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# Pregnancy Is a Survival Pathology: A Biostatistical Approach

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## Abstract

This paper argues that biostatistical theory (BST) cannot categorically exclude pregnancy from pathology. Common harmful conditions in typical pregnancies are integral to the notion of pregnancy per se. Given this definition, there are two potential ways to classify pregnancy as non-pathological within the BST: (i) most common conditions in pregnancy are not pathological within the appropriate reference class; or (ii) pregnancy's reproductive value counterbalances its pathological survival harms, rendering it non-pathological. I challenge both views, arguing that non-pregnant women of the same age should be the reference class, making pregnancy a survival pathology that cannot be offset by reproductive value.

## 1. Introduction

Pregnancy predictably harms the health of women in various respects, yet it is not usually classified as a pathology in its own right. However, when the same harms occur in most other situations, they are often classified as pathological.

In the debate on the definition of pathology, pregnancy is rarely considered pathological. Rachel Cooper, adhering to a normative framework, posits that while unwanted pregnancy may be deemed pathological, a wanted pregnancy is not (Cooper 2002). Christopher Boorse, a distinguished naturalist about health who formulated the biostatistical theory (BST), more forcefully opposes classifying pregnancy as a pathology, suggesting that doing so would signify a "game over" for medical thought (Boorse 1997, 44). In their recent article, Anna Smajdor and Joona Räsänen reevaluate pregnancy using established disease theories. They assert that the health harms and risks in pregnancy provide good reasons to consider it a disease within Cooper's framework. Regarding the BST, however, they argue that if one accepts its goal-directed normality framework, pregnancy may indeed not be considered a disease (Smajdor and Räsänen 2024, 5). Instead, they critique what they perceive as the conceptual flaws within the BST.

The aim of this paper is not to explore the social implications of classifying pregnancy as a pathology, nor to address the conceptual issues in the BST, but rather to reexamine

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pregnancy *within* the BST. I argue that even if we accept the rationale of the BST, this framework cannot categorically exclude pregnancy from being classified as a pathology,[1] suggesting that it may be, at least, a form of what I call "survival pathology" for the gestator.[2]

To evaluate pregnancy within the BST, one must first determine whether pregnancy-related common conditions are pathological. If they are not, then no aspect of a typical pregnancy is pathological. However, if they are pathological, one must then assess whether the reproductive contributions of pregnancy have an overriding power to negate its pathological aspects. In other words, the exclusion of pregnancy as a pathology can be ethically justified in two potential ways. First, the harmful conditions frequently encountered by gestators are statistically typical within the appropriate reference class and, therefore, not pathological. Second, even if these common conditions are perceived as pathological to the gestator's survival, they can be offset by the reproductive contributions of pregnancy, ultimately rendering it non-pathological overall. Boorse himself appears to adopt both approaches; however, this paper argues that neither withstands scrutiny.

The paper proceeds as follows: after an overview of the BST, section 3 outlines two approaches for classifying pregnancy as non-pathological. Section 4 refutes the first approach, establishing that many, if not all, common conditions in pregnancy are pathological within the appropriate reference class—nonpregnant women of the same age. Section 5 counters the second approach, arguing that the BST cannot provide a convincing reason to prioritize reproduction over survival. Consequently, survival and reproductive goals should be examined separately, categorizing pregnancy as a survival pathology. Finally, section 6 briefly considers the impact of emerging reproductive technologies on the pathological assessment of pregnancy.

## 2. The Biostatistical Theory

The BST aims to provide an account that distinguishes health from pathology in a way that relies solely on notions drawn from the sciences, without relying on any evaluative notions (Boorse 1976, 1977, 1997, 1999, 2002, 2011, 2014). The BST is described as follows:

1. The reference class is a natural class of organisms of uniform functional design; specifically, an age group of a sex of a species.
2. A normal function of a part or process within members of the reference class is a statistically typical contribution by it to their individual survival or reproduction.
3. Health in a member of the reference class is normal functional ability: the readiness of each internal part to perform all its normal functions on typical occasions with at least typical efficiency.
4. A pathological condition is a type of internal state that impairs health; that is, reduces one or more functional abilities below typical efficiency (Boorse 2014, 684).

Key concepts need clarification for the subsequent discussion. The "reference class" in the BST is a comparison group for functional efficiency, distinguished by traits such as age, sex, and species (Boorse 1977). An organism's internal part or process is considered pathological

[1] In this paper, the term "pregnancy" encompasses both the perinatal stage and childbirth, except when different gestational stages are explicitly stated.
[2] Using gender-inclusive language, this paper strives to use "gestator" or "pregnant individuals." When "women" is used, this term does not exclude trans men.

if its functional efficiency falls significantly below the average within the appropriate reference group. Pathology assessments are thus relative to the reference class. For instance, the inability to walk is pathological for adults, but not for infants, since it falls significantly below the average walking capacity of adults, but not of infants.

The "survival or reproduction" (Boorse 2014, 685) of the individual are employed as the ultimate goals of organisms; function is the causal contribution to these individual (not species-level) goals.

"Functional ability" in the BST underscores that functioning is relative to specific occasions (Kingma 2010, 248; Boorse 2014, 704). For instance, blood clotting occurs only in response to injury; the inactivity of clotting mechanisms does not imply a loss of function but rather a readiness to act when needed. Therefore, assessing functional efficiency involves evaluating its potential performance in specific occasions.

In general, the core spirit of the BST is statistical, quantitative, or, in other words, mathematical. Every notion it involves must adhere to this point; otherwise, the theory loses its essence. Perhaps the entire BST can be viewed as a mathematical matter.

To assess whether any part or process of an individual's body system is pathological, such as Lucy's thyroid secretion state, the steps may involve:

1. Quantitatively determine, if feasible, the contribution of her thyroid secretion to survival and reproduction (functional efficiency). Note that it is the precision of secretion, not its amount, that determines this contribution.
2. Select a reference group using relevant parameters such as sex and age to establish the group's average functional efficiency of thyroid.
3. Compare two results. If her thyroid functional efficiency is "far below" this average (Boorse 2014, 684), it would indicate pathology.

However, applying the BST to determine whether pregnancy is pathological is far more complex. Pregnancy encompasses various conditions across different pregnant individuals and introduces goal conflicts between reproductive contributions and survival harms. Therefore, in what follows, I first untangle pregnancy's complexity and its implications for assessment.

## 3. Should "Pregnancy Per Se" Be Distinguished from "Pregnancy-Related Conditions"?

In their rebuttal of Smajdor and Räsänen's paper (2024), some authors argue for a distinction between pregnancy and its adverse conditions (Baron 2024, 49; Rezkalla and Smith 2024, 53) but this claim is ambiguous.

If determining whether to assess a physiological change, *x,* and its symptoms as a whole depends on *x* being pathological, as implied by Paul Rezkalla and Emmanuel Smith (2024, 52),[3] it creates circular reasoning.

Defining pregnancy per se is essential in this regard. If pregnancy per se only means "having the fetus in the gestator's uterus," any survival harm to the gestator would not

[3] Rezkalla and Smith (2024) admit that such a distinction is not applicable to cases such as measles. However, they argue it applies to those things typically not considered pathological, such as puberty, which often involves physical, psychological, and social challenges. This creates a circularity because when assessing whether a case is pathological, we cannot determine if such a separation should apply without knowing if it is pathological.

render pregnancy pathological. However, both lay perspectives and medical practice consider a pregnancy pathological if its harm to the gestator exceeds a certain threshold, regardless of fetal health. Moreover, if pregnancy were simply defined as "having the fetus," much of the debate over its pathological status would lose relevance—the core controversy in discussions of pregnancy has always centered on the frequently occurring conditions that harm the pregnant individual.

Pregnancy, per se, is more reasonably seen as a process in which nonpregnant physiology is markedly altered for a period, carrying significantly higher risks of morbidity and mortality than nonpregnancy (Hern 1971, 6–7). The common symptoms and conditions in pregnancy are part of these physiological alterations;[4] thus, they are integral to pregnancy per se, or a typical pregnancy.

One might still argue that pregnancy should be distinguished from its harmful conditions, in the sense that survival harms alone may be insufficient to classify pregnancy itself as a pathology. Within the BST, two potential approaches, if established, could support this claim:

1. Most common conditions in pregnancy are statistically typical within the appropriate reference class; or
2. pregnancy's reproductive value counterbalances its pathological survival harms, rendering it non-pathological overall.

The first approach denies the pathological nature of common conditions in pregnancy. Surely, if these conditions are non-pathological, a typical pregnancy as a whole would also not be pathological? This approach largely relies on using the pregnant population as the reference class.

The second approach concedes that even if many (if not all) frequently occurring harmful conditions in pregnancy are pathological, these could be offset by pregnancy's reproductive contribution, given that the reproductive goal takes precedence over survival. Clearly, the validity of this approach hinges on prioritizing reproduction over survival.

Boorse appears to adopt both approaches, using pregnant women as the reference class and prioritizing reproductive over survival goals (I elaborate on these points in later discussions). But the BST does not support either approach. Section 4 refutes the first approach, while section 5 counters the second.

## 4. Can Common Conditions in Pregnancy Be Considered Pathological?

In the BST, determining whether a biological condition is pathological requires establishing the correct reference class and assessing whether the condition significantly reduces functioning compared to this group mean. Claims that common conditions in pregnancy are normal or non-pathological rely heavily on using pregnant individuals as the reference class.

[4] In the BST, distinguishing between symptoms and conditions is unnecessary, as it only cares about whether an organism's internal change causes statistically atypical functioning. For instance, "fever and diarrhea" are viewed both as symptoms—indications of underlying diseases—and as conditions in their own right. Boorse (1977, 552) mentions this in his discussion of nomenclature, noting that pathology in the BST has a broader sense.

This section refutes this approach, proposing that the BST should, instead, use nonpregnant women of the same age as the reference class, thus rendering many common pregnancy conditions pathological.

### 4.1 The Reference Class Matters

No one would deny that certain specific pregnancies are pathological. For instance, an ectopic pregnancy or one with abnormal fetal development, compared to others at the same stage, are both typically classified as pathological. Also, a pregnancy that results in physical harm to the gestator, exceeding a certain threshold, is usually regarded as pathological in medical practice. Nevertheless, the core controversy is not about such pregnancies but rather those conventionally seen as "normal," which often involve harmful conditions that would often be considered pathological if experienced by nonpregnant individuals.

According to the United Kingdom's National Health Service (NHS) (n.d.), common conditions in pregnancy include constipation, cramps, feeling faint, incontinence, frequent urination, varicose veins, and symptoms such as back pain, bleeding gums, headaches, indigestion, heartburn, nosebleeds, pelvic pain, piles, stomach pain, stretch marks, swollen ankles, feet and fingers, tiredness, sleep problems, thrush, vaginal discharge, vaginal bleeding, vomiting, morning sickness, and weight gain. Ongoing research reveals more widespread harms in pregnancy, such as a significant reduction in gray matter volume and cortical thickness across the brain (Pritschet et al. 2024).

Moreover, childbirth, the final stage of pregnancy, results in pain and tissue damage for nearly all who go through it, with international studies reporting perineal tear injury rates as high as 85% (Edqvist et al. 2017).[5]

Most of these conditions are often regarded as parts of a "normal pregnancy" in medical practice. However, according to the BST, whether these conditions are considered pathological largely depends on the selected reference group.

If the reference class is finely grained—such as using pregnant women of the same age as an independent reference group—frequently occurring harmful conditions in pregnancy become statistically typical. When selecting pregnant women of advanced age as the reference group, even age-related pregnancy complications like gestational diabetes and preeclampsia may appear non-pathological due to statistical typicality. Similarly, if the reference group consists of pregnant women with preexisting medical conditions, complications such as deep vein thrombosis, high blood pressure, and intrahepatic cholestasis could also be classified as non-pathological. Furthermore, when considering geographic regions—where areas with high fertility rates and limited maternal support contrast with those with lower fertility rates and greater maternal support—the same condition might be judged differently in terms of pathology.

However, if the reference class is not limited to pregnant individuals, many (if not all) pregnancy-related conditions could be considered pathological. Since most women of reproductive age are not pregnant (Kingma 2010; Smajdor and Räsänen 2024), using women of the same age (both pregnant and nonpregnant) as the reference group reveals that many common pregnancy conditions significantly lower the functional ability of

[5] Henceforth,"common conditions" refers to those defined by the NHS, as well as common issues such as injuries and trauma caused by childbirth.

pregnant individuals relative to the mean. This disparity becomes even more pronounced if the reference group consists solely of nonpregnant women of the same age.

Therefore, the BST must first stipulate the reference group for examining these conditions; only then can it assess whether these conditions result in functioning significantly below the average.

## 4.2 Two Hidden Principles for Selecting a Reference Class

As Elselijn Kingma (2007) points out, the validity of the BST relies on an appropriate set of reference classes. The BST stipulates a basic list for selecting reference classes—age, sex, and species—while remaining open to more specific categories, guided by empirical facts (Boorse 1977). This openness has sparked debates over the challenges of reference class selection, with two main criticisms suggesting that the BST may collapse under these challenges.

Criticism 1: An *overly fine-grained* reference class might cause the BST to fail in distinguishing health from pathology.

Criticism 2: The relativity of function to specific *occasions* might cause the BST to falter.

I contend that the rationale underlying the BST can likely provide reasonable responses to these criticisms and establish two principles for selecting reference classes.

### *4.2.1 Establishing Principle 1*

Selecting a reference class based solely on sex, age, and species can be overly broad. For instance, classifying a trait causing altitude sickness as pathological without considering long-term residence at low altitude seems unreasonable. This raises the question of how specific the reference group should be. Cooper (2002) suggests that factors such as race, location, and training should be considered in selecting reference classes, but overly narrow classes may reduce reliability in determining pathology. Kingma (2007) argues that empirical facts cannot tell whether a broad or narrow reference class is correct; for example, no empirical evidence can indicate whether "women" or "short-sighted people" is the appropriate reference class for a woman with short-sightedness. If any group could serve as a reference class, no condition could be classified as disease—for instance, using cancer patients as the reference group would make cancer statistically normal (Lewens 2015).

While this paper does not focus on the validity of the BST itself, I contend that this type of criticism is probably overstated. At least in terms of the bottom line for narrowing the reference class, the BST can appeal to common sense—comparison necessitates differences. When determining whether a condition is typical, it is unnecessary to select individuals who exactly share the condition in question for comparison. True, the mere fact that a woman has myopia does not dictate whether her reference class should be "women" or "myopic people." However, if myopia is the trait being assessed, the reference class cannot consist *solely* of individuals with myopia. Similarly, cancer patients cannot form a separate reference class for evaluating cancer. It is meaningless to assess whether a condition is pathological by comparing it to the mean of a population in which everyone is already known to have that particular condition. Therefore, the BST can indeed establish a fundamental principle for selecting reference classes:

> (P1): When assessing whether a condition X1 (a state of a body part X's functional efficiency) is pathological, the reference class must *not* be restricted only to those individuals who have condition X1.

In other words, P1 indicates that we cannot use "having the condition in question" as a criterion for selecting members for comparison.

What does this imply for assessing pregnancy? Consider a challenge from other cases: one might argue that P1 would prevent us from using infants, adolescents, or aging groups as reference classes to assess whether "infancy," "puberty," or "aging" is pathological, while within BST, examining conditions in these life stages using age and sex as dimensions for choosing the reference group seems reasonable.[6]

Both parts of this argument are correct; the problem is that they are not contradictory. Instead, they reveal a key fact: under the BST, a life stage with multiple conditions cannot be *directly* assessed as a single condition. Each condition must first be examined individually, with the life stage's pathology determined based on statistical normality after these assessments. In this way, P1 is not violated.

For example, when assessing whether osteoporosis in an elderly man is pathological, using other aging men as the reference class does not violate P1. However, selecting a reference class based on "having osteoporosis" would violate P1. To assess whether aging, infancy, or puberty is pathological using BST, the process involves examining each common condition within the stage and then determining the overall statistical outcome to assess whether the entire stage can be considered pathological.

By the same token, any vague claim that pregnancy is not pathological, while using pregnant women as the reference class, may violate P1. To assess whether pregnancy as a whole is pathological, the process involves evaluating each frequently occurring condition individually, rather than treating pregnancy as a single condition to assess directly. Using pregnant individuals as the reference class to assess specific conditions, such as insomnia, vomiting, or vaginal tearing, does not breach P1 (but using groups defined solely by those conditions—such as individuals with insomnia, vomiting, or vaginal tearing, whether pregnant or not—would violate P1).

The above merely outlines the steps for assessing pregnancy; it does not imply that the pregnant population is the appropriate reference class. Using this class may conflict with a second principle concerning the situational nature of function or its relativity to specific occasions—a principle established in response to Criticism 2. This principle is more crucial than P1 for determining whether a common condition in pregnancy is pathological. It is to this point that my discussion now turns.

### *4.2.2 Establishing Principle 2*

Many functions occur on specific occasions and assessing a function means examining it within the appropriate occasion—its "functional ability" (Boorse 1977, 562). For example, evaluating whether someone's vision is statistically typical requires comparison with others whose eyes are open, not closed; assessing heart rate during running involves comparing it with others also in a running state. Simply put, a reference class often refers to a group

[6] Thanks to Tim Lewens for raising this challenge.

within a particular occasion. When pregnancy is treated as a specific "occasion," individuals in this state—pregnant individuals—serve as a prima facie reference class for assessing conditions in pregnancy.

However, not all occasions should be used in selecting a reference class; otherwise, many clear pathologies would no longer be classified as such. For example, assessing "fever" in a person with Covid-19 by comparing them with others in the same occasion—those infected with the virus—might lead to the conclusion that "fever" (and other conditions during Covid-19 infection) is not a statistical deviation.

Authors such as Wim J. van der Steen and P.J. Thung (1988) have already highlighted this issue, using examples such as mountain sickness and heat exhaustion. In response, Boorse invokes a *supplementary clause* to the BST: "a statistically species-subnormal function (in the usual sense of an arbitrarily chosen lower tail) is pathological if it results from an environmental factor outside an arbitrarily chosen central statistical range of that factor in the environments where the species lives" (Boorse 1997, 84).

This stipulation serves as the BST's response to such criticisms. As Daniel M. Hausman (2011, 661) clarifies, it implies that if an organism's functioning is statistically subnormal in a typical environment, it is considered pathological, even if it appears statistically normal in an atypical environment.

Although this stipulation does not mention the reference class, I contend that it inherently implies the reference group must consist solely of individuals in typical conditions. If an organism's part develops a condition in an atypical environment, we should imagine its performance with that condition in a typical environment and compare it to others there. For example, if a person suffers sunburn in a 60-degree (atypical) environment, the sunburn is pathological because, even in a typical temperature, her burned skin would still function significantly below that of others in the typical temperature. Whether others also get sunburn at 60 degrees is irrelevant to whether her sunburn is pathological.

Furthermore, although the stipulation uses the term "environment," it logically encompasses not only the external physical environment but also the organism's biological activities, such as sleeping, exercising, and pregnancy, which I refer to as "occasions."

Distinguishing typical from atypical occasions is a question for the next part. Here, I introduce an interesting debate between Kingma (2010, 2016) and Hausman (2011) to further clarify how the BST determines the reference class concerning typical and atypical occasions. Kingma (2010) raises a similar criticism of the BST using the example of poisoning: Carol's paralyzed digestion is statistically typical among others in the same situation; unless the BST can classify poisoning as atypical, Carol's condition would not be considered pathological. In her view, the BST fails to distinguish typical from atypical occasions, risking its collapse.

Hausman (2011, 657–668) counters that even if poisoning is regarded as a "relevant" (or "typical" in BST terms) occasion, the theory can still classify Carol's paralyzed digestion as pathological. He appears to adopt a different comparison approach, explaining: "What determines whether the capability of Carol's paralyzed digestion is pathological is the comparison between how it would function in those situations and how people's digestive systems would on average function in *those* situations" (2011, 664).

However, this comparison does not seem to support the conclusion that Carol's digestion is pathological. If poisoning is considered typical, "those situations" would include

the occasion of poisoning. When Carol, while poisoned, engages in typical activities like eating, her digestive functioning, compared to others across a variety of situations—including poisoning and eating—would not be significantly diminished.

Also, as Kingma (2016, 393) responds, the appropriate reference group should be individuals in a specific occasion, not across multiple occasions. Consider other uncontested typical occasions. Suppose we assess whether Carol's heart rate during exercise is normal. According to Hausman's suggestion, we would need to consider Carol's heart rate across a variety of typical activities, such as sleeping and walking, and compare them to others in these activities. However, Carol's heart rate in *each* specific occasion—whether actual (exercising) or hypothetical (sleeping, walking)—should be compared only with others in the *same* occasion. Comparing Carol's heart rate while running to those who are sleeping would be inappropriate.

To clarify again, if an occasion is typical, an individual's condition in that occasion should be compared with the average of a group in the same occasion. For example, a sleeping person's heart rate is compared with that of others also sleeping (within age and sex parameters).

Yet, if an occasion is atypical, the condition in that occasion should be compared to the average functioning of those in *typical* occasions. Since poisoning is not typical for humans, as Boorse (2014, 704) argues in response to Kingma's challenge, the functioning of individuals who are poisoned should be compared to those in poison-free, typical situations (adjusted for age and sex parameters). Given that "non-poisoned human beings are fully ready to digest a meal" (2014, 704), Carol's digestion can be considered pathological.

Thus, the second fundamental principle of the BST regarding selecting the reference class can be:

> (P2): When determining whether a condition X1 in a particular occasion Y is pathological, the reference group should consist of individuals (within age and sex parameters) in the Y occasion, only if Y is a typical occasion; otherwise, it should consist of individuals in typical occasions that are not Y.

At this stage, the viability of using the pregnant population as a reference group hinges on whether pregnancy is a "typical occasion." Only if pregnant individuals serve as an independent reference group can most common conditions in pregnancy be deemed statistically typical. But the BST fails to justify pregnancy as a typical occasion, as I discuss next.

### 4.3 Pregnancy Is an Atypical Occasion

The BST does not explicitly provide criteria to distinguish typical occasions from atypical ones.[7] Considering some of Boorse's responses to relevant criticisms, I evaluate the following criteria: (i) species-typical design; (ii) the frequency of occurrence; and (iii) comparative typicality, demonstrating that pregnancy is not a typical occasion.

[7] Kingma (2010) discusses how the BST fails to differentiate between typical and atypical conditions; however, this paper does not aim to address that issue. Instead, it only focuses on examining pregnancy following the criteria suggested by Boorse.

The first criterion for distinguishing typical occasions from atypical ones may seem to be whether the occasion represents a *species-typical design*. Intuitively, pregnancy appears to be a natural function of the body, just like other bodily functions. Yet, this conclusion cannot be straightforwardly drawn from the BST because it leads to circularity.

Following the BST's statistical normality, whether a functional occasion is a typical species design depends on whether it typically contributes to the individual's survival and reproduction. In other words, questioning whether a functional occasion, such as pregnancy, is a typical species design is equivalent to questioning whether it makes a typical contribution to the overall goals of the individual. This leads to circularity because assessing typicality necessitates first determining what the reference class is, and selecting the reference class requires answering whether the functional occasion is typical, leading to an endless loop.

The second criterion is the frequency of occurrence in the human life pattern, which is most *explicitly* stated by Boorse. When disputing Kingma's conflation of digestive inhibition induced by exercise and poison, Boorse argues that exercise represents a typical human activity, whereas ingesting poison does not. He further contends, "but if consuming poison were a species-typical activity—e.g., if the poison were present in a typical foodstuff—then digestive inhibition following such a meal would be considered normal by the BST and, I contend, by medicine as well" (Boorse 2014, 706). Likewise, in responding to why endemic diseases are pathological, he states: "While it may be that most humans live in malarial regions, most humans do not have malaria, nor are most children malnourished. But if such pathology were typical, then the BST would have to declare it normal" (2014, 707). These responses suggest that Boorse uses the high frequency of occurrence in the human population as a criterion for determining the typicality of a functional occasion. This criterion indeed aligns with the core of the BST—statistical normality.

By this criterion, however, pregnancy (or fertilization, specifically) is an atypical occasion. Pregnancy does not occur as frequently as routine activities such as eating, nor does it involve the entire population—only biological females, with around 8% of women of reproductive age experiencing infertility (Borumandnia et al. 2021). Moreover, for those who can conceive, pregnancy represents only a segment of life, even in areas with higher birth rates. Globally, the occurrence of egg fertilization, whether naturally or via in vitro fertilization (IVF), is relatively rare for women at any reproductive age, and the frequency of pregnancy may even be lower than that of contracting the flu or getting sunburned. In comparison, another major physiological characteristic—menstruation—meets this criterion. Similarly, puberty and aging fit, as they are life stages that most individuals experience. Therefore, if rarity is a key marker of atypical occasions, pregnancy would indeed fall into that category.

Finally, I focus on the *comparative atypicality* of pregnancy. Pregnancy is not an occasion that aligns with typical ones; most common conditions in pregnancy, unlike those temporary suppressions of functional activities that support overall function, often harm both survival and reproductive goals simultaneously, resulting in significant losses in functional efficiency. I emphasize this because it is rarely addressed in existing debates and suggests that, under current BST clauses, pregnancy cannot easily be classified as a typical occasion.

Indeed, many functional activities are performed only intermittently and, when they are active, they may inhibit other functional activities. Given this, Boorse draws a parallel

between pregnancy and other instances where some functional activities are temporarily suppressed:

> For example, a man with an erection cannot urinate; a pregnant woman is less able to run, lift, bend over, or get up directly from a supine position, not to mention experiencing normal morning sickness; a sleeping person suffers paralysis, loss of consciousness, and lower sensitivity to various sensory stimuli … all these examples illustrate a ubiquitous physiological phenomenon: the normal inhibition of one function by another. (Boorse 2014, 705)

In this parallel, pregnancy is taken for granted as a typical bodily occasion, similar to sleep or male erections. Other prominent debaters, such as Kingma (2016, 395), also tend to discuss pregnancy alongside examples such as male erections.

However, such a parallel is somewhat misleading. Pregnancy is uniquely atypical compared to other functional occasions such as sleeping or having an erection, where certain functional activities are temporarily suppressed. Four key reasons can substantiate this distinction, as outlined below.

#### *4.3.1 Lack of Unified Goals*

Drawing a parallel between pregnancy and biological occasions such as sleep or male erections equates the "inhibitions" during pregnancy—common harmful conditions such as insomnia and digestive disorders—with the temporary inhibitions of "functional activities" in those occasions, such as reduced consciousness during sleep or urination inhibition during an erection. But they are not comparable.

In these nonpregnancy occasions, associated functional activities are complementary: reduced consciousness usually benefits sleep quality, post-exercise inactivity improves blood flow to muscles (Hausman 2011, 666), and urination inhibition supports an erection—if it does not, the condition may be pathological. In these cases, the organism operates optimally within the specific "constraints" of certain functional activities.

Pregnancy, however, differs in this regard. Many common pregnancy conditions impair the gestator's survival without clearly supporting reproductive goals (as I discuss further in section 4.4). A pregnancy free from these conditions would likely be more conducive to reproduction. For instance, approximately 80% of pregnant women experience insomnia (Nodine and Matthews 2013, 370); without it, pregnancy may result in healthier offspring, because research links sleep disorders to an increased risk of preterm birth (Felder et al. 2017) and miscarriage (Lee, Gutcher, and Douglass 2014). In essence, many common pregnancy conditions are harmful to both individual survival and reproductive goals, unlike typical functional scenarios where temporarily inhibiting certain activities supports better performance in others.

#### *4.3.2 Reduction in Functional Efficiency: Pregnancy vs. Prepregnancy*

Related to reason one, the temporary inhibition of certain functional activities in nonpregnancy (typical) occasions does not decrease overall functional efficiency, while

common conditions in pregnancy often significantly reduce the functional efficiency of many parts of the gestational body compared to the prepregnancy state.

In the BST, functional efficiency refers to how well a function serves survival and reproduction, not its activity level (Boorse 1997, 559). This means that the more accurately a function's activity level aligns with the requirements of a particular occasion, the higher its functional efficiency. In typical nonpregnancy inhibitions of functional activities, there is no decrease in functional efficiency (functioning) compared to the pre-occasion state, because such inhibitions are necessary to support the performance of another functional activity.

Taking sleep as an example: suppose Lucy's consciousness level when awake is T+, contributing to her survival and reproduction at level Cw. When she sleeps, her consciousness level drops to T-, contributing at level Cs. Despite the lower activity level during sleep (T- < T+), functional efficiency remains equal (Cw = Cs) because T+ and T- are each appropriate for their respective occasions—wakefulness and sleep.

Similarly, the inhibition of urination during an erection does not reduce functional efficiency because it increases blood flow to the penis, supporting the reproductive goal without affecting survival. In other words, decreased sympathetic activity and increased parasympathetic activity are exactly what the erection situation requires.

However, we cannot say on the same grounds that common conditions in pregnancy (such as constipation, varicose veins, bleeding gums, heartburn, nosebleeds, and insomnia) are what the pregnancy occasion requires, as these conditions significantly reduce functional efficiency compared to the prepregnancy state. Consider insomnia during pregnancy: suppose Lucy's prepregnancy sleep quality results in functional efficiency at level Cs. During pregnancy, she experiences difficulty sleeping, a common condition, reducing her sleep quality to functional efficiency level Cp, which is noticeably less than Cs. This decline occurs because insomnia harms both her health (survival) and fetal development (reproduction), as discussed earlier.

Many other common conditions in pregnancy, as listed by the NHS, and resulting from childbirth similarly lead to a reduction in functional efficiency, making pregnancy distinct from other human functional occasions.

#### *4.3.3 Lasting Functional Loss: Post-pregnancy vs. Prepregnancy*

Unlike typical suppressions of functional activities that leave no lasting effects, pregnancy often leads to a long-term decline in functional efficiency. For instance, closing one's eyes temporarily does not impair vision once the eyes are reopened, nor do urination issues persist after an erection, or menstruation cause lasting harm after each cycle. In these cases, where functional activities alternate, functional efficiency remains nearly the same before and after.

However, pregnancy and childbirth often result in lasting "suppressions" and decreased functional efficiency, with almost no pregnancy entirely avoiding these effects. Nearly all women experience one or more health issues within a year postpartum—such as fatigue, back pain, sleep disturbances, and postpartum depression (Cheng and Li 2008)—with rates ranging from 47% to 94% in high-income countries (Brown and Lumley 1998). Globally, at least 40 million women are likely to face long-term health issues after childbirth each year (Vogel et al. 2024).

While some studies indicate that carrying a pregnancy to term early in life may reduce lifetime breast cancer risk, pregnancy later in life can increase the risk, and certain types of breast cancer are directly linked to pregnancy (Subramani and Lakshmanaswamy 2017). Additionally, effects such as reduced gray matter volume in the brain can persist for years (Martínez-García et al. 2021) and even decades (De Lange et al. 2019). Research also suggests that high fertility not only correlates with poorer health later in life but may also shorten lifespan (Ryan et al. 2024). Therefore, even framing pregnancy as a "temporary pathology" (Kingma 2016, 397) does not capture the full truth.

#### *4.3.4 Value-Laden Drive Mechanism*

Pregnancy is also distinct from typical biological occasions in that its occurrence is deeply intertwined with cultural, economic, and religious values.

Boorse argues that most individuals pursue survival and reproduction-related activities, neutrally guided by biology: "Not only do we want to survive and reproduce, but we also want to engage in those particular activities, such as eating and sex, by which these goals are typically achieved," and "certain physiological processes, like the heart pumping, occur irrespective of personal desires" (Boorse 1975, 60).

However, the drives for eating and sex differ in mechanisms: while hunger directly responds to survival needs, sexual desire is rarely motivated purely by reproduction, and most sexual activity does not lead to it.

More importantly, the desire for sex is not the same as the desire for pregnancy; while the desire for eating and even sexual desire might largely arise from biological drives, there is little evidence that physiological changes make women inherently "want" to become pregnant. The desire for pregnancy is almost entirely shaped by personal values, cultural norms, and socioeconomic factors. Decisions about pregnancy—whether, when, and how to conceive—are influenced by these broader contexts, making pregnancy far less straightforward than other biological functions, let alone the difference between such drive mechanisms and processes such as heart pumping, which operate independently of personal desire.

In general, based on the criteria implied by Boorse's arguments for distinguishing typical from atypical occasions, pregnancy is atypical.

### 4.4 Establishing the Pathological Nature of Many Common Conditions in Pregnancy

What reference class should be selected if pregnancy is classified as an atypical occasion? Consider four options: (i) pregnant women of the same age; (ii) all women of the same age; (iii) nonpregnant women of reproductive age; or (iv) nonpregnant women of the same age.

Recall (P2) when determining if a condition X1 in a particular occasion Y is pathological: the reference group should consist of individuals (within age and sex parameters) in the Y occasion *only if* Y is a typical occasion; otherwise, it should consist of individuals in typical occasions that are *not* Y.

Option (i), "pregnant women of the same age," is ruled out because when an occasion is atypical, those in that occasion cannot serve as the reference group. Option (ii), "all women of the same age," is also unsuitable, as it includes those in the atypical occasion (pregnant

women). Option (iii), "all reproductive-age nonpregnant women," is problematic because reproductive age spans a wide range; both 26- and 36-year-old women can reproduce but comparing the health of a 26-year-old to that of a 36-year-old is inconsistent with the BST. Thus, option (iv), "nonpregnant women of the same age," is the most suitable choice under the BST when pregnancy is classified as an atypical occasion.

Still, theoretically, at this stage, we cannot straightforwardly determine whether a common condition in pregnancy is pathological.[8] Two questions remain:

1. Is the functional decline resulting from these common conditions severe enough to be considered pathological?
2. Do these conditions potentially offer reproductive benefits?—a point that, although previously discussed, merits further examination.

The first question concerns the "degree;" a condition that results in functioning merely below average might not be enough to classify it as pathological—it must fall "more than a certain distance below the population mean" (Boorse 1977, 559). But how far is "far enough" to distinguish health from pathology? Boorse does not provide a clear answer, suggesting instead that this threshold "can only be conventionally chosen" (1977, 559).

To address the line-drawing problem, Peter H. Schwartz (2007) and Daniel Hausman (2012, 2014) propose modifications to the BST. Schwartz suggests adding "negative consequence" as a criterion for pathology, while Hausman argues that the BST should abandon a statistical explication of normality. However, since this paper evaluates pregnancy entirely within the BST, discussing these modifications is beyond its scope.

Despite the absence of a precise line, we can consider whether common conditions in pregnancy would be viewed as pathological if they occurred in nonpregnant women of the same age. Perhaps not all common conditions qualify—for instance, merely experiencing increased nausea may not be sufficient in degree even for nonpregnant individuals. But most common conditions listed by the NHS, such as bleeding gums, indigestion, heartburn, and, notably, perineal injuries from childbirth, indeed significantly exceed this threshold. Following the principle of statistical normality, if a biological occasion typically results in many conditions that significantly lower the average, with only a few being less severe, the overall set of common conditions should be considered a statistical deviation.

The second question—whether survival-harming conditions might somehow aid reproduction—was previously addressed in section 4.3, where I noted that many common conditions, such as insomnia and indigestion, compromise both survival and reproductive goals.

However, limited research and prevailing social expectations always leave room for speculation on possible benefits of these conditions. For example, some might hypothesize that vomiting protects the fetus from harmful substances, or that reduced gray matter volume helps the gestator's body more readily accept the fetus, thereby supporting maternal behavioral adaptation.

Here, I further highlight that this inclination to assume all existing traits serve a beneficial purpose has encountered substantial criticism, even within evolutionary biology. Stephen Jay Gould and Richard C. Lewontin (1979), for instance, argue that this view rests on an uncritical faith in natural selection as an optimizing force—implying that existing

[8] Thanks to anonymous reviewers for pointing this out.

traits must inherently contribute to fitness while disregarding alternative explanations for their presence. A similar critique appears in the aging discourse, where Arthur Caplan (2017, 238) contends that common age-related conditions lack purposeful function and are instead mere by-products of natural selection—a consequence of evolution's limited foresight.

In the context of pregnancy, there is little evidence to support the claim that these conditions themselves in pregnancy provide any benefit to individual reproductive goals. They may simply be epiphenomena or by-products of evolution, lacking any causal relationship to human fitness (reproduction).

Despite the above views, I leave room for future findings—suppose research eventually shows that some conditions harming the gestator's survival may support fetal development or maternal behavior to some extent. However, this would not imply that survival harms can be "offset" by reproductive benefits, as the two goals are not comparable in importance—a point I establish in the next section.

Given current evidence, most common conditions harming the gestator's survival (at least most of those listed by the NHS) offer no substantial benefit to the fetus. Within the reference class of nonpregnant women of the same age, these conditions are almost purely pathological. Even if certain "common conditions" benefit the fetus in some way, due to the incommensurability between survival and reproductive contributions (which I will argue), these conditions would still be pathological with respect to the survival goal.

In summary, section 4 examines whether common conditions in pregnancy (including childbirth) are pathological. I argue that determining whether pregnancy is a typical occasion is crucial for selecting the appropriate reference group within the BST. Pregnancy is unique: unlike other functional occasions, it compromises survival goals to achieve reproductive ones. Based on Boorse's criteria, it is challenging to classify pregnancy as typical, especially when comparing common conditions in pregnancy to temporary inhibitions of functional activities in typical occasions such as sleeping and male erections, which makes pregnancy exceptional.

As an atypical occasion, pregnancy should be excluded from the reference class, with nonpregnant women of the same age as the appropriate comparison group. Within this group, many (if not all) common conditions are statistically atypical. Even if some conditions may aid reproduction, they could still constitute survival pathologies, as the importance of two goals are not comparable—a point I discuss next.

## 5. Addressing Goal Conflict: Offset or Separate?

So far, I have established that many common conditions in pregnancy exhibit strong pathological features within the BST. Does this imply that pregnancy per se could be considered pathological? The underlying question here is: Can we reasonably prioritize reproduction over survival within the BST?

Recalling the definition of pregnancy per se, or a typical pregnancy, as a unity of "having the fetus" and a set of common conditions, the puzzle in classifying pregnancy as pathological lies in its dual nature: it compromises survival (due to these common conditions) yet fulfills the reproductive contribution. Labeling pregnancy as pathological risks ignoring its reproductive role, while declaring it non-pathological sugarcoats the many harms to the gestator as "natural." Essentially, there is a conflict of goals.

Boorse (1997, 2014) suggests prioritizing reproduction over survival to address the goal conflict. If successful, this would mean that even if most harmful conditions in pregnancy exhibit pathological aspects, they could be offset not only by their potential reproductive benefits (as discussed in section 4.4), but even more so by pregnancy's *overall* contribution to reproduction.

However, I argue that this approach is not supported by the BST itself—neither its explicit clauses nor its core principle of statistical normality justifies the superiority of reproduction.

While the BST clauses establish a hierarchy between subgoals and the overall goal—identifying "individual survival and reproduction" as ultimate goals of the organism (Boorse 1977, 556)—they do not specify a hierarchy between survival and reproduction themselves.

It may be helpful to outline how BST defines function and the highest-level goals of organisms to support later discussions. Challenging Larry Wright's evolutionary view of function (Wright 1973), Boorse argues that functional statement should depend on an organism's current structure and role, not its evolutionary history. For example, even if the penile urethra originally served solely as a sperm duct, both sperm conduction and urine evacuation are now functions because of their present contributions to overall goals, rather than their evolutionary details (Boorse 1976, 75–78).

Similarly, Boorse's identification of survival and reproduction as the highest goals is grounded not in evolutionary theory but in empirical observations: organisms adjust their behavior across environments to achieve these ends, and biological structures are organized in a means–end hierarchy directed toward survival and reproduction (Boorse 1976, 78; 1977, 556). Thus, survival and reproduction are established as ultimate goals, largely based on empirical facts about their statistical frequency of occurrence—aligning with the BST.

Could statistical normality similarly be used to establish a hierarchy between survival and reproduction? Boorse's discussion on pregnancy suggests he leans in this direction. In response to concerns about conflicting goals—such as William K. Goosens' hypothetical scenario where a species must irreversibly transform into a slug-like creature to reproduce (Goosens 1980, 112–113)—Boorse argues: "Precisely because of … the ubiquity of sacrifice by parents in reproduction—I would expect the disease concept to prefer reproduction over survival even in these hypothetical cases" (Boorse 1997, 93–94).

Here, "ubiquity" can be understood as "statistical typicality" within the BST, referring to the widespread phenomenon of organisms to invest in reproduction at the expense of survival. In fact, Goosens' hypothetical example is not even as extreme as some real-life cases—for instance, certain North American salmonids exhibit semelparity, dying after a single reproductive event (Bell 1980, 53).

However, the problem is that this phenomenon *cannot* logically lead to the conclusion that reproduction outweighs survival in the BST for a number of reasons. Firstly, the statement that reproduction often incurs survival costs does not, in itself, establish its superiority as a goal. For instance, observing that working late commonly harms one's health does not imply that working late is more important than maintaining health—unless viewed from a specific perspective, such as "meeting deadlines," where staying up late might be deemed necessary despite the health risks. From a health-preserving standpoint, however, this would not be the case. Thus, the relative importance of goals depends on the perspective from which they are evaluated.

Indeed, reproduction might be more important than survival when viewed from the standpoint of evolutionary *fitness*. The reproductive goal of an organism—ensuring the continuity of its species—might outweigh its immediate survival within an evolutionary framework (Roff 2002). However, as previously discussed and as Boorse has consistently noted (Boorse 1977, 1997, 2014), the BST assesses health and pathology independently of evolutionary history, adaptation, or fitness. This suggests that whether fitness emphasizes reproduction over survival is irrelevant to the BST's measurement of the two goals.

Furthermore, the conclusion that organisms prioritize reproduction is based on studying species that have successfully adapted to Earth's environment, not the entire biological world throughout history. Statistically, the more common phenomenon in the biological world is *extinction*—well over 99.9% of all species that ever inhabited the Earth are now extinct (Saier 2006, 135). The mass extinction of species suggests that species survival (through reproduction) has not necessarily been favored by the entire biological world. If we base statistical typicality on the entire biological and historical record, it would be just as reasonable to argue that individual immediate survival is prioritized over their reproduction.

In other words, without appealing to fitness, the BST lacks a compelling, objective basis for why an organism should prioritize reproduction over survival. As Hausman (2012, 521) rightly points out, one consequence of excluding fitness from the BST is that when survival and reproduction are in conflict, the theory offers no clear way to determine whether the organism's overall functioning has improved or declined. Pregnancy clearly exemplifies such a conflict.

Second, within the internal system of an organism, both harm to survival and contributions to reproduction during pregnancy are statistically typical *relative* to each other. This mutual statistical typicality prevents the BST from prioritizing reproduction based on statistical normality.

Pregnancy affects various internal parts of the gestator's body—some aspects harm survival, while others (particularly the uterus) support reproduction. Based on this, one could emphasize the importance of reproduction by arguing that human gestation frequently poses survival risks. Equally, however, one could argue that nature prioritizes survival, noting that, statistically, most human gestators survive the reproductive process, even without medical intervention.

Moreover, when discussing the sickle cell trait (SCT)—which causes pain, injury, disability, and infertility, but also provides a survival advantage against malaria—Boorse considers it a disease because of the universal harm it causes (Boorse 1997, 89). In other words, when survival harm and advantage conflict—as in the case of SCT—Boorse appeals to the ubiquity of survival harm to justify its pathological status. However, in the case of pregnancy, when survival harm and reproductive advantage conflict, he adopts the ubiquity of survival harm as grounds for not classifying pregnancy as pathological. If the prevalence of survival harms can be used to define conditions as both pathological and non-pathological, then it constitutes a somewhat inconsistent standard.

Third, the "harm" that pregnancy poses to the gestator's survival and its "contribution" to reproduction are quantitatively *incommensurable,* making any statistical hierarchy between them impossible.

The BST lacks specific measurement units for each goal (Thorell 2021), let alone a common unit for both. Empirical judgment may assist in measuring these respective goals.

Metrics such as lifespan or quality of life could gauge survival goals, while reproductive success might be assessed through fetal development and genetic transmission. Consequently, one can compare an individual's survival status affected by a certain condition to that of others without the condition, and similarly for reproductive status. However, there appears to be no method for comparing how a condition impacts reproduction versus its effects on survival goals within the same body system.

One might suggest using the degree of harm and achievement as a unified metric for comparison. It can be stated thus: most harm from pregnancy to a woman's survival is not life-threatening, while achieving the reproductive goal—creating a new life—is statistically absolute. In other words, from the perspective of "degree," reproduction might appear more statistically typical.

That said, this claim may be somewhat arbitrary. Pregnancy's contribution to reproduction is not necessarily absolute if reproduction is defined as the transmission of an individual's genetic code. As Boorse (1997, 24) clarifies, survival and reproductive goals are individual rather than species wide. If reproduction involves passing on one's genetic code, then a typical pregnancy—which transmits around half of the pregnant individual's genetic code—may not fully realize her reproductive goal, while the survival risk is borne solely by the pregnant individual.

Additionally, Boorse emphasizes that physicians and medical practice never categorize pregnancy itself as pathological, but instead consider the reproductive functions as normal, despite its diminution to the efficiency of other functions (Boorse 1997, 26–28). Yet, this cannot be used as evidence to prioritize reproductive goals, as Boorse repeatedly asserts that the BST is distinct from the pathology classifications used in medical practice (1977, 1997, 2014).

Therefore, neither the clause of the BST nor its statistical normality rationale provides a definitive, non-value-laden priority of reproduction over survival.

By combining the analyses from sections 3 and 4, we can draw outcomes about examining pregnancy within the BST:

1. Common conditions resulting from pregnancy are parts of pregnancy per se, as concluded in section 3.
2. The appropriate reference class for evaluating the pathology of common conditions in pregnancy is nonpregnant women of the same age. Since many, if not all, of these common conditions cause dysfunction, and there is little evidence suggesting they benefit reproduction, they exhibit pathological characteristics, as concluded in section 4.
3. Section 5 suggests that the BST cannot convincingly rank reproduction above survival. This implies that, even if future findings show certain pregnancy conditions benefit fetal development or maternal behavior, many common conditions in pregnancy still impair survival, and this cannot be offset by potential reproductive benefits or pregnancy's overall contribution to reproduction.
4. Combining the three test results, the survival cost and reproductive contribution of pregnancy per se should be measured separately. Pregnancy statistically lowers the gestator's survival level compared to nonpregnant women of the same age, which qualifies it as pathological from a survival standpoint. Conversely, its contribution to reproduction is statistically typical, meaning it is not pathological in that regard. Given the statistical independence of these two aspects, it is reasonable to conclude

that, for the gestator, pregnancy constitutes a survival pathology according to the BST.

## 6. The Future with New Reproductive Technologies

With the rise of reproductive technologies such as egg freezing and IVF, it seems necessary to briefly explore their potential implications for the pregnancy–pathology debate.

The statistical nature of the BST implies that it does not focus on how changes occur within a population but rather on whether these changes become statistically typical in human life patterns. As J. David Guerrero (2010) points out, an individual's health status could shift, not as a result of internal physiological changes but solely because of changes within the reference class. For instance, if a person has an average heart-pumping ability but others suddenly develop stronger hearts, that individual could instantly be classified as diseased. Boorse acknowledges this theoretical possibility but argues that it takes time for such shifts to become typical in human history (Boorse 2014, 715). This suggests that, as technology and medicine evolve and affect humanity's overall health profile, our assessment of what is pathological may also change.

In response to Scott DeVito's (2000) critique, Boorse further clarifies that if humans could eliminate the need for certain physiological functions, related conditions would cease to be pathological. Medicine might classify them as non-diseases, akin to conditions people might choose to alter, such as monthly ovulation or small breasts (Boorse 2014, 709). In short, for technology or medicine to change the pathology of conditions, they must alter humanity's overall functional pattern. This has two main implications for the future of pregnancy.

On the one hand, infertility and non-heterosexuality may gradually *cease* to be considered pathological within the BST as reproductive technologies, particularly ectogenesis (gestation in an entirely artificial environment), become more widely accepted.

According to the BST, infertility in women of reproductive age and homosexuality are considered pathological because of their impact on reproductive goals. Theoretically, asexuality or a lack of sexual desire (arising from psychological or religious beliefs) could also be deemed pathological, though this is rarely discussed. But if full ectogenesis becomes a common mode of human reproduction, the uterus could become an obsolete organ, much like wisdom teeth, making biological and social infertility non-pathological. This is similar to how the absence of wisdom teeth is not considered pathological today, as they are no longer necessary for chewing. Infertility could even be seen as a kind of "vaccine" against pregnancy-related pathologies.

On the other hand, pregnancy's pathological nature may persist or even intensify with new reproductive technologies.

If gestational surrogacy—where the egg is provided by the intended mother or donor—becomes a typical reproductive mode (despite ethical concerns) and reproductive success is measured primarily by gene transmission, pregnancy could increasingly be viewed as purely pathological under the BST. In this scenario, pregnancy makes a minimal contribution to the gestator's reproductive goals, while its survival-related harms remain.

Even with widespread adoption of ectogenesis, pregnancy may continue to be viewed as a survival pathology and may evolve into a reproductive pathology. If certain health risks associated with pregnancy cannot be mitigated below a specific threshold, its pathological

nature will persist. In other words, while "inability to become pregnant" might no longer be classified as pathological, "performing pregnancy" could still be considered pathological. This is analogous to how lacking wisdom teeth is not pathological but using them for chewing can lead to inflammation and pain.

Furthermore, if ectogenesis is widely adopted, potentially improving genetic transmission (such as through cloning) and ensuring better fetal health, the reproductive efficiency of pregnancy would fall below that of the reference group. Some nonpregnant women of reproductive age could employ ectogenesis and cloning to pass on their complete genetic code and produce healthier offspring, thus classifying pregnancy as a reproductive pathology.

## 7. Conclusion

Pregnancy is a double-edged sword; while it facilitates the gestator's reproduction, it harms their survival goals. Pregnancy and its resultant conditions are inseparable. These common conditions render pregnancy a survival pathology under the naturalist pathology account—the BST—despite its creator's denial.

Within the BST, pregnancy is neither a single condition nor a typical occasion. Due to the atypicality, the pregnant population cannot serve as an independent reference class or be included in the reference group. Instead, nonpregnant women of the same age constitute the appropriate reference group, rendering many conditions caused by gestation pathological concerning the gestator's survival goal. Moreover, the survival pathology caused by pregnancy cannot be offset by its contribution to reproduction, as the BST—which does not align with the evolutionary perspective—fails to provide a convincing rationale for prioritizing reproduction. Therefore, the BST supports evaluating survival and reproductive aspects separately. In doing so, pregnancy is deemed pathological with regard to survival.

Future reproductive technologies may present interesting challenges to this conclusion. Both biological and social infertility may cease to be considered pathological if pregnancy no longer depends on the human uterus, while the pathological nature of biological pregnancy may persist or even intensify.

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