economic divide into a permanent biological chasm. This creates a genetic aristocracy where the affluent can embed their socioeconomic advantages into the genome itself, purchasing potential gains in health, intelligence, and longevity that are denied to the naturally born underclass, thereby rendering the concept of equality of opportunity a complete myth.

Thus, genuine freedom is not the consumerist licence to acquire the 'best' child from a 'gene supermarket', but rather the defence of a child's right to have an uncharted future, a life that is not predetermined by parents' genes, engineering decisions or an algorithm's biased probabilistic suggestions. As these algorithms are often trained on Eurocentric data, they come with false promises of high accuracy, while simultaneously disregarding the environmental influences, which makes them likely to treat children as mere products designed for performance instead of human beings who deserve unconditional love. Thus, a biological caste system or an enhanced rat race scenario in which parents are driven to genetically 'upgrade' their children just to avoid being outclassed genetically, can only be prevented if the society continues to establish solid regulatory safeguards like the proposed Genetic Equity Act that ensures the transparency of algorithms, bans the use of pre, natal genetic scores by insurance companies and employers and prevents genetic profiling from becoming a prerequisite for social participation. Without these measures proscribing the inclusion of genetics into

the market forces, we will be heading towards a time when the description of the perfect human will be a proprietary code, the dignity of the human being will be degraded by the commercialization of eugenics and the untamed genetic heritage of our species will be replaced by a uniform, engineered high, class.

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| Aid | Usage | Affected parts |
|-------------|--|------------------------|
| Grammarly | Spell check | Complete paper |
| Notebook LM | Creation of text passages, these were commented in the following chapter | Portions of conclusion |
| Zotero | Compilation of the literature index | Literature index |

Word Count (essay text only): (2066/2100)