How biological essentialism limits transgender people's autonomy in public policy

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Abstract

How biological essentialism limits transgender people's autonomy in public policy

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There is a growing population of transgender and nonbinary (trans) people in the United States (US) who face significant health and healthcare disparities due to a history of marginalization and discrimination, particularly in the realm of gender-affirming care and reproductive health. The current political climate is actively pursuing legislative restrictions to limit or eliminate access to these services. These limitations continue the long history of active eugenic practices, including forced sterilization for lesbian, gay, bisexual, transgender, and queer (LGBTQ+) people. These eugenic policies and practices are designed to reinforce social norms that determine who should and should not reproduce and are justified by biological and genetic essentialism--the idea that an individual's phenotypic characteristics and social identity are solely determined by their biological (genetic, hormonal, anatomical, etc.) makeup. Biological essentialism often serves as the frame of reference for public policies that limit trans individuals' access to services, public accommodations, and legal recognition. As an example, current policies in the US and abroad explicitly require that trans persons first demonstrate they are incapable of having children or have had "sex reassignment surgeries" before they may change

their legal gender marker on identification documents (IDs). The purpose of this work is to understand how a history of eugenics has led to biological essentialism that is weaponized against trans people in public policy. This study uses a social-ecological approach to investigate how eugenics limits access to reproductive healthcare for trans people in modern America at both the macro and micro level using three different datasets and analytic methods: (1) a policy analysis examining how trans individuals' capability to have children is impacted by changing legal gender marker or name on IDs; (2) multi-level analysis of survey data to identify associations between anti-trans policies and parental desire; and (3) key informant interviews with trans people about their perspectives on biological essentialism and public policy. I argue that eugenics continues to target trans people in the modern day through biological essentialism, resulting in limitations to bodily autonomy and self-determination for transgender individuals. To improve the health and well-being of trans individuals, it is first necessary to step away from medicalized and biological definitions of trans identities.

“As my friend Julian puts it, only half winkingly: “God blessed me by making me transsexual for the same reason God made wheat but not bread and fruit but not wine, so that humanity might share in the act of creation.”

― Daniel Lavery, *Something That May Shock and Discredit You*

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Chapter 1

Introduction

Transgender and nonbinary (trans) individuals are an underrepresented minority in health research and have limited access to health services due to systemic barriers introduced by experiences of harassment, violence, and discrimination.[1–5] Among these barriers are the growing number of policies being introduced across the United States that threaten and limit trans peoples' ability to access medically necessary health services, self-identify in legal documentation, participate in social activities, and operate in public spaces, amongst other limitations. These policies and other prohibitions on trans health services often rely on genetics and biology as the ultimate arbiter of a person's "true" gender. This form of biological essentialism relies on the belief that chromosomal sex or other genetic determinants, presumed hormonal composition, external genitalia presentation, neuroanatomic differences, or other biological characteristics are the sole contributors to gender presentation and identity–is not novel. Rather, it has arisen from the 20th-century eugenics movement which treated gender incongruence as a biological "disease" to be treated through medical intervention.

The ultimate purpose of my dissertation work is to explore how biological essentialism is weaponized against trans people in modern public policy, continuing a legacy of eugenic political and social practices. A secondary goal is to understand how causal theories of trans identity–supported by research that aims to find a genetic source for gender identity–impact political discourse and individuals' perceptions of their own gender identity.

To achieve these goals, it is necessary to apply a critical lens and better understand the multi-level sources of injustices faced by trans communities. With this in mind, I have developed a new framework to provide the context in which this work takes place (Figure 1). This

framework suggests that underlying violence, injustice, and inequity for trans individuals are intersecting histories of biological essentialism, medicalization, and eugenics.

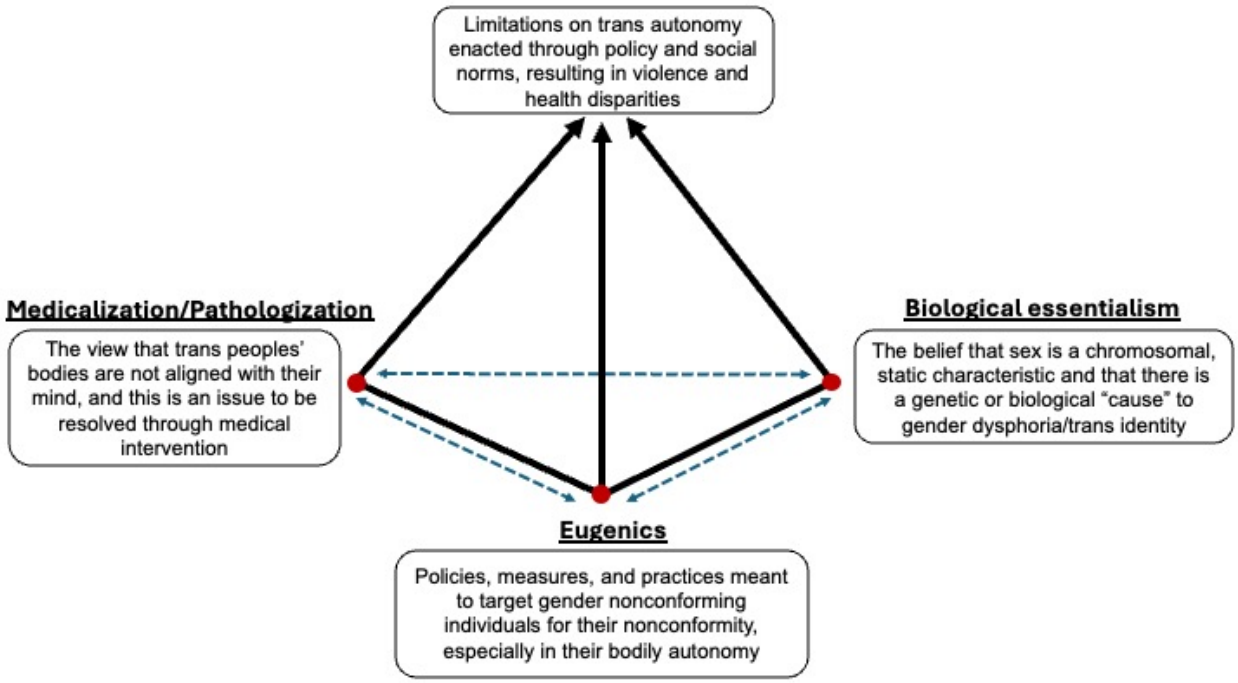

Figure 1. Theoretical model illustrating that the interconnected nature of eugenics, biological determinism, and medicalization/pathologization result in violence and discrimination against trans people.

Eugenics

In 1907, Indiana was the first state to introduce legislation enforcing mandatory sterilization.[6] Over the following 25 years, 31 additional states would follow suit.[6–8] It is estimated that 60,000 mandated sterilization procedures took place in the 20th century as a result of these policies.[6] These policies were supported through the eugenic belief that some individuals were not "fit" to reproduce, based on a variety of perceived "biological" characteristics such as race, disability, measured intelligence, and most relevant to this work, gender adherence. The term eugenics was first introduced by English scientist Francis Galton in 1883, who promoted the reproduction of "suitable" humans to "improve" bloodlines and the human race as a whole.[8,9]

From its inception, Galton's definition has placed power and supposed objectivity in determining who is deemed "suitable," for procreation, despite the inherently subjective criteria shaped by the ruling sociopolitical class. It is this suitability that will later politically define eugenics as placing inherent value on certain, not always biologically inherited, human characteristics.

There are two broad categories that characterize different approaches to "improving the human race": positive and negative eugenics.[8] Positive eugenics emphasizes who should be "ruled in" and encouraged to procreate while negative eugenics strategies aim to prevent reproduction through forced sterilization, institutionalization, imprisonment, marriage restriction, immigration control, segregation, and genocide. Negative eugenics specifically targeted groups of people including those who are queer, disabled, lower class, and people of color as a way to marginalize and disenfranchise them.[8,10] For example, in the 1910s, eugenic field workers began traveling to rural communities, collecting gossip and family histories from local community members in search of people who met the qualifications for legal sterilization and/or institutionalization through their nonconformity or feeble-mindedness.[11] Although the term "feeble-minded" was originally used to describe individuals with lower measured intelligence, it was later expanded and used to identify individuals who were atypical in terms of class, sexuality, and gender norms.[10,11] Once families with potential feeble-mindedness were identified, field workers would visit the family homes to collect their history and perform intelligence and "conduct tests." Conduct tests were deemed necessary to capture nonconformity that was not identified in intelligence tests.[11] Although regarded as scientific, these tests relied on social norms to identify "immoral" acts, such as pregnancy outside of marriage and other acts of perceived sexual promiscuity or perversion.

People who may now be recognized as trans or queer were identified through family tests. Protean definitions of eugenics since the early 20th century compounded with an evolving understanding of, and distinction between sex, gender, and sexuality complicate our ability to track eugenic strategies used to harm trans and queer individuals over time.[7] Specifically, gender identity as a construct was not adopted until the latter half of the 20th century as scientists became more interested in the psychological aspects of sex.[8] Before this, sex and gender were frequently used interchangeably; modern historians and scholars often use "gender/sex" to denote the historical lack of distinction (as I do throughout my dissertation, where appropriate). Additionally, strict and narrow gender norms misclassified gender nonconforming individuals as homosexuals, "sexual deviants", or "sexual inverts." Transvestitism, which was historically applied to individuals who would cross-dress, was seen as a "common form of homosexuality."[11] Transsexual, on the other hand, was a term used to pathologize and demoralize trans identities. Although it is beginning to be reclaimed by some trans individuals, its use outside of trans communities is widely condemned. Other terminology used by eugenicists to characterize individuals who now would broadly be described as members of the queer community includes: perverts/perversion, gender variant, gender incongruence, urning (a term used to describe a "female mind in a male body"), and third sex (describing homosexuals as being a midpoint between "femaleness" and total "maleness").[7,8,10] Additionally, by labeling trans and queer individuals as "sexual deviants" and "perverts," they are grouped with heterosexual individuals who have committed sexual assault and pedophilia. Without knowing the specific details of a case, it is difficult to ascertain whether an individual with these labels is gender nonconforming in historical texts.[11] While it is therefore difficult to estimate the number of trans people who have been affected by eugenic measures during this time, several specific examples have been

documented where individuals were targeted exclusively for their gender nonconformity.[7,11] Eugenicists believed all these terminologies describe individuals afflicted with an innate form of low intelligence and irresponsibility and supported acts to limit their reproduction.[11]

Records from eugenic field workers have described women who were "extremely masculine in appearance", men who showed "sexual peculiarities" for never having been in a romantic partnership with a woman, and men who were "simple-minded" due to their preference for activities that fit within feminine gender norms. Individuals who were identified through these methods were reported to the state and susceptible to state-mandated sterilization.

As field workers' interest in identifying and categorizing all types of "gender variance" grew, several policies were introduced to enforce these eugenic ideals. Sodomy laws, developed in the early 1900s and continuing for more than 100 years, condemned queer sex and conflated homosexuality with other forms of sexual deviancy, including pedophilia.[12] Laws criminalizing cross-dressing often resulted in the imprisonment of trans people and continued in some states through the 1950s and 1960s. Nearly all (94%) cross-dressing cases resulted in insanity verdicts and involuntarily commitment to asylums and hospitals for treatment.[13] Other policies broadly targeted sexual deviancy or inversion. For example, both Oregon and Washington had a considerable number of residents who were institutionalized due to their sexual deviance, many of which were men who were caught having sexual relationships with other men. Once individuals were institutionalized, they were vulnerable to treatments determined by the state.[14] For some, this meant experimental medical treatments. For others, this meant sterilization or total castration. Many of the patients in asylums and hospitals were offered sterilization in exchange for freedom.

A specific example is the case of Maria Ramirez, who in 1940 was institutionalized for simply walking in someone's yard with flowers in her hand.[15] Due to her gender incongruence, she was deemed a "sexual invert" and a danger to others. The letter recommending her for sterilization claimed she suffered from "Psychopathic Personality with Psychosis," citing the fact that she admitted to "being a passive sodomist, wearing feminine clothing, using lipstick and other feminine devices."

It is now acknowledged by German courts that trans people were targeted by Nazis during World War II (WWII).[16] The most well-known example is the burning of records at the Institute for Sexual Research (IfS) in Germany.[17,18] IfS was founded by Magnus Hirschfield, an openly gay, Jewish scientist who studied queer identities. Notably, Hirschfield used his research to promote civil rights for queer individuals in Germany and promote access to medical and social resources for trans people. In 1907, he supported a trans man who applied to legally change their name and wear masculine clothes in public.[17] Following this, other trans individuals would receive permits to wear clothes of the opposite gender in public spaces. However, these were later revoked when Hitler came to power.[16] Hirschfield's work played a large role in the decriminalization of trans identities in Berlin in 1922.[17] IfS was also the site for some of the first gender-affirming surgeries and cofounded a secondary organization to support trans rights.

In May of 1933, IfS was looted by Nazis and the materials and books that were confiscated from the institute were publicly burned. Later, there are several documented accounts of trans people being sent to concentration camps, identified by the permits that allowed them to wear clothes of the opposite gender in public. There is no single consensus on why trans people were targeted by Nazis, aside from the belief that their gender incongruence was threatening. However, the destruction of records and the harms that followed were successful in committing

"memoricide"–the act of destroying memory as a means to "dispossess an individual or a group of their main tool for giving sense to their present [and] building… their future."[17,19,20]

Memoricide brings to attention the distinction between active versus passive eugenics, a distinction first introduced by James E. Bowman in 1996.[21–23] In Bowman's framework, active eugenics includes both positive and negative strategies (laws, policies, and practices) that explicitly aim to promote or limit the reproduction of certain groups of people based on the desirability of their social, psychological, and/or biological characteristics.[22] Passive eugenics is more subtle and uses covert measures to achieve the same result. Laws and policies that use passive eugenics may use coded or cloaked language. Practices may stem from societal norms. In this historical example, the act of memoricide committed by the burning of IfS records may be considered passive eugenics while the later incarceration and castration that would take place in concentration camps would be considered active eugenics. Other scholars have applied the term to reproductive justice for trans individuals, providing examples such as a lack of policies that would financially support assisted reproductive technologies and fertility preservation for trans individuals and policies that require sex reassignment surgeries for trans individuals wishing to change their name or gender marker on legal identification documents.[14,21,23]

World War II also marked a shift in eugenic paradigms. "Mainline" eugenics captures a time from the early 1900s up to WWII, where the rationale for eugenic ideologies, policies, and practices centered on biology.[8] "Reform" eugenics, taking place from WWII through the 1970s, included theories from sociology, sexology, demography, psychoanalysis, anthropology, and endocrinology in addition to biology and genetics. This marked a departure from Mendelian genetics, which relied on a single-gene model of inheritance, to heredity being multifactorial and polygenic. Additionally, with reform eugenics came an influx of positive eugenic strategies

including maintaining the nuclear family structure, particularly through the advent of marital counseling, baby bonuses, and restricted access to assisted reproductive technologies.[7–9,14] A particularly relevant feature of reform eugenics is the decentering of race as a eugenic target and shifting to gender and sex. Notably, Western perceptions of sex and gender are racially coded, such that non-European women are masculinized for having a gender presentation that is not in line with White supremacist ideals. The distinction between mainline and reform eugenics is often blurred. However, the negative practices associated with mainline eugenics persisted alongside positive strategies emphasized during the reform era—both of which continue in various forms in the present day.

The American Institute of Family Relations (AIFR) was developed in 1930 by Paul Popenoe with the positive eugenics goal of promoting the reproduction of individuals with perceived desirable traits.[8] The AIFR spread its message through mainstream media (i.e., radio shows and print media), describing what a desirable American marriage should look like. In these conversations and in counseling directly through the AIFR, Popenoe dedicated considerable attention to the differences between males and females, which he believed to be based on evolution, nature, and genetics. Under the guise of marriage counseling, therapists at AIFR measured and clinically enforced strict gender norms, especially for women. Gender adherence was measured by AIFR counselors using two measures: the Johnson Temperament Analysis Test (JTA) and the Terman-Miles Male-Female Test (M-F Test).[7,8,14] The former was developed by AIFR and measured several aspects of personality. Women were expected to have less dominant and harsh personalities, and when they scored outside of a normal range, they were advised to become more docile to solve their relationship issues. The M-F Test was developed in collaboration with Lewis S. Terman, a eugenicist who helped develop an official

measured intelligence test (Stanford-Binet Intelligence Test). The M-F Test's primary intent, as defined by Terman, was to identify gay men in heterosexual relationships who could be treated for their gender deviance. In exchange for providing the test to the AIFR, the institute would give Terman access to the results so he could investigate how marital happiness related to gender alignment.[24]

The heterocisnormative ideology perpetuated by the AIFR– that women were "biologically made" for marriage and caring for a husband–was primarily enforced among clients who were women. When people with problems in their marriage came to AIFR, the wives were advised to accommodate the needs of their husbands, and the masculine woman was seen as a threat to the nuclear family structure. Once identified by JTA and M-F tests, women who fell outside of socially accepted gender norms were counseled to change their behavior, demeanor, or appearance to better fit in the heterocisnormative marriage script of the time. Black women, and Black lesbians in particular, were a strong target of eugenicists who wished to enforce strict gender norms to maintain social order and separate white families from Black families.[7,11] Nayan Shah describes the advantages provided to the American nuclear family as a material benefit of Whiteness.[25] The idea that Black mothers or parents were unfit or absent, in part due to their perceived deviance in breaking gender norms, led to the development of an additional theorized source of transsexuality popular amongst psychoanalysts during this time. The "mother theory" postulated that the absent mother created a masculine and deviant daughter while the overbearing mother created an effeminate and deviant son.[13] In this view, being trans is the result of unfit parents and parenting missteps that could be traced through the family tree. The mother theory was also applied to white mothers who were counseled at AIFR, should their child be perceived outside of traditional gender norms.

Current policies and practices continue to limit trans people's autonomy and criminalize their existence in day-to-day life, oftentimes borrowing language from the eugenic handbook. Throughout the country, political and social attacks on the trans community include criminalizing gender-affirming healthcare for trans youth (and attempts to do the same for trans adults), bans on discussing sexual or gender identity in schools, redefining of "sex" in ways that allows trans (and intersex) people to be written out of anti-discrimination policy, and bans on performing drag in public spaces. The intent of these policies is framed by transphobic policymakers as an attempt to protect children from "sexual predators" and "grooming," reminiscent of the motivation eugenicists used throughout the 20th century to target trans people. Additionally, policies regarding legal gender markers on identification have often been used as a eugenic strategy. Some countries in Europe require that trans individuals must be "definitely incapable of reproduction" or unmarried in order to change their legal gender marker.[14,23,26] In Sweden, a similar policy has been repealed; yet, there are lingering worries, especially for transmasculine people who become pregnant and go through childbirth who report fear that their medical providers would subject them to non-consensual sterilization while they are giving birth.[27] While US policies do not use this explicit language, several states–even some regarded as having more trans-friendly political environments–require a doctor's note stating that an individual has had the appropriate treatment to be aligned with the gender on their ID, creating opportunities for increased accessibility barriers and medical gatekeeping. Further, gamete cryopreservation remains unavailable to trans patients in many countries,[28] which has been called out by trans activists as a form of passive eugenics.

Medicalization and Pathologization

Both medicalization and pathologization are relevant to trans people's mistreatment by the medical system.[29] However, they call attention to different matters (although closely intertwined with one another). Pathologization refers to the treatment of trans-ness as a disease which, in turn, is used to justify subjecting trans people to marginalization, institutionalization, sterilization, and other eugenic measures. Medicalization refers to how conditions are defined in the jurisdiction of medicine and how they can be treated by medical professionals; in this instance, how trans-ness should be "cured". Medicalization/pathologization of the trans experience establishes medical professionals as the arbiters of truth and gatekeepers to health services. Pathologization, on one hand, manifests in assumptions that trans individuals' minds are not biologically aligned with their bodies, while medicalization, on the other hand, posits that medical and/or surgical interventions are the "correct" course of action to address this incongruence.[30,31] As a current example, in most states trans people must first establish 6 months of care with a psychiatrist and receive a Diagnostic and Statistical Manual of Mental Disorders (DSM)-5 diagnosis of "gender dysphoria" before being eligible for gender-affirming care.[32] The diversity of lived experiences of trans people has never been reflected in the narrow, medicalized construction of what it means to be nonnormatively gendered,[14] and perpetuating this discourse has directly impacted trans people's access to health services.

In the early 20th century, there were several proposed treatments for transgenderism, ranging from sterilization and castration (discussed above), to electric shock therapy, and experimental hormonal treatments.[7,13] The temporal lobe and the hypothalamus were both suggested to be the origin of sex deviancy and inversion, and targets for electric therapy.[7] The treatment was justified by *Lancet*, the official publication of the British Medical Society, who said that "castration is open to criticism on ethical grounds while psychosurgery is not."

Additionally, it was proposed that sexual deviancy was the result of a genetic predisposition that caused hormonal differences in affected individuals. The suggested treatment was then experimental hormone therapies, which were intended as a form of "chemical castration." For this form of hormonal treatment, individuals were given stereotypically female hormones to reduce their sex drives and therefore their deviant tendencies. Later, in the 1930s and 40s, experimental hormonal therapies were used to increase gender adherence; for example, young effeminate boys were given testosterone therapy to make them more masculine in gender presentation. These experiments were reported to be successful in treating gender nonconformity. The treatments were developed as scientific advancements were occurring in the fields of genetics, endocrinology, and neuroscience.

The medical discourse on the treatment of transgenderism continues into the modern day primarily through the identification of gender identity disorder (GID) and gender dysphoria (GD) as psychiatric diagnoses. In the first version of the DSM, "transvestism" was grouped with homosexuality and other perceived forms of sexual deviancy (pedophilia, fetishism, etc.).[11] While homosexuality was removed from the DSM in 1973, GID was added in the 1980s.[13] This was a result of the first gender clinics in America, from the 1960s to the 1980s, which aimed to find a psychological cause for trans identity. During this time, there was a heavy emphasis placed on finding a biological and/or psychological cause for transsexuality. When this search failed, providers at these clinics moved towards potential treatment options, which would later become the standard of care for the treatment of gender identity disorder. GID was later replaced by GD with the publication of the DSM-5 in 2013.[33] The change was intended to destigmatize the experiences of trans people by describing psychological symptoms resulting from experiences of trans people living in the "wrong body" rather than naming the identity itself as a

psychiatric illness. Still, the presence of GD in the DSM-5 reinforces the medicalization/pathologization of trans people by describing GD as a problem to be treated through medical intervention.

Importantly, in the early days of gender clinics, not all patients entered voluntarily. Patients came from hospitals and prisons, especially while treatments were still considered experimental.[13] The patients–who were largely poor, people of color–established the foundation for theories of, and treatment for, "transsexuality." As a result of the addition of GD to the DSM, trans people who wish to pursue gender-affirming hormones and surgeries must first receive a psychiatric diagnosis. In the current political climate, this is often a privilege that is more readily available to more affluent individuals as it takes a significant amount of resources to establish care with a clinician who will provide a diagnosis, for patients to cover the out-of-pocket cost of medical care, and take time to undergo and recover from surgeries. Thus, through the medical model of disability, gender dysphoria is a label used to stigmatize and target the experiences of individuals with intersecting identities and to grant access to gender-affirming services for more privileged populations of trans people.

Biological and genetic essentialism

Biological essentialism refers to the idea that our identity and traits are intrinsic, objective, and solely biological, while genetic essentialism is the narrower view that identity and traits are solely determined by genes.[34–37] Both act as dominant discourses in science, medicine, and public health, which center DNA as the "blueprint of life" and reinforce the idea that genomic information, coming from biological source material, serves as the "objective truth" in determining an individual's identity. This simplistic view of genetics overlooks the complexity of gene-environment interactions and polygenic and social contributions to the development and

expression of traits.[10] It also perpetuates beliefs and stereotypes that are harmful to marginalized communities by wrongfully pointing to perceived biological differences between groups.[36,38] Still, this frame has supported and justified eugenics laws and practices for over 200 years[7,8] and as science, genetic research, and our understanding of sex and gender have evolved, biological essentialism and its impacts on trans people have shapeshifted as well.

The discovery of sex chromosomes in the early 20th century led to the development of theoretical models of sex development and differentiation as well as the search for causal genes for the development of secondary sex characteristics.[33] It was proposed early on that transsexuality was the result of a combination of differences in hormones (caused by genetic variation) and the environment.[13] Additionally, differences in hormones could be associated with hypothalamic dysfunction, which would then lead to gender variance.[7,13] It was hypothesized that gender variance caused by genetics was an incurable, unstoppable biological source–labeled the "X-force"–that destroyed sex hormones within the bodies of trans individuals.[7] Other scientists and physicians noted that the further the scientific community investigated the origins of biological sex, the more complex the picture became. Harry Benjamin, a German endocrinologist, specified, "[o]rdinarily, the purpose of scientific investigation is to bring more clarity, more light into fields of obscurity. Modern researchers, however, delving into 'the riddle of sex' have actually produced–so far–more obscurity and complexity."[13]

The development of the field of behavioral genetics is the predecessor of much of the research that looks for a genetic source for gender identity today. Behavioral genetics refers to research with aims to link genetic correlates to complex, socially defined behaviors and traits.[39] The 'first law' of behavioral genetics is that "All human behavioral traits are heritable",[40] and largely this heritability has been assumed to be genetic. It has been used to explore genetic

correlates for educational attainment, religious affiliation, and political beliefs, among others, which have both suffered from a lack of replicability and ethical shortcomings.[41]

Although research looking for a genetic source for queerness is not by any means new, behavioral genetics research sensationalized this search, launching it into the cultural zeitgeist. The original "gay gene" study by Dean Hamer was published in *Science* in 1993 and suggested a correlation between genetic loci Xq28 and homosexuality in men.[42] The authors concluded that they had "produced evidence that one form of male homosexuality is preferentially transmitted through the maternal side and genetically linked to chromosomal region *Xq28*." However, after its publication, the study methodology was greatly criticized.[34,43] Not only was there a lack of a control group, but also the linkage analysis was based on only 40 cases, the majority of which were not direct measurements but estimates based on known frequencies in available datasets. In addition to methodological concern, ethicists were concerned about the potential harm to the LGBTQ community caused by this research. Primarily, there was concern that finding a genetic marker for sexual orientation could lead to selective abortions for fetuses with that marker, promoting eugenic ideals. To reduce the potential harm from this type of work, a review following Hamer's original Xq28 paper promoted the responsible conduct of behavioral genetic studies by suggesting that genomics research on sexual preferences should use rigorous methods that include: 1) reporting valid and precise measures of individual-level differences, 2) employing appropriate methods to ascertain biological relationships, 3) randomly recruiting participants, 4) using appropriate sample size, 5) conducting appropriate genetic models to interpret the data, and 6) exercising caution in interpreting biosocial effects from the observed phenotypic correlations.[44] Doing so would strengthen the study methodology and the ability to

draw conclusions from the study results; however, a more recent review found that no study on this topic had met all six of these criteria.[34]

To this day, the results of Hamer's original work have never been replicated, but have supported the motivation to continue the body of research that aimed to look for genetic correlations with sexual identity.[45,46] Several twin studies have been conducted to estimate the heritability of homosexuality, concluding that 60% of the variation in same-sex sexual behavior is explained by genetic differences. The first genome-wide association studies (GWAS) investigating sexual orientation was published in 2013, and identified genes related to prenatal sex hormone signaling and finger length.[34,47] One of the largest studies used data from the UK Biobank and 23andMe to perform a GWAS for individuals who had ever participated in same-sex sexual behavior.[48] Importantly, this study largely concluded that "there is no gay gene", rather sexuality is likely polygenic and influenced by environmental factors.[45,48]

Despite its inability to be replicated, Hamer's paper was widely accepted and celebrated by both the broader genetics community and within queer communities. This enthusiastic reception signaled several troubling dynamics: a readiness to apply biological essentialism to marginalized populations echoing a harmful historical pattern; the pathologization of queer identities; widespread misunderstandings of genetics among the general public; and a conflation of biology with genetics. The timing of the research likely contributed to its popularity as well, as it emerged during the early phases of the Human Genome Project—a scientific endeavor that, while advancing genetics research, famously overpromised its potential to serve the public good. Moreover, the medicalization of queer identities was not solely driven by Hamer or his peers, but also by how their findings were framed in press releases from scientific journals and amplified by mainstream media.[46] Now, all biological research searching for a source for queer identity,

whether it has a genetic dimension or not, is likely grouped under the "gay gene" umbrella in pop culture. Ultimately, this research helped solidify the "born this way" narrative, embedding the notion of a genetic basis for queerness into conventional wisdom.[34,46]

The search for genetic correlates of same-sex sexual behavior has extended to a search for the genetic basis of trans identity. Studies investigating a genetic source for gender identity have encountered similar methodological issues, particularly around replicability.[49,50] Twin and family studies were among the first to explore genetic associations for trans identity, generally suggesting some degree of heritability, though exact estimates vary. Karyotyping studies of trans individuals, which aim to identify variations in sex chromosomes, have largely yielded insignificant findings. However, one study reported a higher frequency of Klinefelter syndrome (XXY chromosomes) among trans women compared to cisgender men. Candidate gene studies, often guided by the Prenatal Androgen Hypothesis—which posits that variations in fetal androgen exposure influence gender identity—have examined genes related to hormone receptors. Yet, as of 2022, none of these candidate gene studies had been successfully replicated. More recent research has employed whole exome sequencing (WES). Some WES findings suggest potential associations between hormone receptor genes and gender identity development, though these results are limited by small sample sizes.[51] Overall, this line of research remains in its infancy, and time will tell whether current findings withstand the test of replicability.

The most extensive body of work investigating biological differences between cisgender and transgender individuals exists in neuroscience. Although this field also struggles with replicability, some evidence suggests that individuals with gender dysphoria may exhibit functional neurological differences in brain regions associated with body perception.[50] However, in both genetic and neurologic studies, measurement of trans identity across studies is

inconsistent where some rely on self-identification and others use clinical diagnoses of gender dysphoria, making it difficult to compare results meaningfully.

This body of research, and the broader "born this way" narrative popularized by LGBTQ+ activists in the latter half of the 20th century, promote the idea that identifying biological differences between trans and cis people could legitimize trans identities by grounding them in biology and thus, in so-called "objective" truth that can both support and undermine identity claims. As a result, when a person self-identifies as trans, their claims may be viewed as less legitimate in the absence of biological evidence, undermining trans people's autonomy and right to self-determination. Some researchers argue that identifying polygenic influences on gender identity could help affirm its complexity and nonbinary nature.[49] Still, preliminary findings suggest trans communities are cautiously optimistic about this work. A recent survey of trans adults indicated that many believe there may be a genetic component to gender identity and that discovering it would benefit trans communities.[52] However, in-depth qualitative studies reveal more nuanced perspectives; while some trans individuals see the potential benefits of this research, many also express concern about how it could be used to discriminate against trans people or restrict access to care.[36] In *American Eugenics: Race, Queer Anatomy, and the Science of Nationalism*, Nancy Ordover cautions against relying on causal research to solve what are fundamentally social and political issues. She writes, "Of all the groups targeted by biological determinism, queers seem to be the only ones who have looked to eugenics to deliver us from marginalization."[7]

Summary and Specific Aims

As of May, 914 anti-trans bills have been introduced in the US in 2025 that aim to limit trans people's autonomy and criminalize their existence in day-to-day life,[53] oftentimes

borrowing language from the eugenic handbook. Throughout the country, political and social attacks on the trans community include criminalizing gender-affirming healthcare for trans youth (and attempts to do the same for trans adults), bans on discussing sexual or gender identity in schools, redefining of "sex" in ways that allows trans (and intersex) people to be written out of anti-discrimination policy, and bans on performing drag in public spaces. The intent of these policies is framed by transphobic policymakers as an attempt to protect children from "sexual predators" and "grooming," reminiscent of the motivation eugenicists used throughout the 20th century to target trans people.

These policies and other prohibitions on trans health services often rely on genetics and biology as the ultimate arbiter of a person's "true" gender. For example, in Florida's 2023 legislative session, state representative Webster Barnaby likened transgender people to "mutants from another planet" while arguing in favor of a bill that would make it a crime for transgender people in Florida to use public restrooms consistent with their gender identity.[54] That bill went into effect in July 2024, and required trans people to use bathrooms aligned with their "biological sex", defined by one's ability to produce eggs or sperm.[55] In addition to bathroom bans, national-, organizational-, and school-level policies describe "biological advantages" held by trans athletes to prevent their participation in sports and state- and federal-level policies have redefined sex based on someone's reproductive tissue or anatomy, citing the "biological reality of sex" that trans people are supposedly ignoring.[56,57] There have also been policies introduced in state legislatures, though not passed, that would require genetic testing to verify sex chromosomes to ban trans students from participating in sports and prevent state funding for institutions that support trans people.[58]

At the same time, pro-trans political arguments use biological language to promote civil rights for queer people, and broader conceptualizations of sex have been successful in securing political rights for trans people.[59] Additionally, "causal theories" that support biological or genetic sources for trans identities are personally validating and many believe they could be persuasive in swaying public opinion about trans people.[52] The use of biological essentialism by both pro- and anti-trans advocates conceptualizes "sex" as a site of political struggle,[33] where one side narrowly defines it as an immutable characteristic and the other argues for an expanded definition that considers sex within larger cultural, social, and political contexts.

My dissertation considers the political and structural violence that trans people face today in the context of a history of eugenic practices that have, in turn, influenced how we apply biological essentialist frameworks to queer identities. While this work is, in some sense, about identity politics in that I explore how trans people conceptualize their own identity in the context of causal theories for trans identity and an evolving political environment, it is also informed by tenets of reproductive justice and disability studies.[29,60] Namely, it is about bodily autonomy, informed consent, and the right to self-determination for historically and presently marginalized communities that can only be achieved through the depathologization of trans identities. My research questions were inspired by and developed from the framework that I have introduced in this chapter. Specifically, each chapter explores at least one of the three discourses I have introduced here, sometimes highlight the nature in which they cannot be disentangled from one another.

The overarching goal of this work is to characterize how a history of eugenic political and social practices has led to present-day biological essentialism that is weaponized against trans people in public policy. The next chapters each use a unique methodology and dataset to

explore different aspects of my framework, and how biological essentialism, eugenics, and medicalization all work together to perpetuate discrimination and health inequities for trans populations.

Chapter 2: A Unique and Unnecessary Burden: A Critical Discourse Analysis of US Policies for Legal Gender/Sex Marker Changes on Identification Documents, summarizes how changing legal gender markers on identification documents (IDs) impacts trans people's ability to have biological children. I used a critical discourse analysis approach to examine state-level US policies regarding gender marker changes on IDs (i.e., birth certificates and driver's licenses) with particular attention to how and when policies invoke concepts genetics and biology to describe gender and sex, and to the inclusion of medical procedures and medical authority or evaluations that trans people must undergo to "prove" their identity and access legal gender labels that align with their understanding of self.

Chapter 3: Structural Equation Modeling Identifies Healthcare Avoidance as a Mediator Between Policy and Parental Desire Among Transgender Adults in Washington State, tests two structural equation models (SEM, designed from the Washington State Priority Assessment in Trans Health's survey dataset) that hypothesizes the multi-level relationship between anti-trans policies and healthcare access, social support, and desire to become a parent in the future. Data for this aim comes from the Priority Assessment in Trans Health Study survey, which collected data on social, mental, and physical determinants of health among trans adults in Washington state in the spring of 2023. Using SEM, I will test two theoretical models that propose parental desire is influenced by interpersonal, institutional, community, and policy level factors. I hypothesize that (1) national anti-trans policy awareness is negatively associated

with parental desire and (2) state-level protective policy awareness is positively associated with parental desire.

Chapter 4: Vilifying or validating? The political impact of biological essentialism, explores how perspectives on trans identity genomics research are influenced by the current political environment. This analysis used a qualitative dataset from the Trans/Forming Genomics Study, which aims to develop guidelines for genomics researchers on how to work with trans populations while maximizing benefit and minimizing harm. My primary research questions for that informed this analysis were: (1) How is biological essentialism weaponized against trans people in public policy?, (2) How does TIGR validate/invalidate trans identities?, and (3) How are macro-level discourses about trans people in public policy internalized at an individual level?

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Chapter 2

A Unique and Unnecessary Burden: A Critical Discourse Analysis of US Policies for Legal Gender/Sex Marker Changes on Identification Documents

Introduction

Transgender and nonbinary (trans) individuals are underrepresented in health research and have limited access to health services due to systemic barriers introduced by harassment, violence, and discrimination.[1–4] Explicit discrimination against trans people is written into numerous laws and policies, with 658 anti-trans bills considered in the US in 2024.[5] These bills target access to gender-affirming healthcare, public accommodations, identification document (ID) changes, and more. The increase in anti-trans legislation is associated with poor mental and physical health outcomes for trans individuals.[6,7] In addition, the recent rise in legislation continues a long history of political violence targeting trans individuals that has resulted in imprisonment, institutionalization, and forced sterilization. It reflects the limitations governing bodies have placed on trans people's autonomy and human rights.[7,8]

One of these policy categories, legal gender/sex marker changes on IDs, has historically been used to limit self-identification and access to public services and accommodation for transgender people.[9,10] Notably, sex and gender are distinct concepts with sex referring to the categorization of individuals based on biological characteristics (eg. hormones, reproductive organs, external genitalia, and chromosomal composition) and gender referring to the categorization of individuals based on cultural and social bound conventions, roles, and behaviors. Here, I will use the term "gender/sex" in the context of identification document policies to reflect the conflation and misidentification of sex and gender in public policy as well as the interconnected nature of these two concepts.[11,12] At the national level in the US, there were previously no prerequisites to legal gender/sex changes on passports and social security cards.[13] However, state governments hold jurisdiction over driver's licenses and birth certificates and have a wide range of policies surrounding the requirements to change legal gender/sex markers. Some of these policies (such as those in Montana, Tennessee, etc.) indicate trans individuals

must undergo surgeries or medical procedures in order to change their gender/sex marker, which often results in infertility or has an uncertain impact on fertility.[13,14] Moreover, while legal gender affirmation is associated with positive mental health outcomes for trans individuals,[15–17] it has historically been barred or limited by medical requirements, including that trans people be incapable of having children before being able to legally affirm their gender.

Discourse refers to practices and beliefs that systematically shape our individual and shared realities. Discourse analysis (DA) is used to examine how language and vocabulary are used to accomplish social, political, and personal goals within and across social structures and time.[18–21] In doing so, it examines how language in a selected text is used to create identities, actions, and assumptions. Critical discourse analysis (CDA) is used to ask not only how language is used to define these objects but also how language is used to sustain and enact power imbalance.[22] Policy is particularly relevant to CDA because of the innate and systematic power the state holds over its constituents via enforcement of legal language. Moreover, the language used in policies is a discursive site of struggle for social power between competing and unequal interests.[23] The use of CDA not only identifies these power imbalances but also draws attention to potential resolutions. It also allows us to describe how these discourses are enacted by language found (and not found) in these policies.

This analysis utilized critical policy discourse analysis to investigate how the language used in legal gender/sex marker policies calls on three deductively identified master discourses: eugenics, medicalization, and biological essentialism. Eugenics, the pseudoscientific movement that gained popularity in the United States (US) in the early 20th century, has resulted in the sterilization of at least 60,000 people nationally – largely individuals who are BIPOC, queer, disabled, and lower socioeconomic status.[24] Medicalization in this context refers to the idea that

trans people's bodies are misaligned with their minds, and this is a problem to be fixed through medical intervention.[12,25] Medicalization of trans individuals was made possible through the search for a biological source of gender, an extremely popular scientific question by eugenicists in the latter half of the 20th century. Genetics was proposed as a biological source of gender and gender dysphoria in two senses: (1) through the discovery of the sex chromosomes and the idea that men have XY chromosomes while women have XX chromosomes and (2) through studies that seek a genetic cause for transgender identity. The views that individuals are transgender due to a genetic origin and that individuals' gender is defined solely by their chromosomal sex are forms of biological essentialism. By performing CDA I can ask not only how language is used to define these policies but also how language is used to sustain and enact power imbalance. What will become evident through close evaluation of the language in these policies is the negotiations between trans persons, their medical providers, and the government in recognizing their gender identities and their reproductive capacities.

Methods

This analysis utilized critical discourse policy analysis to investigate how the language used in policy calls on the master discourses of eugenics, medicalization, and genetic essentialism to limit trans individuals' reproductive freedom. The use of CDA not only identifies these power imbalances but also draws attention to potential resolutions. CDA is the appropriate methodology for the research questions at hand because of its focus on how language is shaped by historical and political context and how that language is then used to maintain power imbalances and social inequalities.

Data collection

Policies in effect related to changing gender on state-level identification documents from each state were collected between January and February of 2023. The dataset was reviewed for relevancy in March of 2024, and states with policy changes in effect during that time were updated. There were no limitations on policy year, and the year listed reflects either the year the policy was enacted or the most recent year the policy was amended. Policy names and documents were obtained through repositories created by the Movement Advancement Project (MAP)[14] and Advocates for Trans Equality (A4TE, formerly the National Center for Transgender Equality).[26] MAP is a nonprofit organization that collects and summarizes policies that impact LGBTQ+ populations as well as policies on voting rights. A4TE collects policy and individual level data on trans populations, informing their advocacy in protecting trans rights. Policy documents were either gathered directly from these sources, from state government websites, or Westlaw, depending on availability. Codified policies as well as cases (which resulted in case law), official memos from government offices, senate bills, house bills, and executive orders were included in the analysis.

Data organization

I scored state policies based on five criteria: (1) whether they mentioned genetics in their policies, (2) if they required provider verification of surgeries or other medical treatment in order to change gender marker, (3) if they did not have an 'X' gender/sex option on either birth certificates or drivers licenses, (4) if the state required surgical procedures as a legal-medical prerequisite to change gender/sex markers, and (5) whether the state barred gender/sex marker changes on either birth certificates or drivers licenses altogether. An average of the scores of policies from each state was calculated, and average scores ranged from 0 to 3.5 with 0 being the

least restrictive policy environments and 3.5 being the most restrictive. I then categorized states based on their scores into four categories: positive (0-0.99), fair (1-1.99), low (2-2.99), and negative (>3).

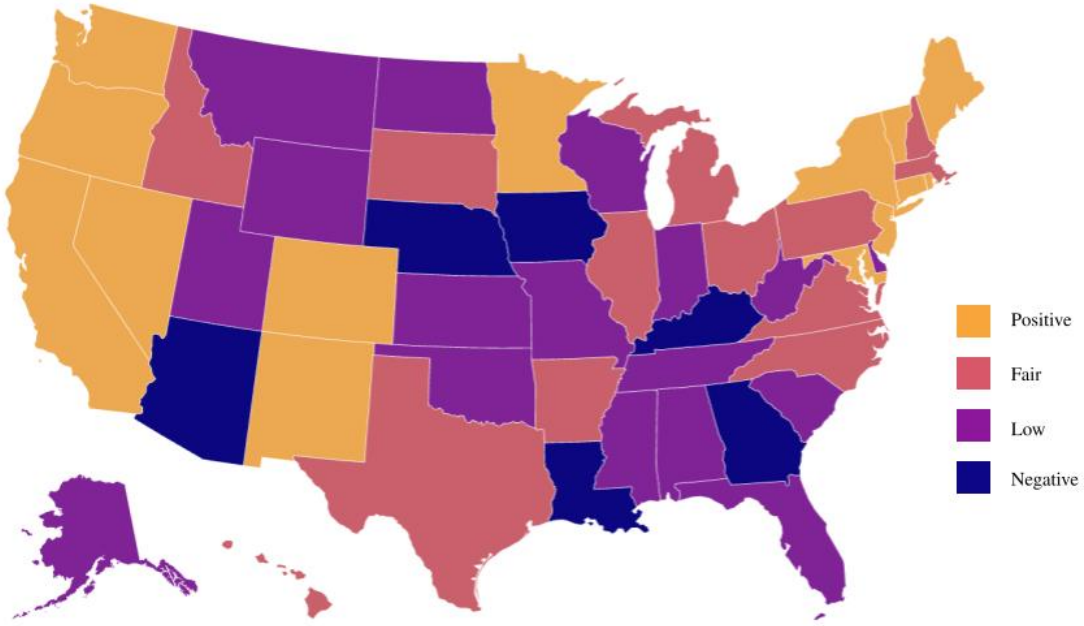

Figure 1. States rankings based on gender marker policies, scored based on: (1) whether they mentioned genetics in their policies, (2) if they required provider verification, (3) if they had an 'X' gender/sex option, (4) if the state required surgery, (5) whether the state barred gender/sex marker changes altogether. Scores ranged from 0 to 3.5 with 0 being the least restrictive and 3.5 being the most restrictive. States were categorized into four categories: positive (0-0.99), fair (1-1.99), low (2-2.99), and negative (≥3)

Data analysis

Five policies were selected to pilot the study methodology: the oldest negative policy, the newest positive policy, and three additional policies that fall in between these two categorically and temporally. The five policies were: Alabama's birth certificate policies (AL Code § 22-9A-19 & AL Code § 22-9A-21), Hawaii's birth certificate policy (Haw. Rev. Stat. Ann. § 338-17.7), Kansas' memo from the department of revenue staff attorney addressing gender amendments on

driver licenses, Iowa's birth certificate policy (Iowa Code Ann. § 144.23(3)), and a Senate Bill introduced in Maryland which addresses amendment of driver's licenses (SB 196).

Atlas.ti was used to code documents and organize quotes. Pilot documents were read at least three times, line by line, to get a sense of the content and language being used. After reading the pilot policies documents, I generated a list of search terms to code and explore the remainder of the dataset. I searched and coded documents for the following words and their synonyms: accuracy, biology, detransition, doctor, gender, genetic, genitalia, innate or immutable, intersex, medical procedure, objective, reproduction, sex, transgender, and transition. Documents were grouped by policy environment categorization, type of document (bill, policy, case, memo, or other), and whether a policy discusses birth certificate or driver's license amendments.

A series of structured questions that trace discursive practices was developed and applied to the codes based on the content of the policies and the research question (Table 1). Structured questions act to identify patterns and themes throughout the dataset. They may be philosophical, developed from past literature, or specific to the data.[27] The structured questions I developed were purposefully defined to center the policy in the discourses I have previously defined and to look for evidence of intertextuality (transfer of knowledge between texts). My priorities in this analysis were to look for themes within the data and to look at how language is used (or not used) to communicate those themes. Specifically, I look for language that describes the identities of trans people, defines gender/sex, shows evidence of power imbalances, and enacts the three master discourses in question. Two authors met regularly to discuss the policy findings in relation to the structured questions.

Table 1. Structured Questions
1. What type of policy (case, memo, codified policy, etc.)? 2. What is the problem, as it is framed by the state? 3. How are transgender and nonbinary people defined? 4. How is sex defined? 5. Is there evidence of eugenics either through the presence or absence of language?

Results

Policies by category and time

To better understand the scope of my entire dataset, the policies were organized by both category and time (Figures 2 and 3). Few states fell into the negative category, while the majority fell into low, positive, or fair. Policy publication/most recent amendment dates ranged from 1986 to 2022. The three oldest policies were found in Louisiana (negative), Texas (fair), and Kentucky (negative). The majority of policies introduced or amended since 2020 fell into the low category. However, positive and fair category policies were accumulated towards 2020. Negative category policies were spread out over the timeline. At least one state in every category included genetics, provider verification, surgical requirements, or no 'X' gender/sex option (Figure 3). The only states to bar legal gender affirmation completely were states in the low category.

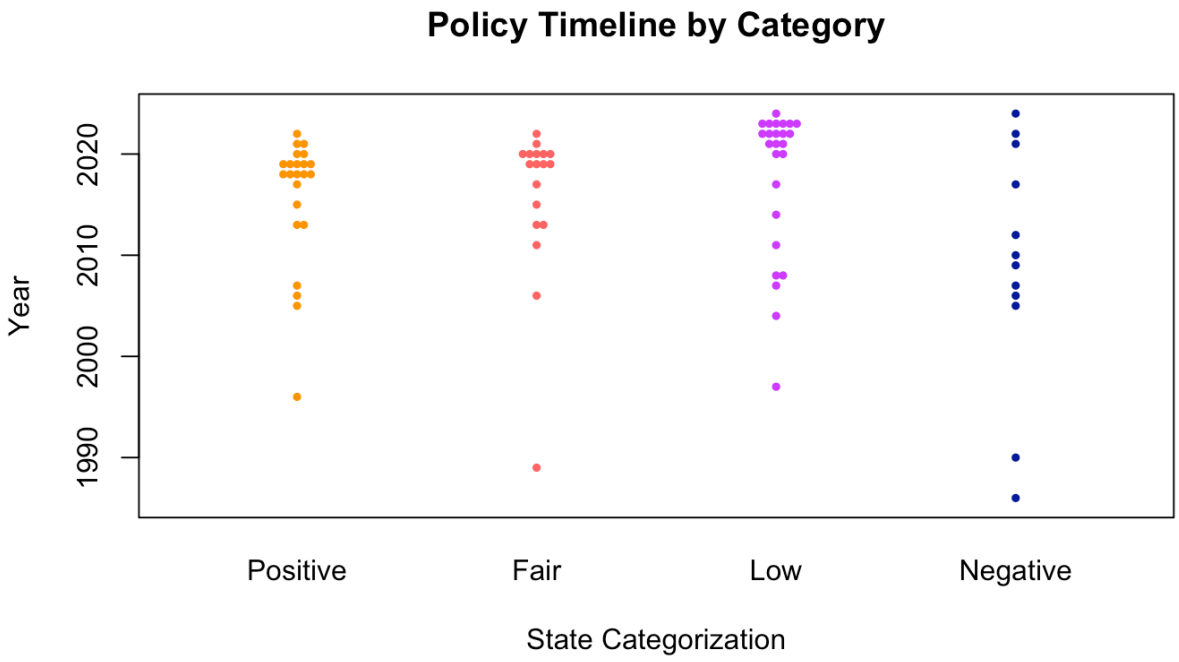

Figure 2. Policy timeline by category

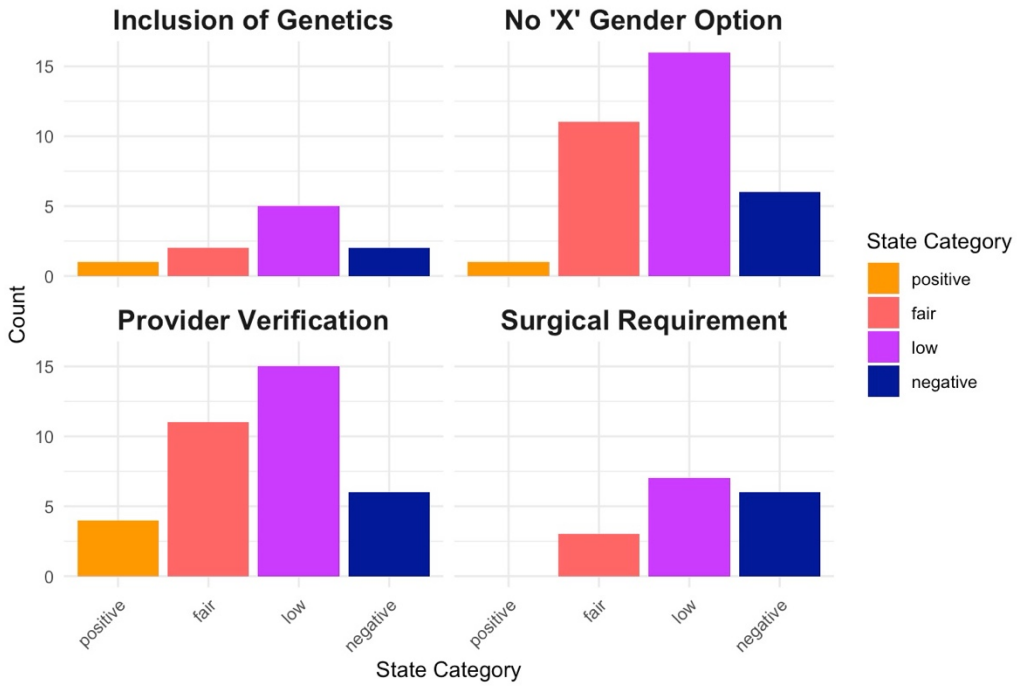

Figure 3. State distribution by category and scoring criteria

Transgender identity

Although the implicit implication is that trans people would be the only people interested in changing their sex marker on legal documentation, transgender people are rarely called out by name. Both states with lower and higher restrictive policy scores have explicitly mentioned transgender people in some capacity, although there are variations in their definitions. For example, Louisiana promotes a definition of transgender people that promotes anatomy and surgery as central to their identity:

> *"The court shall require such proof as it deems necessary to be convinced that the petitioner was properly diagnosed as a transsexual or pseudo-hermaphrodite, that sex reassignment or corrective surgery has been properly performed upon the petitioner, and that as a result of such surgery and subsequent medical treatment the anatomical structure of the sex of the petitioner has been changed to a sex other than that which is stated on the original birth certificate of the petitioner."* (La. Rev. Stat. Ann. § 40:62)

Alternatively, states such as California provide a more nuanced definition of transgender identity that also acknowledges interpersonal and structural violence:

> *"Transgender is an umbrella term used to describe people whose gender identity or gender expression do not match the gender they were assigned at birth. Some transgender people have medically transitioned, undergoing gender affirming surgeries and hormonal treatments, while other transgender people do not choose any form of medical transition. There is no uniform set of procedures that are sought by transgender people that pursue medical transition. Transgender people may identify as female, male, or nonbinary, may or may not have been born with intersex traits, may or may not use gender-neutral pronouns, and may or may not use more specific terms to describe their*

genders, such as agender, genderqueer, gender fluid, Two Spirit, bigender, pangender, gender nonconforming, or gender variant. Studies show that transgender people disproportionately face discrimination, harassment, and violence in areas of life including housing, education, employment, health care, and law enforcement." (California SB 179)

Transgender individuals were most frequently defined in relation to their medical and surgical history. In these cases, those who are allowed to change their legal sex marker are those whose "sex has been changed by surgical procedure", who have undergone a "sex change operation", or have received "clinically appropriate" medical treatment. Often, these treatments are expected to be "permanent" and individuals are expected to be "irrevocably committed" to their medical transition. Less frequently, transgender individuals are defined by their mental state, such as by Conneticut's birth certificate policy, which states that an individual must have a letter from a psychologist who attests that the "*registrant is socially, psychologically, and mentally the designated sex*" (Connecticut State Agencies §§ 19a-41-5 through 19a- 41-12 (DOH)) or Indiana's case regarding change of sex designation, in which the diagnosis of gender dysphoria is used as an argument to allow for change of sex marker on legal identification documents. Another example is provided by Utah, which (in part) defines a transgender individual as someone who *"suffers from clinically significant distress or impairment due to the current sex designation on the birth certificate"* (Utah SB 0093).

Sometimes, trans people were defined relatively neutrally by policy, as individuals whose sex or gender differs from those listed on their identification documents or people who want their gender to be reflected in their identification documents. This definition is called on in positive states such that trans individuals are able to self-describe their gender. For example, Nevada's

drivers license policy defines a trans person as, "*A person who wishes to change the gender indicated on his or her driver's license*" who can, "*attest to such a change by submitting his or her declaration as a person of the identified gender on a form provided by the Department*" (Nevada NAC 483.070). In negative and low states, this definition is called on to invalidate trans peoples' identities. Such is the case for Florida's 2024 DMV Memo. Although it inexplicitly defines trans people as those who "wished to alter the gender marker on his or her license," it later states that this a punishable misrepresentation:

> "*...misrepresenting one's gender, understood as sex, on a driver license constitutes fraud under s. 322,212, F.S., and subjects an offender to criminal and civil penalties, including cancellation, suspension, or revocation of his or her driver license*" (Florida FLHSMV Memo)

In a smaller proportion of states transgender people, sex, and gender are not defined at all and the policies speak broadly to any change that may appear on a birth certificate or driver's license, such as a change in paternity.

Biological Essentialism

Sex is defined unclearly and inconsistently among and within the states. Biology and sex were referenced more frequently in states with negative and low policy environments. It is often used interchangeably with the term gender, and states do not agree on whether the markers in question represent sex or gender. While some states explicitly state that sex and gender are well understood to capture the same qualities as a reason for not allowing gender marker changes, others say it is not the job of the state to elicit this distinction such that only sex assigned at birth can be captured on identification documents.

> "*The parties and their experts dispute whether sex and gender identity are the same thing or distinct categories. The Court need not decide this issue, however, because even assuming solely for the sake of argument that Defendants' position is right and the sex marker on a birth certificate identifies only biological sex at the time of birth, distinct from gender identity, and thus is "accurately recorded at birth" under the statute, Ohio allows changes to other birth certificate information that was "accurately recorded at birth.*" (Ohio Ray v. McCloud)

There are also instances in which the clarification between sex and gender is made in order to bar gender/sex marker changes for trans people, stating that only sex should be represented on identification documents. In these instances, sex is referred to as immutable and clearly determined at conception and/or birth. Therefore, an individual cannot change a marker on an identification document that is meant to represent sex, as sex is stated to be a static characteristic that can not be changed. Gender, on the other hand, represents someone's identity or subjective experience, which may or may not reflect their sex assigned at birth.

In Hawaii, they use the conflation of sex and gender to promote legal gender marker changes for transgender people, stating that, "*sex markers on identification documents enable sex-identity and gender-identity discrimination and are not rationally related to a legitimate policy goal*" (Hawaii HB1165). They also argue that binary categorization does not capture the wide array of gender and sex expressions. Conversely, Florida uses the conflation of sex and gender to prohibit gender marker changes on driver's licenses. In this instance, an individual

cannot self-identify their gender; rather, their gender is determined by the same immutable characteristics that make up an individual's sex assigned at birth:

> *"Furthermore, the term "gender" in s. 322.08, F.S., does not refer to a person's internal sense of his or her gender role or identification, but has historically and commonly been understood as a synonym for "sex," which is determined by innate and immutable biological and genetic characteristics."* (Florida FLHSMV Memo)

Along with Florida, nine other states mention genetics, chromosomes, or DNA in their policies. The majority of policies that use genetics as a validated measure of sex were introduced or modified in the past four years (n = 7). Several of these policies use genetics in their definition of sex to prohibit changes to gender markers for transgender individuals. In Louisiana, gender markers on birth certificates may only be changed if an individual or legal guardian:

> "*... presents competent medical evidence in the form of affidavits from two or more physicians certifying and establishing by medical diagnosis that the original erroneous sex designation was due to a hereditary genetic defect or hormone deficiency, including but not limited to congenital adrenal hyperplasia or a related condition, and not due to sexual reassignment or major corrective surgery as contemplated in R.S. 40:62.*"
>
> (Louisiana La. Rev. Stat. Ann. § 40:62)

In contrast, positive states use genetics exclusively to define individuals who are intersex. Other states use genetics, anatomy, hormonal milieu, and reproductive capability to prove the scientific objectivity of sex in contrast to gender, which is a "subjective experience" (Montana DPHHS

Officials State 2022 Administrative Rule Memo). In these instances, the problem framed by the state is to maintain the accuracy of vital records.

Most commonly, sex is defined anatomically. This is seen in the majority of policies, which state an individual may change their legal gender marker following a "sex change" or surgical procedure.

> *"The court shall require such proof as it deems necessary to be convinced that the petitioner was properly diagnosed as a transsexual or pseudo-hermaphrodite, that sex reassignment or corrective surgery has been properly performed upon the petitioner, and that as a result of such surgery and subsequent medical treatment the anatomical structure of the sex of the petitioner has been changed to a sex other than that which is stated on the original birth certificate of the petitioner."* (Louisiana La. Rev. Stat. Ann. § 40:62)

Inconsistent standards for how sex is defined and the confusion this raises in enforcing policy is best summarized in a Michigan court opinion. Here, it is argued that due to the complexity of defining and measuring sex, limiting someone's ability to change their sex on identity documents does not serve the purpose of maintaining the accuracy of vital records:

> *To the extent the objective is to maintain accuracy of vital records in regard to biological sex, "[s]ex determinations made at birth are most often based on the observation of external genitalia alone." [...] But "[t]here is scientific consensus that biological sex is determined by numerous elements, which can include chromosomal composition, internal reproductive organs, external genitalia, hormone prevalence, and brain structure." [...] In other words, while it is generally accepted that multiple factors go into determining biological sex, there is no generally accepted test or definition by which to make that*

determination. And, significantly, section 2831(c) itself is silent on the nature and extent of the required "sex-reassignment surgery." Does it mean only external genital surgery is necessary? Is breast or chest surgery also required? What about aesthetic procedures? Or is it whatever surgical options the physician deems appropriate for the individual? Bottom line, section 2831(c) mandates an undefined surgery to satisfy an undefined biological standard. Therefore, requiring an individual to undergo a "sex-reassignment surgery" is not substantially related to any state interest in maintaining the accuracy of vital records as they pertain to biological sex. (Michigan Opinion No. 7313)

Eugenics

Many states have surgery requirements that they define broadly as "appropriate clinical treatment" individuals must undergo and provide proof of to ensure that either their "sex" or "gender" has been changed. Some state that an individual must undergo a "sex change procedure" or "sex reassignment surgery", while some of these explicitly name that an individual must undergo genital surgery in order to change their legal gender marker. For example, Louisiana's birth certificate policy states:

"Any person born in Louisiana who has sustained sex reassignment or corrective surgery which has changed the anatomical structure of the sex of the individual to that of a sex other than that which appears on the original birth certificate of the individual, may petition a court of competent jurisdiction as provided in this Section to obtain a new certificate of birth." La.Rev. Stat. Ann. § 40:62

Only two states explicitly addressed the larger implication that the policies could ultimately result in sterilization for transgender individuals. Both of these were reflected in court opinions which ruled against restrictive gender/sex marker change policies. The first of these was Michigan, in which the court opinion ruled that gender marker policies that require sex reassignment surgeries were a violation of an individual's rights to equal protection, due process, and privacy. This opinion explicitly mentions that the requirement for an individual to undergo surgeries can potentially result in sterilization:

> *"It is not clear why Michigan's law for changing the sex designation on birth certificates, when used for identification purposes, would require a transgender person to undergo invasive, often irreversible, and expensive surgery. Not only does it impose a unique burden on a transgender person, depending on the nature of the surgery required by section 2831(c), it may well result in that person's sterilization. No state interest supports such an unnecessary burden, as the laws of many other states confirm." (Michigan Opinion No. 7313)*

Similarly, Alabama's court ruling points to the extremity of the consequences of this requirement:

> *"The injuries caused by Policy Order 63 are severe. For individuals born in Alabama or previously licensed here whose gender identity differs from the sex they were assigned at birth, the policy requires surgery, which results in permanent infertility in "almost all cases," to be able to obtain a license with a sex designation that matches their gender." (Alabama Corbitt v. Taylor)*

Medicalization

Medicalization as a master discourse was present in most of the documents. Thirty-five states and Washington, D.C. indicate in either or both their birth certificate and driver's license policies that an individual must receive verification from some type of clinician to receive legal recognition of their gender identity on state-issued identification documents. One state (Colorado) has the same requirement, but only for trans youth. Possible clinicians are indicated in Table 2, and could include a physician; physician's assistant; licensed physician and surgeon; osteopathic physician and surgeon; and a licensed medical, osteopathic physician. Specific medical procedures requested are also provided in Table 1 and include: "surgery or other treatment" that results in "the sex designation of the person [being] changed"; "sex change"; "sex has been changed by surgical procedure"; "appropriate clinical treatment for gender transition to the new gender and has completed the transition to the new gender"; "appropriate clinical treatment for change of sex"; "physician has re-evaluated the applicant and determined that gender reclassification based on physical criteria is appropriate"; "emphatic declaration or finding of gender reclassification". Importantly, the words "sex" and "change" frequently appear. The use of sex in these contexts equates gender identity with an individual's biological sex (in whatever biological context is being referred to – here, likely anatomy or secondary sex characteristics). Physicians must provide confirmation of medical procedures in the form of medical certifications, notarized statements, and affidavits.

Table 2. Clinicians and medical procedures listed in the dataset

Clinicians who can provide verification	**Medical procedures**
Advanced nurse practitioner Advanced practice nurse Advanced practice registered nurse	Altering sex characteristics to the opposite sex Any treatment Appropriate clinical treatment Change of gender

Case worker Counselor Licensed health care professional Licensed mental health professional Licensed physician Licensed provider Licensed social worker Licensed therapist Nurse practitioner Osteopathic physician Physician Physician assistant Physician in medicine or osteopathy Physician licensed to practice medicine Physician's assistant Professional counselor Psychiatrist Psychologist Social worker Surgeon	Clinically appropriate treatment Gender affirming surgeries and hormonal treatment Gender reclassification based on physical criteria Gender transition Medical transition Sex change Sex change operation Surgery or other treatment Surgical gender change procedure Surgical, hormonal, psychological, or other treatment appropriate for the individual Surgical procedure

Medicalization was present in all state categorizations, including positive. For example, Hawaii requires an individual to provide proof that the individual has "appropriate clinical treatment for gender transition to the new gender and completed the transition" in the form of an affidavit from a "licensed physician or physician assistant" (Haw. Rev. Stat. Ann. § 338-17.7). In this case, the physician is given the authority to declare whether a clinical treatment for gender transition is both "appropriate" and "complete" by the state. The use of the word appropriate appears several times throughout different states' policies, but is never defined by the state; the definition of what qualifies as appropriate medical care, in most cases, is left to the physician responsible for state verification. However, some states, such as California, Delaware, Illinois, and Washington D.C. have indicated that clinical treatment for gender transition should be based on "contemporary medical standards" (California SB179, Delaware Administrative Code Title 16 § 4205, D.C. Law 20-37, Illinois HB1785).

Some states (such as Alabama, Iowa, and Kansas) describe the circumstances under which they will not grant legal gender recognition. Taken altogether, instances where a state may deny gender/sex amendment include: "when the applicant does not submit the minimum documentation required", "if the State Registrar has reasonable cause to question the validity or adequacy of the sworn statements or the documentary evidence of the applicant", if the state registrar needs to "make a further investigation or require further information necessary to determine whether a sex change has occurred", or if the applicant simply provides medical records without an "emphatic declaration or finding of gender classification by the applicant's attending physician". In this sense, even if the individual applying for a gender amendment in legal documentation behaves in the way that the state deems necessary, their identity may still be called into question through further investigation.

Autonomy (or lack thereof)

As made clear through the medicalization of trans individuals present in several of these policies, physicians and the state are both designated as the ultimate authority in defining someone's gender/sex identity over the trans people themselves. This is evident in the language, such as that in Iowa, which declares:

> *"The state registrar may make a further investigation or require further information necessary to determine whether a sex change has occurred." (Iowa I.C.A. § 144.23)*

Trans people, in this sense, cannot be relied on for self-validation of their identity and are therefore stripped of the autonomy to do so. Medical providers and states are the only sources capable of making objective conclusions about the information included on birth certificates and identification cards, as noted in the use of language reasoning, these laws are in place to ensure

the "integrity and accuracy of vital records." In the process of legal gender recognition, they are also stripped of their bodily autonomy in making decisions about which medical procedures they will and will not pursue. The recognition of identity through state-level legal documentation is a negotiation between individuals, the state, and medical providers, who must make "emphatic" declarations over the terms for that recognition.

Possibilities for alternative discourses are offered by policies that use inclusive language and do not rely on the medicalization of trans individuals. This is particularly reflected in Maryland's driver's license policies, which allow the individual to self-identify their gender without medical proof, select an 'X' gender option if they wish to do so,

Discussion

This study aimed to describe the implications of legal gender/sex marker policies for trans people in the US. Through my analysis, I demonstrated how three master discourses (eugenics, biological essentialism, and medicalization) were present throughout these policies. Central to DA is the discussion of how language and master discourses present in the text shape our social realities. As such, it is important to ask what these policies mean for the production of knowledge, meaning, and power. Language mediates and constructs our understanding of reality, and it is through shared language that meaning is created. In the policies I analyzed, definitions of gender/sex and transgender people were inconsistent and often intended to create power structures in which the state and medical systems had power over trans constituents. Most states, despite policy rating, require medical procedures (ranging from "sex change" to "clinically appropriate treatment) and provider verification for legal gender recognition, while only two explicitly acknowledged the burden this places on trans individuals and the possible

consequences these practices have on future fertility. Ultimately, through enacting these master discourses, the policies communicate to trans people that they do not have the authority to self-identify, and gender/sex can only be "objectively" determined by the state through biology and licensed medical practitioners.

Sex is defined in these policies as an objective and immutable characteristic, and most commonly is defined based on sexual anatomy/genitalia. Importantly, sex is (for both cisgender and transgender individuals) a characteristic that can change over time, especially depending on which definition is enacted. For example, if we are defining sex based on hormonal milieu, it has been observed that both cisgender men and women will experience natural fluctuations in testosterone and estrogen, respectively, over their life course.[28,29] If we are defining sex based on secondary sex characteristics, many cisgender women may undergo surgical procedures (mastectomies, hysterectomies, etc.), based on existing health concerns, recommendations from their providers, or reproductive health goals. The idea that sex is static and immutable is challenged by the concept of sex contextualism–the view that sex is often defined dependent on the context and motivation. In this way, as Sarah Richardson describes, "the biological construct of 'sex' is a site of power and politics."[30] Both pro- and anti-trans advocates have enacted definitions of sex that are relevant to achieving their political goals. While trans advocates have argued that transgender identity should be included in policies that prevent discrimination on the basis of sex, anti-trans politicians have responded by rewriting definitions of sex to explicitly carve out transgender people from anti-discrimination policies altogether.[14] This demonstrates that relying on biological definitions for trans identity might be successful in the short term, but does not have staying power.

The policies in this dataset perpetuate the medicalization of trans people by requiring provider verification in order to access legal gender affirmation. In this case, the physician is given the freedom to declare whether a clinical treatment for gender transition is both "appropriate" and "complete" by the state. While these terms are said as a matter of fact, that makes it seem as though there is an objective measure of appropriateness and completeness, the physician (in reality) makes this decision subjectively. The use of the word appropriate appears several times throughout different states' policies, but is never defined by the state–the definition is left to the physician responsible for state verification. Additionally, the fact that a majority of states require provider verification is concerning not only for trans people but for their medical providers, as placing doctors at the center of these policies introduces another way that doctors caring for transgender patients can be criminalized in the future.

The definitions of transgender people provided by the state do nothing to capture the nuance and multiplicity of trans individuals' lived experiences. They largely equate being trans to the desire to pursue medical procedures that alter secondary sex characteristics. In reality, many trans people will never pursue gender-affirming medical treatments/surgeries, whether they don't want to or don't have the resources to access these services, and their trans identities are just as valid. Importantly, defining trans people in this way leaves behind the people who cannot access gender-affirming medical services due to political, financial, or social barriers. Therefore, the individuals who can pursue legal gender recognition are likely those who are more privileged and have access to resources such as insurance, money, time they can take off of work, safe medical care, etc. Moreover, defining transgender individuals based on their psychological well-being or their relationship to gender dysphoria reflects an outdated notion that trans people must suffer before being allowed access to services and legal recognition. All

trans people deserve to have legal recognition of their identity, regardless of meeting state-defined criteria, and states should adjust their policies to be in line with this value.

Legal gender affirmation has been linked to improved access to health care, better mental health outcomes, and the development of protective coping strategies.[15–17,31,32] In contrast, wanting but being unable to update legal documents has been associated with negative mental health outcomes (including increased suicidality) as well as workplace discrimination and barriers to medical care.[33–35] Ensuring that trans people have accessible pathways to legal gender affirmation is therefore essential to advancing health equity. However, the current political climate is increasingly restricting these rights. At the time of data collection (early 2024), five states barred legal gender affirmation altogether. By March 2025, that number had risen to eight.[14] This shift reflects a growing wave of political violence targeting trans communities. Alongside other anti-trans legislation, these restrictions are likely to exacerbate existing health disparities among trans populations.

Some trans individuals, along with public health organizations and advocacy groups, have called for the removal of gender markers from identification documents altogether.[10] In 2019, for example, the American Medical Association recommended eliminating public gender markers from birth certificates, citing the fact that binary gender markers fail to accurately reflect the biological diversity of sex expression.[36] Others advocate for trans people's right to self-identify their gender on official documents without requiring verification from a medical provider. While such changes may seem distant in the current U.S. policy landscape, advocates in other countries have successfully advanced these reforms. In Argentina, the landmark Gender Identity Law, passed in 2012, aimed to "depathologize, decriminalize, destigmatize, and deauthorize judicial authority" over gender identity.[12] Previously, Argentina required sterilizing

surgeries for trans individuals to access legal gender affirmation; under the new law, legal recognition is now based solely on self-identification.

Addressing discrimination against trans individuals, especially that enacted in policy rooted in eugenics, medicalization, and biological essentialism, is critical to improving the health and well-being of transgender people. Policies that limit the reproductive capacities of trans individuals or make trans individuals choose between their ability to create a family and to validate their gender identity legally are a violation of human rights. Trans people should not have to choose between their identity and equitable access to reproductive healthcare, but they are often faced with this decision. Although explicit sterilization laws in the US were revoked in the 1970s, I have shown that present-day policies have the same effect on trans people through the use of passive eugenics (both positive and negative strategies that do not explicitly aim to limit or promote the reproduction of certain groups of people but have the same effect in practice).

The most significant limitation of this study is the rapidly evolving political landscape. Although I updated my policy scan at the end of the data analysis phase, the current pace at which anti-trans legislation is being introduced and enacted presents ongoing challenges to maintaining a comprehensive and up-to-date dataset. Capturing these changes in real time would be a demanding but necessary undertaking for future research. Another limitation lies in the exclusive reliance on policy documents, which, while valuable for understanding structural conditions, do not capture the lived experiences of trans individuals navigating legal gender affirmation processes. This limits our ability to assess how policies are implemented on the ground and experienced across diverse social, racial, and economic contexts. Additionally, this study does not account for enforcement practices or administrative discretion, both of which can

significantly shape access to legal gender affirmation regardless of the written policy. The dataset also does not reflect the potential impact of local-level (e.g., city or county) policies that may either reinforce or mitigate state-level restrictions. Future research should explore the real-world effects of these policies on trans individuals, including qualitative studies that center lived experience. Comparative studies between jurisdictions with and without provider verification requirements could also offer valuable insights into how medicalization impacts trans people's access to care, autonomy, and overall well-being. Furthermore, longitudinal research could help assess the long-term mental health and social impacts of shifting legal environments on trans communities.

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Chapter 3

Structural Equation Modeling Identifies Healthcare Avoidance as a Mediator Between Policy and Parental Desire Among Transgender Adults in Washington State

Introduction

An estimated 19% of trans adults in the U.S. are parents.[1] Despite reports that transgender and nonbinary (trans) people are interested in having children,[2] they face significant political, structural, and interpersonal barriers when accessing reproductive health services, fertility preservation, and healthcare more broadly. Globally, some countries have policies that require sterilization as a step to legal gender affirmation; while it is not an explicit requirement in the U.S.,[3] many states require proof of "clinically appropriate treatment" as a prerequisite to updating gender markers on identification documents.[4] Additionally, the U.S. is currently facing an onslaught of anti-trans policies—with 857 anti-trans bills being introduced in 2025 so far, the most in history—as well as policies that otherwise restrict bodily autonomy, such as abortion bans. These policies restrict individuals' access to public spaces, legal affirmation, and gender-affirming healthcare (GAHC), among other limitations. The increase in anti-trans legislation has been associated with negative physical and mental health outcomes for trans individuals, while protective policies have been associated with reduced depression and anxiety and fewer experiences of discrimination.[5–8]

Trans people experience discrimination on multiple levels, including harassment and violence in their broader communities,[9,10] which influence their decisions about whether to have children.[2] For example, one study of pregnant trans men found that participants faced difficult decisions about how to present themselves publicly (e.g., as a pregnant "cisgender woman," as a trans man who is not pregnant, or as a visibly pregnant trans man), often based on concerns for their safety.[11] Other studies have shown that trans individuals fear their children will be targets of discrimination because of their parent's gender identity.[2]

These experiences are shaped by normative assumptions about who is "allowed" to become a parent and, in turn, inform broader societal beliefs about who is considered fit to raise

children. Due to gendered notions surrounding pregnancy and parenting, identities such as the pregnant trans man, the nonbinary parent, and the trans mother are often incomprehensible to the general public. As a result, trans people are frequently questioned, disempowered, or denied recognition of their existence and roles as parents in parental policies because they do not conform to societal expectations. The concept of "parental fitness"—one's perceived ability to parent, often rooted in transphobic and racist ideals—further influences public perceptions of trans individuals' right to parent.[2,12] In extreme cases, trans people are reported to child protective services solely on the basis of their gender identity, sometimes even before their child is born.[11]

These normative assumptions give rise to institutional barriers that systematically undermine trans people's access to reproductive health services and fertility preservation. Trans individuals frequently encounter barriers to accessing medical care, including high costs, a lack of provider training and cultural competency, and, in some cases, outright refusal of care.[9,10] These experiences can be exacerbated in family planning and reproductive health settings.[2,13] Although the World Professional Association for Transgender Health recommends that providers discuss fertility preservation with patients prior to initiating gender-affirming hormone care GAHC,[14] up to 50% of trans adults report never receiving this counseling.[2] Many providers lack adequate knowledge about the effects of hormone therapy on fertility and are therefore ill-equipped to help trans patients make informed decisions about their reproductive options.[2,11] Additionally, clinical experiences in which trans patients are misgendered, deadnamed, or subjected to assumptions about their anatomy or relationships to their bodies can be profoundly harmful. Over time, these experiences lead to healthcare avoidance and delay (HAD), with nearly one in four trans adults reporting that they have avoided care due to anticipated stigma.[9]

Cost is also a significant factor, and a large proportion of trans adults report avoiding necessary medical care due to financial barriers.[9,15] This is likely exaggerated for fertility preservation procedures, which often involve high out-of-pocket costs.[13]

Lastly, many studies cite the importance of social support for trans people on the path to parenthood, as it can often be an isolating experience.[11] While peer and familial support can be a source of resilience, trans people undergoing pregnancy have reported feeling excluded from both parenting support groups as well as their queer communities.[11,16] Largely, there is a lack of adequate resource for support for trans parents, even in organizations and communities specific to gay, lesbian, and bisexual parents.[11]

Despite these barriers, many trans adults wish to have biological children. It is therefore of the utmost importance that trans individuals are supported on their paths to parenthood. While studies have looked at associations between sociodemographic factors and parent desire or reproductive healthcare access, to the awareness of the authors, no studies have looked at interactions between multi-level barriers that impact trans peoples' parental desire. As such, the objective of this work is to investigate the relationship among trans policy environment, anti-trans environment, access to care, and social support to understand how they collectively influence desire for parenthood among trans adults in Washington state. Using structural equation modeling (SEM), I will test two hypothesized models (Figures 1 and 2) that propose parental desire is influenced by interpersonal, institutional, community, and policy level factors. I will also assess the direct, indirect, and total effects of the associations via a mediational analysis between the proposed latent and observed variables. I hypothesize that (1) national anti-trans policy awareness is negatively associated with parental desire (Figure 1) and (2) state-level protective policy awareness is positively associated with parental desire (Figure 2).

Theoretical models

The hypothesized models are informed by the socioecological model and the ecosocial theory of disease distribution. The socioecological model is a framework used to organize influences on health behavior into multiple levels: policy, community, institutional, interpersonal and individual.[17–20] There are interactions between these levels such that health outcomes and behaviors are not single faceted but influenced by and have influence over the larger political and social environments in which they occur. This has been a helpful framework in public health research for pointing towards "upstream" determinants of health and for directing interventions beyond the individual to larger communities and policies.

Ecosocial theory of disease distribution connects the "body natural" (individual, genetic, social, and political level factors that influence behaviors and health) to the "body politic" (priorities, policies, and practices of the larger political and economic systems in which individuals live) through "embodied truths" (social and ecological context biologically incorporated into lived experiences that provide evidence regarding one's health).[21,22] It is often used to explain how systemic injustices are embodied and disproportionately applied to marginalized groups to result in health inequities. Theory shapes and explains embodied truths through drawing connections through multilevel factors that influence health outcomes over an individual's life course. As such, it takes a critical lens to examine not only an individual's present circumstances but also how a history of structural and ecological factors have influenced health outcomes as they exist today. It also applies agency and accountability as each level–

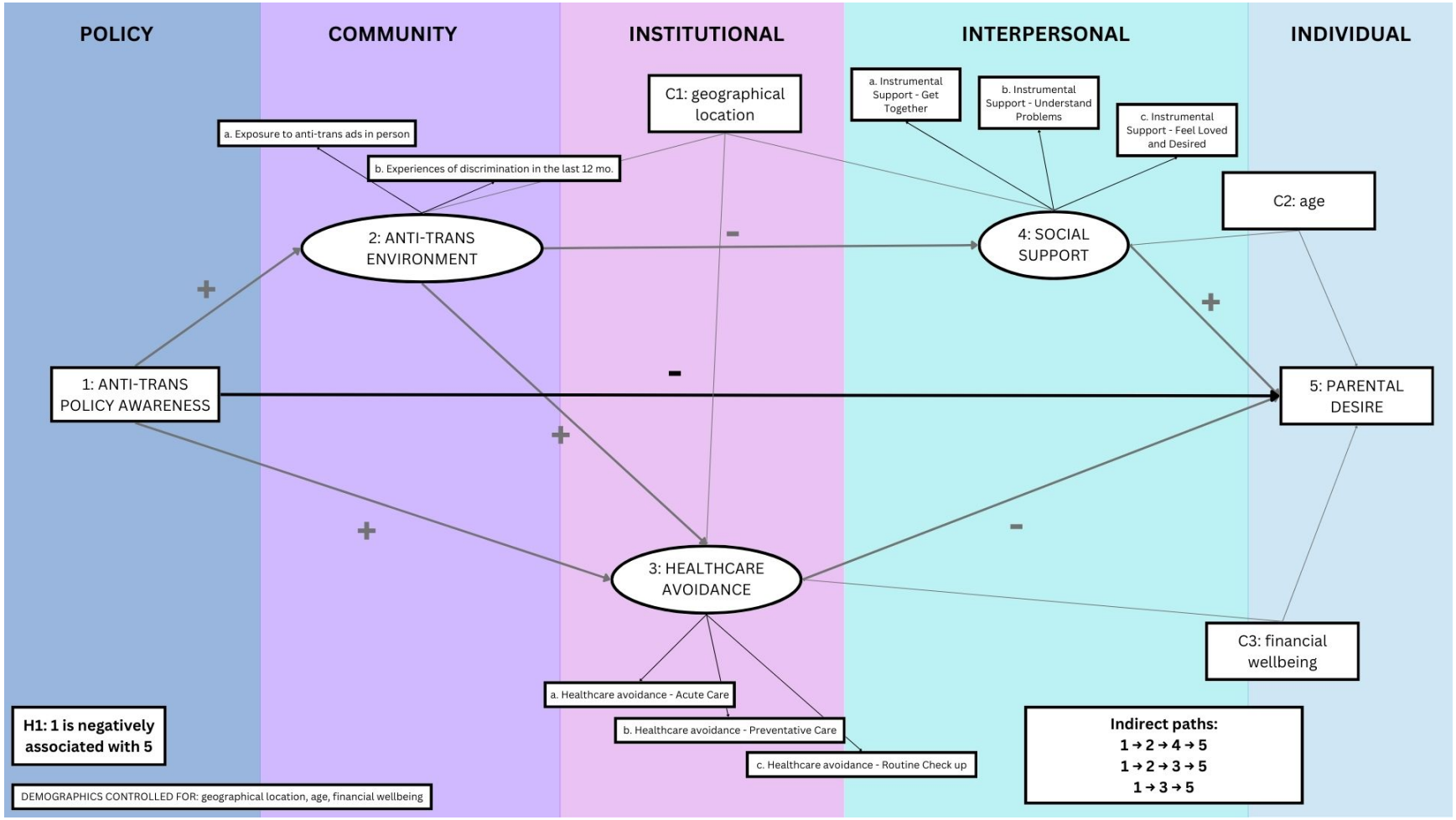

Figure 1. Hypothesized model denoting relationship between anti-trans policy awareness and parental desire. Model is adjusted for geographical location, age, and financial wellbeing.

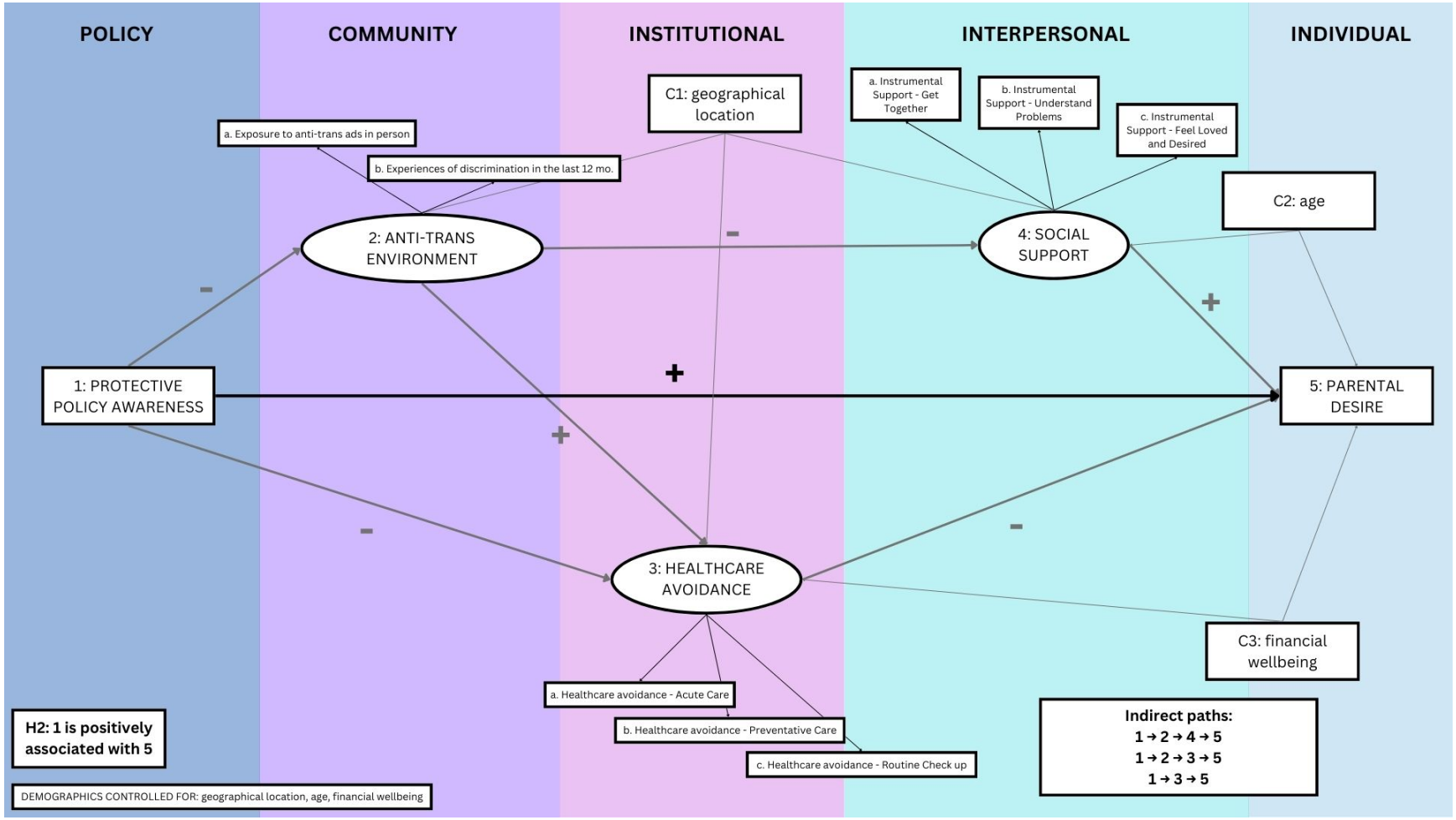

Figure 2. Hypothesized model denoting relationship between state-level protective policy awareness and parental desire. Model is adjusted for geographical location, age, and financial wellbeing.

calling out who has power and who does not as well as the responsibilities of policies and institutions to communities and individuals which they are supposed to protect but often, in practice, do not. It also calls for accountability to the larger systems that influence individual level behaviors and health outcomes, removing blame from the individual. This theory is well suited for this work because this research question is situated within trans individual's embodied truth and influenced by a history of harmful social and political practices.

While the socioecological model presents systems as nested within each other, ecosocial theory challenges this hierarchy, saying the interactions between levels depend on social and biological systems.[22] This reflects more accurately the relationship between variables in my hypothesized models, given that each level does not necessarily supersede the next. Social norms are not random; rather, they reflect the political and social contexts in which they are situated. Still, the socioecological model was included as an organizational framework for the observed and latent variables.

Methods

The PATH Study

I used the STrengthening the Reporting of OBservational studies in Epidemiology reporting guidelines for reporting cross-sectional studies.[23] Data came from the Priority Assessment in Trans Health (PATH) Study, a community-based cross-sectional survey developed for, by, and with trans Washingtonians. The survey was built in collaboration with the Trans Scientist and Stakeholder Advisory Board (TSSAB), which comprises of trans community members who either work in or have experience in navigating academia, public health, biomedical research, or clinical care. TSSAB members reviewed and edited the survey,

recruitment materials, and recruitment strategy for clarity, relevance, and appropriateness. They were also invited to add survey measures as they see fit.

Eligible individuals were those who lived in Washington State at the time of data collection, were over the age of 18, identified as transgender and/or nonbinary, could complete the survey in English, and were willing to provide electronic consent. Recruitment took place through local community organizations, attendance at community events, distribution of flyers at bars/coffee shops, and social media (n = 797) from March through April of 2023. Participants who were interested in the survey were first screened for eligibility and several cautions were taken to review responses for bots or invalid response: (1) Participants responded to a captcha, (2) IP address restrictions were placed on the survey such that IP addresses outside of the US were excluded and so the same IP address could not complete the survey more than once, and (3) responses were scored using a Q_RecaptchaScore, which rates responses based on their probability of being a bot. It took participants roughly 20-30 minutes to complete the survey. Every participant provided electronic written informed consent. Individuals who completed more than 80% of the survey were sent a $50 online gift card via email.

Notably, this survey took place in a trans-friendly state before the 2024 election and does not reflect the current political climate. Even so, the steep increase of anti-trans policies that started following the 2016 election and continued at the state level under a democratic presidency contributed to an increasingly hostile political environment nationally for trans populations. While this dataset does not capture the full extent of negative political impact experienced by trans individuals over the last 10 years, it does provide an example of the theoretical model under ideal conditions, in a state where trans people largely have access to care and political protections.

Measures

Variables to include in the theoretical model and analysis were selected by reading through the survey and selecting questions that are relevant to each socioecological level with respect to the research question. Once relevant variables were selected, I conducted an exploratory factor analysis (EFA)[24] for each level to determine which variables were most relevant to the latent factors I wanted to explore (threshold ≥ 0.40).[25] After conducting the original factor analysis, each level had 2-5 latent variables that were indicated (Figures 3 through 6). To simplify the theoretical model, I selected one latent factor for each socioecological level based on relevance to the research question.

Demographics

The survey asked participants' demographic characteristics, including age (dichotomized at median of 29 years old) gender (transgender woman/transgender man/nonbinary), sex assigned at birth (male/female/intersex), employment (employed/self-employed/out of work/student/unable to get work), geographical location (rural area/small city or town/large city, suburb near large city), housing in past 12 months (binary yes/no), education (dichotomized at median of high school/GED), income (dichotomized at median of $50,000), financial stability (dichotomized where Not at all, Very little, Somewhat is 'No' and Very well, Completely is 'Yes'), health insurance (binary yes/no), race/ethnicity (binary White non-Hispanic/People of Color), and whether they are currently a parent (binary yes/no).

Policy

Two observed variables were selected, one for each theoretical model, indicating policy awareness. The first question asked, '*How aware are you about anti-transgender bills in the United States?*' and participants could respond on a 5-point Likert scale from Not at all aware to

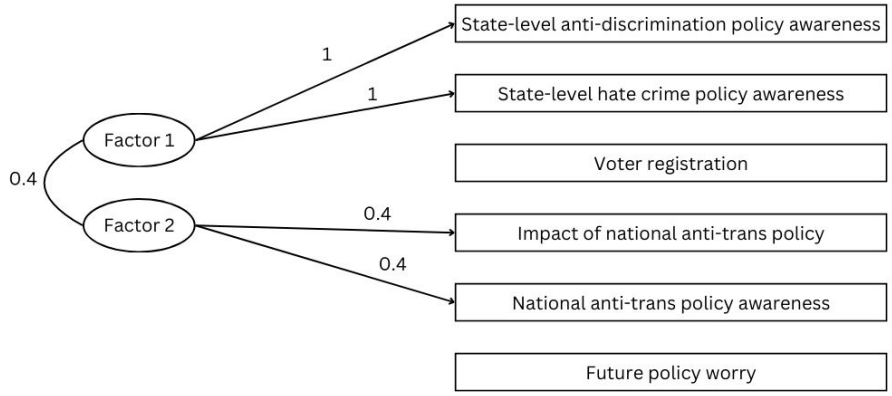

Figure 3. Exploratory Factor Analysis for Policy-level Variables.

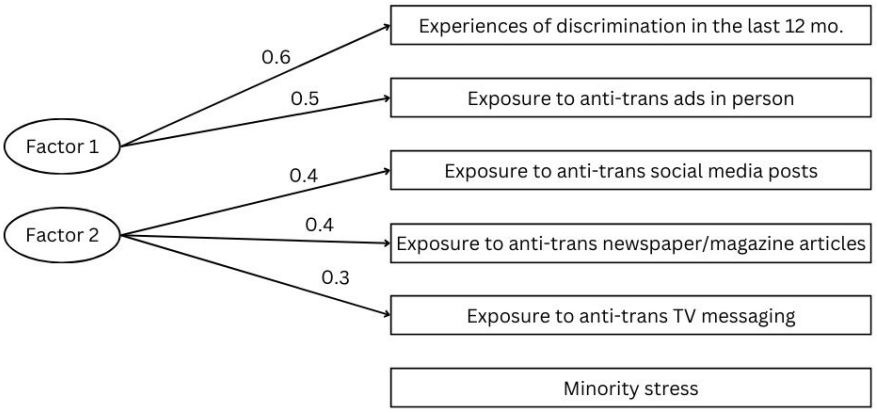

Figure 4. Exploratory Factor Analysis for Community-level Variables.

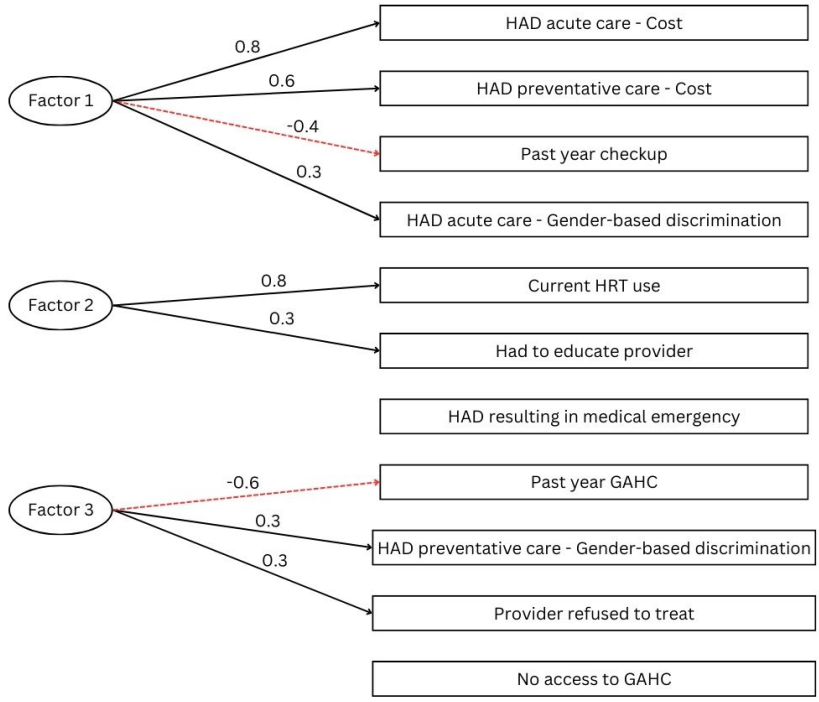

Figure 5. Exploratory Factor Analysis for Institutional-level Variables. GAHC = Gender-affirming Health Care.

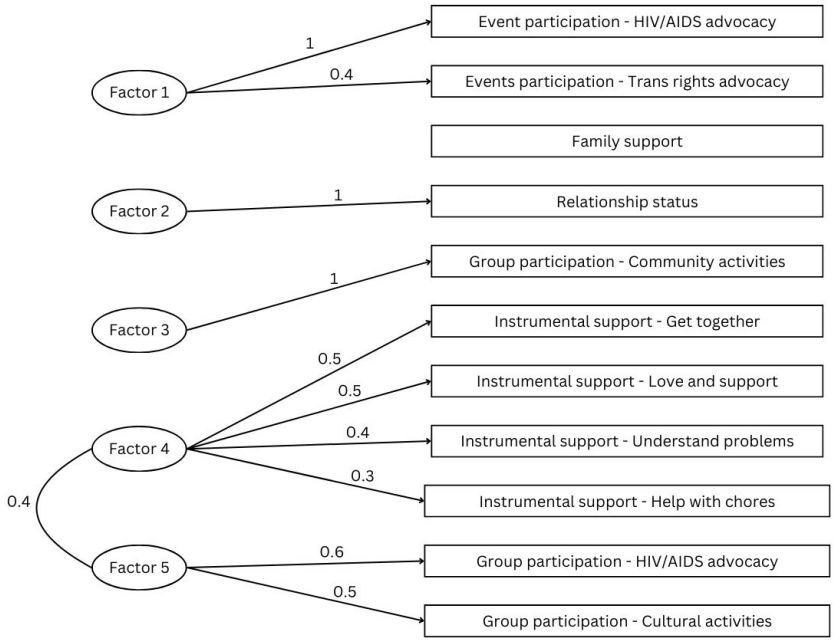

Figure 6. Exploratory Factor Analysis for Interpersonal-level Variables.

Extremely aware. Responses were dichotomized into low awareness (Not at all aware/slightly aware) and high awareness (Moderately aware/Very aware/Extremely aware). For awareness of state-level anti-discrimination policies, participants were asked whether they knew about discrimination policies in employment; housing; public education/schools; hospitals, doctors' offices, and healthcare centers; supermarkets/retail stores; and credit/lending. Responses were dichotomized into participants who knew of at least one anti-discrimination policy and participants who did not know of any.

Community

I operationalized the latent variable *Anti-Trans environment* using two indicators: exposure to anti-trans messages and experiences of discrimination in the past 12 months. To measure exposure to anti-trans messages, participants were asked how often in the past 6 months they had encountered negative messages about trans people in various forms of media, including negative stereotypes, derogatory terms, anti-trans opinions, and opposition to the rights of trans people, including gender-affirming care. Participants responded on a 5-point Likert scale from Never to Very often. Responses were dichotomized to indicate low (Never/Rarely/Sometimes) and high (Often/Very often) exposure to anti-trans messaging. One of these variables mapped to the latent factor in the EFA–exposure to anti-trans messages through billboards, yard signs, bumper stickers, flyers, or other types of public in-person advertisement. For the second indicator, participants were asked how many times they were: discouraged by a teacher or advisor from seeking higher education; denied a scholarship; not hired for a job; not given a promotion; fired; prevented from renting or buying a home in the neighborhood you wanted; prevented from remaining in a neighborhood because neighbors made life so uncomfortable; hassled by the police; denied a bank loan; denied service by a store/restaurant employee,

plumber, mechanic, or service provider; or denied medical care. Responses were dichotomized into individuals who experienced no discrimination in the past 12 months and those who reported at least one experience of discrimination.

Institutional

I operationalized the latent variable, *Healthcare avoidance,* using two indicators related to the financial accessibility of healthcare and one variable that assessed whether the participant had a regular checkup in the past 12 months. First, participants were asked whether they had postponed or delayed medical care: (1) when they were sick or injured, and (2) such as checkups or other preventative medical care because they could not afford it (binary yes/no). Second, participants were asked, '*In the past year, have you received a routine checkup (e.g., general physical exam)?*' to which they could respond yes or no. In the model, this variable was reverse-coded such that individuals who did not have a regular checkup in the past 12 months had high healthcare avoidance.

Interpersonal

The latent variable, *Social support,* was operationalized by three instrumental support questions. Participants were asked how often someone is available: 1) to get together for relaxation, 2) to understand their problems, and 3) to make them feel loved or wanted, and could respond on a 5-point Likert scale ranging from None of the time to All of the time. Responses to each question were dichotomized to indicate low (None of the time/A bit of the time/Some of the time) and high (Most of the time/All of the time) instrumental support.

Outcome variable

Participants were asked whether or not they wanted to become a parent, to which they could respond *'Yes, I am currently in the process of trying to become a parent (for example, through adoption, fostering, pregnancy, surrogacy, or another method)', 'Yes, I want to become a parent at some point within the next 5 years', 'Yes, I want to become a parent at some point in the future, more than 5 years from now', 'No', or 'Don't know/Not sure.'* In bivariate analyses, the responses remained disaggregated. In the models, responses were dichotomized to either Yes or No, and individuals who had responded that they were unsure were removed from the final analysis (n = 37).

Analysis

I prepared descriptive statistics (ie. means and percentages) and bivariate analyses (ie. χ^2) to determine patterns of association between the outcome and independent variables (Table 1). Participants who responded "Yes" to current parent were not asked if they would like to become a parent in the future; therefore, χ^2 was not calculated to test an association between these two variables.

I tested the hypothesized models using Structural Equation Modeling (SEM), a statistical approach used to evaluate the relationships among observed and latent variables within a theoretical framework.[26] SEM enables researchers to test whether a proposed model adequately represents the data by assessing overall model fit. Typically, an initial model is specified a priori, informed by a theoretical framework and prior research, and modifications may be made to find a model that is parsimonious and has optimized model fit, provided they are theoretically justifiable. While a well-fitting model may support the plausibility of hypothesized relationships, SEM cannot confirm causality on its own. Although SEM has been widely used in psychology, it

is increasingly applied in public health research to explore complex pathways among behavioral, social, and environmental factors.[27,28]

In the SEMs, analysis was restricted to individuals who had responded to each of the variables included in the model, and analytic sample sizes were n=654 for Hypothesis 1 and n=656, for Hypothesis 2. The decision to use complete case analysis was made because there was a low proportion of missingness in the variables of interest (<8%) and no observed pattern to missingness. Prior to running SEM, I conducted a multicollinearity test using variance inflation factor (VIF), and determined there were no multicollinearities between independent variables (all VIFs<1.70, indicating a low degree of multicollinearity among variables, see Figures 7 and 8). The final models were standardized and controlled for age, geographical location, and financial security. To determine overall model fit I looked for standard cut-off points for SEM: 1) χ^2 badness-of-fit index ($p>0.05$), 2) robust root mean square error approximation (RMSEA <0.08), (3) comparative fit index (CFI >0.90), (4) Tucker Lewis index (TLI >0.90), and standardized root mean square residual (SRMS <0.08). Models were adjusted and simplified *a posteriori*, in line with the standard practice of model generation, to achieve an acceptable model fit. Analyses were conducted using the lavaan package in R, and two-tailed tests were used to determine significance ($p<0.05$).

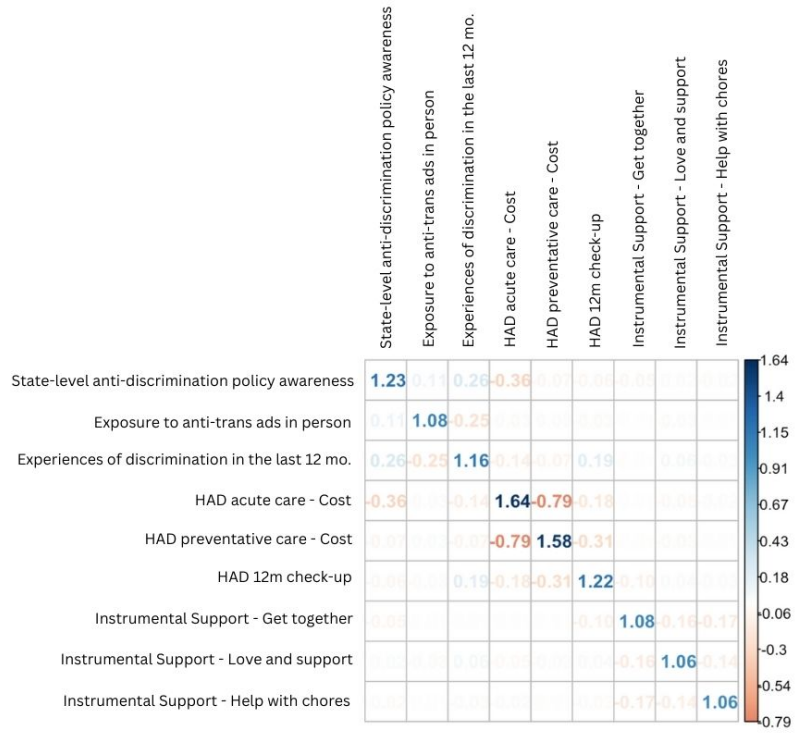

Figure 7. Correlation Plot Showing Multicollinearity for Variables in Hypothesized Model 1.

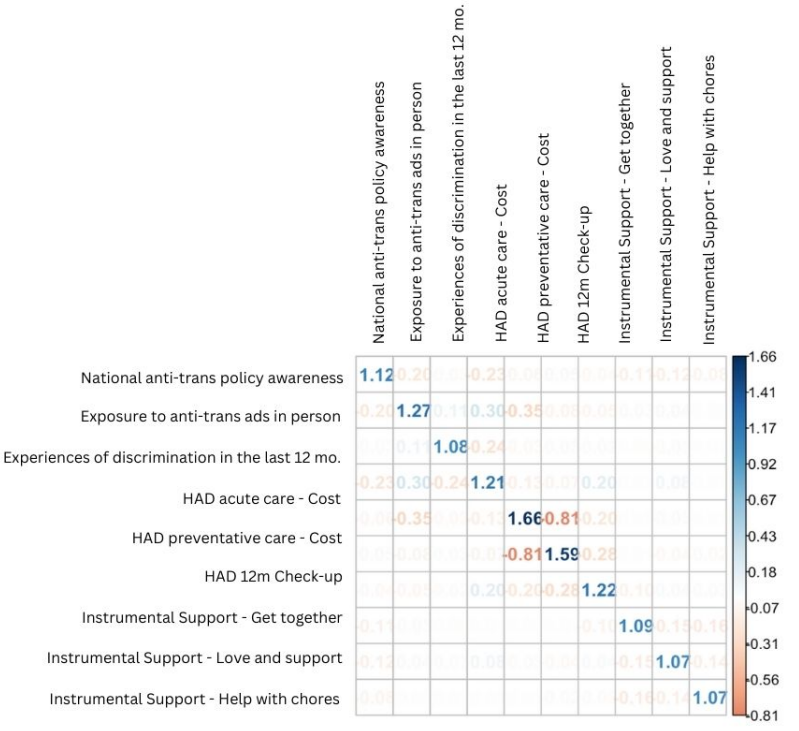

Figure 8. Correlation Plot Showing Multicollinearity for Variables in Hypothesized Model 2.

Results

Sample characteristics

A comprehensive overview of sample demographics as well as socioecological variables is provided by outcome in Table 1. The majority of participants were White, non-Hispanic (n = 481, 60.35%), young adults under the age of 30 (n=455, 57.09%), trans women (n=653, 83.93%), and assigned male sex at birth (n=669, 83.84%). Most participants reported stable housing in the last 12 months (n=773, 96.99%), with the majority being renters (n=426, 53.45%), followed by homeowners (n=261, 32.75%). Respondents were geographically spread out within Washington state, with the largest proportion living in large cities (n=308, 38.64%), followed by small cities or towns (n=228, 28.61%), suburbs near a large city (n=158, 19.82%), and then rural areas (n=103, 12.92%). The majority of participants reported lower education levels of high school/GED or less (n=466, 53.32%) and an annual income ≤ $49,999 (n=466, 58.47%). Still, the majority reported they are getting by financially (n=475, 59.60%) and most have health insurance (n=790, 99.12%).

While most participants had high awareness of national anti-trans policies (n=531, 66.62%), only 27.85% (n=222) knew of at least one state-level anti-discrimination policy. Approximately a third of participants (n=312, 39.15%) had high exposure to anti-trans messages. However, the majority of participants (n=602, 75.53%) reported at least one experience of discrimination in the last 12 months. Healthcare avoidance in this sample was low, with each measure showing approximately 9% of participants avoided preventative care, acute care, or a routine checkup in the past 12 months. For all instrumental support measures, about half of the participants reported high instrumental support.

The majority of the study population are interested in becoming a parent (n=470, 59.0%). Most participants are not currently parents (n=774, 97.11%). One third of respondents (n=267,

33.50%) are not interested in becoming parents in the future, while 5% were unsure (n=37). Among the remaining respondents who are interested in having children, 20.33% (n=162) would like to have a child in more than 5 years, 24.84% (n=198) within the next five years, and 13.80% (n=110) are currently in the process.

Table 1. Descriptive Statistics for Overall Sample

	Total study population		Do you want to become a parent?										
			No (n=267)		Don't Know/Not Sure (n=37)		Yes, in more than 5 years (n=162)		Yes, in next 5 years (n=198)		Yes, currently in process (n=110)		p-value
Demographics	n	%	n	%	n	%	n	%	n	%	n	%	
Age (Mean, SD)	28.9 (4.44)												
18 - 29 years old	455	57.09%	182	68.16%	30	81.08%	86	53.09%	108	54.55%	46	41.82%	
≥ 30 years old	342	42.91%	85	31.84%	7	18.92%	76	46.91%	90	45.45%	64	58.18%	< 0.0001
Gender													
Woman, including trans women	653	81.93%	198	74.16%	21	56.76%	133	82.10%	186	93.94%	108	98.18%	
Man, including trans men	77	9.66%	37	13.86%	7	18.92%	12	7.41%	6	3.03%	2	1.82%	
Nonbinary, including gender nonconforming and genderqueer	63	7.90%	30	11.24%	9	24.32%	15	9.26%	6	3.03%	0	0.00%	
Two-Spirit	4	0.50%	2	0.75%	0	0.00%	2	1.23%	0	0.00%	0	0.00%	< 0.0001
Sex assigned at birth													
Male	669	83.94%	208	77.90%	22	59.46%	135	83.33%	187	94.44%	108	98.18%	
Female	127	15.93%	59	22.10%	15	40.54%	27	16.67%	11	5.56%	2	1.82%	
Intersex	1	0.13%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	< 0.0001
Employment													
Employed	705	88.46%	223	83.52%	24	64.86%	139	85.80%	191	96.46%	110	100.0%	
Self-employed (e.g. own business)	19	2.38%	9	3.37%	0	0.00%	5	3.09%	4	2.02%	0	0.00%	
Out of work/Unemployed	21	2.63%	12	4.49%	3	8.11%	3	1.85%	2	1.01%	0	0.00%	
Student	47	5.90%	22	8.24%	8	21.62%	15	9.26%	1	0.51%	0	0.00%	
Unable to work	4	0.50%	0	0.00%	2	5.41%	0	0.00%	0	0.00%	0	0.00%	< 0.0001
Geographical Location													
Rural area	103	12.92%	28	10.49%	0	0.00%	24	14.81%	23	11.62%	28	25.45%	
Small city or town	228	28.61%	63	23.60%	7	18.92%	52	32.10%	80	40.40%	22	20.00%	
Large city	308	38.64%	125	46.82%	25	67.57%	56	34.57%	51	25.76%	36	32.73%	
Suburb near a large city	158	19.82%	51	19.10%	5	13.51%	30	18.52%	44	22.22%	24	21.82%	< 0.0001
Housing in last 12m													
No	23	2.89%	14	5.24%	1	2.70%	5	3.09%	1	0.51%	1	0.91%	
Yes	773	96.99%	253	94.76%	36	97.30%	157	96.91%	197	99.49%	109	99.09%	0.026

Housing status													
Homeowner	261	32.75%	75	28.09%	2	5.41%	52	32.10%	60	30.30%	57	51.82%	
Renter	426	53.45%	121	45.32%	26	70.27%	88	54.32%	133	67.17%	52	47.27%	
Lessee	56	7.03%	34	12.73%	6	16.22%	12	7.41%	4	2.02%	0	0.00%	
Other	28	3.51%	21	7.87%	2	5.41%	5	3.09%	0	0.00%	0	0.00%	< 0.0001
Education													
High school/GED or less	425	53.32%	123	46.07%	9	24.32%	83	51.23%	129	65.15%	80	72.73%	
Some college or more	372	46.68%	144	53.93%	28	75.68%	79	48.77%	69	34.85%	30	27.27%	< 0.0001
Income													
≤ $49,999	466	58.47%	161	60.30%	30	81.08%	96	59.26%	125	63.13%	45	40.91%	
≥ $50,000	309	38.77%	93	34.83%	3	8.11%	63	38.89%	71	35.86%	65	59.09%	< 0.0001
I am getting by financially													
No	322	40.40%	90	33.71%	17	45.95%	69	42.59%	104	52.53%	35	31.82%	
Yes	475	59.60%	177	66.29%	20	54.05%	93	57.41%	94	47.47%	75	68.18%	< 0.01
Health Insurance													
No	3	0.38%	3	1.12%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	
Yes	790	99.12%	262	98.13%	37	100.0%	160	98.77%	198	100.0%	110	100.0%	0.2195
Race/Ethnicity													
White	481	60.35%	169	63.30%	25	67.57%	93	57.41%	121	61.11%	63	57.27%	
Person of Color	315	39.52%	97	36.33%	12	32.43%	69	42.59%	77	38.89%	47	42.73%	
American Indian/Alaskan Native	13	1.63%	5	1.87%	4	10.81%	2	1.23%	0	0.00%	1	0.91%	
Asian/Asian American	99	12.42%	26	9.74%	3	8.11%	28	17.28%	25	12.63%	13	11.82%	
Black/African American	108	13.55%	41	15.36%	0	0.00%	20	12.35%	26	13.13%	19	17.27%	
Hispanic, Latino, or Spanish origin	79	9.91%	16	5.99%	3	8.11%	16	9.88%	26	13.13%	14	12.73%	
Middle Eastern/North African	9	1.13%	5	1.87%	1	2.70%	2	1.23%	0	0.00%	0	0.00%	
Native Hawaiian/Pacific Islander	14	1.76%	8	3.00%	1	2.70%	3	1.85%	1	0.51%	0	0.00%	0.5734
Current Parent													
No	774	97.11%	267	100.0%	37	100.0%	162	100.0%	198	100.0%	110	100.0%	
Yes	21	2.63%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	-
Policy Level Variables													
How aware are you about anti-transgender bills in the United States?													
Low	264	33.12%	80	29.96%	12	32.43%	34	20.99%	104	52.53%	31	28.18%	
High	531	66.62%	185	69.29%	25	67.57%	128	79.01%	94	47.47%	79	71.82%	< 0.0001
The transgender rights law in my state makes it illegal to discriminate against people based on their gender identity and expression.													
Aware of no anti-discrimination policies	575	72.15%	150	56.18%	10	27.03%	118	72.84%	182	91.92%	109	99.09%	
Aware of at least one anti-discrimination policy	222	27.85%	117	43.82%	27	72.97%	44	27.16%	16	8.08%	1	0.91%	< 0.0001
Community Level Variables													
Experiences of discrimination in the past 12 mo.													
None	155	19.45%	67	25.09%	21	56.76%	22	13.58%	39	19.70%	0	0.00%	
At least one	602	75.53%	174	65.17%	14	37.84%	134	82.72%	157	79.29%	110	100.0%	< 0.0001

Exposure to Anti-trans In-person Ads													
Low	483	60.60%	177	66.29%	32	86.49%	95	58.64%	115	58.08%	50	45.45%	
High	312	39.15%	90	33.71%	5	13.51%	65	40.12%	83	41.92%	60	54.55%	< 0.0001
Institutional Level Variables													
I postponed or did not try to get medical care when I was sick or injured because I could not afford it.													
No	698	87.58%	213	79.78%	25	67.57%	147	90.74%	190	95.96%	108	98.18%	
Yes	73	9.16%	38	14.23%	6	16.22%	12	7.41%	8	4.04%	2	1.82%	< 0.0001
I postponed or did not try to get check-ups or other preventative medical care because I could not afford it.													
No	673	84.44%	193	72.28%	20	54.05%	144	88.89%	190	95.96%	109	99.09%	
Yes	74	9.28%	42	15.73%	7	18.92%	12	7.41%	8	4.04%	1	0.91%	< 0.0001
In the past year, have you received a routine checkup (e.g., general physical exam)?													
No	67	8.41%	34	12.73%	6	16.22%	16	9.88%	5	2.53%	2	1.82%	
Yes	724	90.84%	229	85.77%	31	83.78%	145	89.51%	192	96.97%	108	98.18%	< 0.0001
Interpersonal Level Variables													
How often is someone available... - To get together with you for relaxation?													
Low	400	50.19%	116	43.45%	17	45.95%	77	47.53%	123	62.12%	58	52.73%	
High	395	49.56%	151	56.55%	20	54.05%	83	51.23%	75	37.88%	52	47.27%	< 0.01
How often is someone available... - To understand your problems?													
Low	401	50.31%	125	46.82%	21	56.76%	78	48.15%	115	58.08%	51	46.36%	
High	394	49.44%	142	53.18%	16	43.24%	82	50.62%	83	41.92%	59	53.64%	0.1104
How often is someone available... - To love you and make you feel wanted?													
Low	396	49.69%	120	44.94%	20	54.05%	85	52.47%	107	54.04%	53	48.18%	
High	399	50.06%	147	55.06%	17	45.95%	75	46.30%	91	45.96%	57	51.82%	0.2840

Bivariate analysis

Bivariate test results are displayed in Table 1. Most demographic variables were significantly associated with the outcome, excluding health insurance and race/ethnicity. Variables included in the theoretical model were all significantly associated with parental desire, except for two of the three instrumental support variables. Compared to not wanting to have children or being unsure, a significantly higher proportion of those reporting wanting children in the next five years or currently being in the process reported being ≥30 years old, trans women, assigned male at birth, employed, having stable housing in the past 12 months, and having lower education levels. A significantly higher proportion of those reporting not wanting children or being unsure lived in a large city ($p<0.0001$). Current homeowners, individuals with a higher

income, and those who report they are getting by financially were more likely to be currently in the process of becoming parents ($p<0.01$).

A significantly high proportion of participants who were aware of at least one state-level anti-discrimination policy reported not wanting children, while those who were not aware of anti-discrimination policies were more likely to report wanting children within the next 5 years or currently being in the process ($p<0.0001$). While a high proportion of individuals with a low awareness of national anti-trans policies want children in the next 5 years, individuals with a high national policy awareness made up the majority of individuals who wanted children in more than 5 years and who were currently in the process of becoming a parent. Individuals who had at least one experience of discrimination in the past 12 months were more likely to want to become a parent than those who reported no discrimination experiences ($p<0.0001$). Similarly, individuals who had low exposure to anti-trans messaging made up a high proportion of individuals who did not want children or were unsure.

For all three measures of healthcare avoidance, there was a higher proportion of individuals who had delayed or not received care who indicated they did not want children or were unsure compared to those who had not postponed care. One institutional support variable had statistically significant results ($p<0.01$) that indicated that a higher proportion of individuals with low institutional support were interested in having children in the next five years compared to individuals with high institutional support.

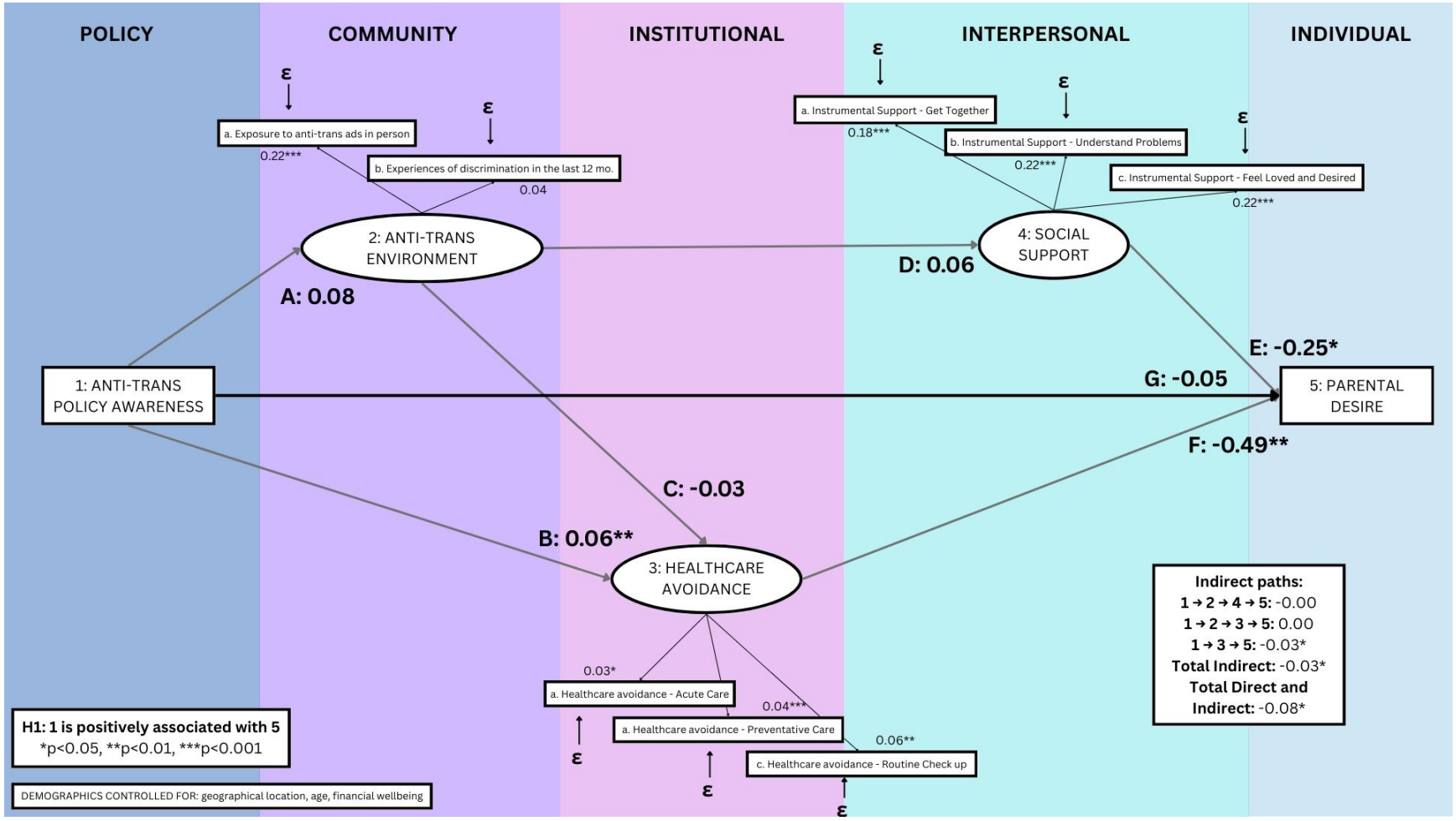

Figure 9. Final standardized and adjusted parameter estimates model denoting relationship between anti-trans policy awareness and parental desire. Error variance terms for measured variables are shown as ε. Model is adjusted for geographical location, age, and financial wellbeing. The overall fit of the standardized SEM model was acceptable based on χ^2 goodness-of-fit test (χ^2=201.74, p<0.001), RMSEA=0.07 (90%CI: 0.07-0.08), and SRMS=0.07. However, the comparative fit index (CFI=0.78) and Tucker Lewis index (TLI=0.70) were slightly low.

Final standardized and adjusted structural equation models

Hypothesis 1: National anti-trans policy awareness is negatively associated with parental desire

The overall fit of the standardized SEM model was acceptable based on χ^2 goodness-of-fit test (χ^2=201.74, p<0.001), RMSEA=0.07 (90%CI: 0.07-0.08), and SRMS=0.07 (Figure 9). However, the comparative fit index (CFI=0.78) and Tucker Lewis index (TLI=0.70) were slightly low.

Significant associations were found between relationships of (1) anti-trans policy awareness and healthcare avoidance (B: β=0.06, p<0.01), (2) healthcare avoidance and parental desire (F: β=-0.49, p<0.01), and (3) social support and parental desire (F: β=-0.25, p<0.05). Positive relationships were found between (1) anti-trans policy awareness and anti-trans environment, and (2) anti-trans environment and social support. A negative relationship was found between anti-trans environment and healthcare avoidance. Although not statistically significant, there was a negative relationship between anti-trans policy awareness and parental desire (G: β=-0.05, p=0.183).

Full mediation was observed in one path, such that healthcare avoidance fully mediated the relationship between anti-trans policy awareness and parental desire (β=-0.03, p<0.05). Other indirect paths between anti-trans policy awareness and parental desire (through anti-trans environment and social support) were not statistically significant, suggesting no evidence for other mediating variables.

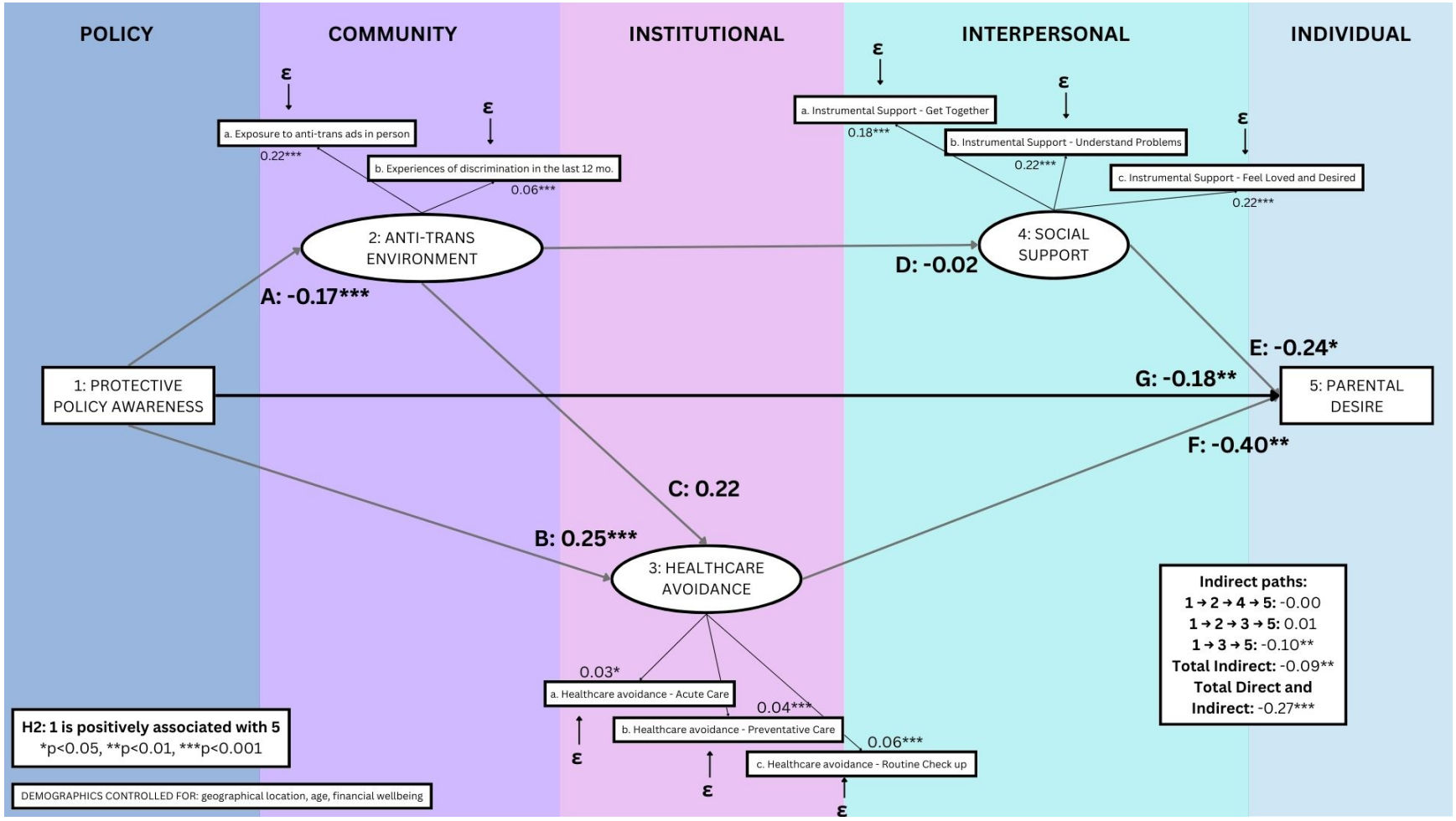

Figure 10. Final standardized and adjusted parameter estimates model denoting relationship between state-level protective policy awareness and parental desire. Error variance terms for measured variables are shown as ε. Model is adjusted for geographical location, age, and financial wellbeing. The overall fit of the standardized SEM model was acceptable based on $\chi 2$ goodness-of-fit test ($\chi 2$=167.69, p<0.001), RMSEA=0.06 (90%CI: 0.05-0.07), and SRMS=0.06. Although the comparative fit index (CFI=0.84) and Tucker Lewis index (TLI=0.79) were improved compared to the first model, they were still lower than expected.

Hypothesis 2: State-level protective policy awareness is positively associated with parental desire

The overall fit of the standardized SEM model was acceptable based on χ^2 goodness-of-fit test (χ^2=167.69, p<0.001), RMSEA=0.06 (90%CI: 0.05-0.07), and SRMS=0.06. Although the comparative fit index (CFI=0.84) and Tucker Lewis index (TLI=0.79) were improved compared to the first model, they were still lower than expected.

There was a statistically significant positive association between protective policy awareness and healthcare avoidance (B: β=-0.25, p<0.001). The remaining significant associations showed a negative relationship between: (1) protective policy awareness and anti-trans environment (A: β=-0.17, p<0.001), (2) social support and parental desire (E: β=-0.24, p<0.05), (3) healthcare avoidance and parental desire (F: β=-0.40, p<0.01), and (4) protective policy awareness (G: β=-0.18, p<0.01). There were non-significant relationships between (1) anti-trans environment and healthcare avoidance and (2) anti-trans environment and social support.

Partial mediation was observed in one path, such that healthcare avoidance partially mediated the relationship between protective policy awareness and parental desire (β=-0.10, p<0.05). Other indirect paths (through anti-trans environment and social support) were not statistically significant, suggesting no evidence for other mediating variables.

Discussion

This study aimed to investigate multi-level factors that influence parental desire among trans adults. To my knowledge, this is the first study to develop and test a theoretical model mapping how political, community, institutional, and social barriers shape desire for parenthood in this population. Among the study sample, consisting of trans adults living in Washington State

in 2023, a substantial proportion expressed interest in becoming a parent (59.0%). This number was comparable to prior studies reporting moderately high parental desire among trans individuals.[2,29,30] However, the amount of trans people in the sample who were already parents (2.6%) is much lower than previous estimates (up to 19%).[1,31] My findings identify healthcare avoidance as a key mediator between policy-level determinants and parental desire, suggesting that barriers to healthcare contribute not only to disparities in access to care but also to trans peoples' reproductive decisions. These findings support qualitative work documenting the stigma and discrimination that trans people face in medical settings, particularly on their path to parenthood.[11] Additionally, these findings highlight the need to understand parental desire within the broader context of anti-trans political and social environments.

I found that both healthcare avoidance and social support were significantly associated with parental desire. Overall, healthcare avoidance was low in the study population. This could potentially be due to the larger study setting—Washington state has shield laws protecting clinicians who provide gender-affirming and reproductive healthcare; comprehensive coverage for GAHC by public insurance companies; and a high concentration of gender-affirming care clinics.[32,33] Additionally, most of the study participants had insurance coverage. Although healthcare avoidance was low in the study population, it still significantly mediated the relationship between policy and parental desire. This finding calls attention to the role that institutional barriers serve in influencing trans peoples' reproductive health decisions. Healthcare avoidance is high in trans populations, who often face structural and interpersonal violence within medical settings. Based on my findings, better understanding and addressing remaining barriers to healthcare, even within the context of protective states, is an important area for future work.

The finding that there was a significant and negative relationship between social support and parental desire—such that individuals with high instrumental support were less likely to want to become parents—was surprising, given the stated importance of social support in supporting trans individuals on their paths to parenthood. One possible explanation is that previous studies have largely been qualitative and have predominantly consisted of trans populations assigned female at birth, limiting their generalizability. Another possibility is that social support serves a protective factor that allows individuals to affirm their reproductive autonomy, including their decision not to pursue parenthood. Further research is needed to better understand the role different forms of social support play in reproductive decision-making among trans populations.

Another unexpected result was the significant, negative association between state-level protective policy and parental desire. Previous analyses with the same study population indicated that protective policy awareness was associated with decreased anxiety and depression symptoms, other studies have said the same. However, preliminary results from PATH's qualitative interviews provide further context; although individuals are aware of anti-discrimination policies, many perceive these policies as performative or inconsistently implemented. Moreover, greater structural support for both GAHC and reproductive care, may also reflect trans individuals' autonomy to prioritize other goals over their choice to not become a parent.

Both the socioecological model and the ecosocial theory of disease distribution illustrate that individual level interventions are not sufficient in addressing complex public health issues, especially those rooted in in systemic oppression. Achieving long-term health equity for trans populations will require multi-level interventions which address the political and institutional

violence that trans people face. Supporting trans peoples' paths to parenthood—and their decisions to not have children—requires addressing the structural conditions that limit bodily autonomy, including discriminatory policy, inaccessible healthcare, and social stigma.

This study is not without limitations. Firstly, several of the measures including in the survey that were selected for this analysis had low internal reliability, particularly for community and interpersonal variables. To counteract this, individual items from the larger measures were included in EFAs to best understand which questions most accurately reflect the underlying construct. Additionally, the overrepresentation of trans women in this sample is both a strength and a limitation. On one hand, trans women have historically been underrepresented in trans health research and broader health studies, making their inclusion in this study incredibly valuable. On the other, this overrepresentation may limit the generalizability of findings related to reproductive health. Trans men and nonbinary individuals assigned female at birth often interact with reproductive healthcare systems more frequently, particularly in the context of fertility preservation, contraception, pregnancy, and gynecological care. This results in distinct considerations when making reproductive decisions and those experiences may not be fully captured by this study. Generalizability is also limited by overrepresentation of White individuals in the study population. Further attention to intersectional systems of oppression that impact trans people of color, especially in reproductive healthcare decision making, is a valuable area for further research. Additionally, while looking at policy awareness as an exposure can provide valuable insight, this study was conducted within the context of a state with a largely protective environment for trans residents. Further research in states which have implemented anti-trans policies should be conducted to better understand the practical limitations these policies impose.

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Chapter 4

Vilifying or validating? The political impact of biological essentialism

Introduction

Biological essentialism refers to the idea that our identity and traits are intrinsic, objective, and solely biological.[1,2] It has been applied to trans people in two senses: (1) promoting sex as a purely biological, static, and immutable characteristic, and (2) hypotheses claiming that there is a biological, causal basis for gender dysphoria or someone's gender identity. Genetic essentialism is the narrower view that identity and traits are solely determined by genes.[3] These frameworks shape not only social attitudes and stigma towards trans people, but also genetic research with trans populations and broader policies.

Anti-trans policies often utilize "biology" to limit trans individuals' autonomy and self-determination. Bathroom bans, which prohibit trans people from using public restrooms aligned with their gender identity, define gender based on one's external anatomy and reproductive capacities as a means to exclude trans peoples' rights to public accommodations. National-, organizational-, and school-level policies describe "biological advantages" held by trans athletes to prevent their participation in sports. Most recently, policies have redefined sex based on someone's reproductive tissue, citing the "biological reality of sex" that trans people are purportedly ignoring. Policies have been introduced in state legislatures, though not passed, that would require genetic testing to verify sex chromosomes to ban trans students from participating in sports and prevent state funding for institutions that correctly gender trans individuals.[4]

At the same time, pro-trans political arguments use biological language to promote civil rights for queer people.[5] Conceptually, "sex" is a site of political struggle,[6] where one side narrowly defines it as an immutable characteristic and the other argues for an expanded definition that considers sex within larger cultural, social, and political contexts.[7] Indeed, broader conceptualizations of sex have been successful in securing political rights for trans people. Additionally, "causal theories" that support biological or genetic sources for trans identities are

personally validating and many believe they could be persuasive in swaying public opinion about trans people.[1,5] The "born this way" narrative, which reinforces the idea that there is an innate predetermination to queer-ness, has been employed to counter moral, religious, and pathologizing discourses by appealing to scientific objectivity.[5] However, this approach has been critiqued for reinforcing essentialist notions and further pathologizing queer identities.[5,8–10] The two roles of biological essentialism as both a tool for marginalization and a source of validation illustrates the complex context in which trans identities and rights are negotiated.

Although the recent increase in anti-trans policies through the U.S. is unprecedented, the search for and bipartisan support of a "causal" theory to trans identity is not novel; rather, it continues a history of eugenic practices that have targeted queer people throughout the 20th century and leading up to today. Trans people have long been subject to pathologization and medicalization, from eugenic family studies in the early 1900s to mid-century experimental medical "treatments."[10,11] Today, this legacy persists in ongoing efforts to locate a biological or genetic basis for gender identity. Early research took the form of twin and family studies, which aimed to assess the heritability of trans identity and found some suggestive evidence of genetic influence.[12] The methods used in these studies have evolved in parallel with advances in genetic technologies—moving from cytogenetic analyses of karyotypes,[13] candidate gene studies,[14] and eventually to whole exome sequencing.[15] Despite the scientific advancements and some findings that support genetic correlation with trans identity, these studies face methodological limitations, especially in terms of replicability. The motivation of the research varies, with some people wanting to find a biological source to guide clinical treatment of gender dysphoria and others believing that it will provide justification for trans peoples' existence.

Very little research has explored trans peoples' perspectives on trans identity genomics research (TIGR). The limited work that does exist reveals conflicting views. Trans individuals have raised their concerns about the potential for TIGR to cause harm by reinforcing essentialist discourses or leading to eugenic practices.[1,16] Still, this research is largely viewed as beneficial and useful to guiding medical care and supporting trans rights. Given the high political stakes for trans communities at the present moment, it is crucial that genetic researchers studying gender identity understand the political and social impact of their work. TIGR cannot be separated from a history of eugenics practices or the current political environment in which trans rights are being contested.

This study seeks to understand how trans adults in the U.S. view TIGR in the context of the current political environment. Specifically, I explore the following research questions:

- How are macro-level discourses in policy internalized at an individual level?
- Who decides what makes someone's gender identity "real"?
- How is biological essentialism weaponized against trans people in public policy?

Methods

Participants were recruited through the study's geographically and professionally diverse Executive Stakeholder Board (ESB), a group of transgender, nonbinary, and gender diverse community members; advocates; clinicians; health equity scholars; and ethical, legal, and social implications of genomics researchers. Recruitment materials were distributed to ESB members who then distributed amongst professional organizations, clinic populations, community-based organizations, and personal networks. Flyers instructed individuals to contact the study email if they were interested in participating. Potential participants were then emailed the link to a short

screening survey on Mount Sinai's HIPAA-compliant REDCap system to determine eligibility. Individuals were eligible if they were over the age of 18; lived in the United States; and identified as transgender, nonbinary, or gender diverse. The link for the screening survey was not shared online or in recruitment materials to prevent bots or fraudulent activity. Participants were purposively sampled to ensure maximum variation in the study population, particularly in regards to race, gender identity, sex assigned at birth, and geography. Individuals were sampled from 50 states representing continuum of policy environments from outright discriminatory to protective (Table 1).

Interview guides were developed by the study team in collaboration with the ESB, and topics included trans-identity genomic research, acceptability of genetic research, and policy (Supplement 1). Interviews took place over Zoom and lasted approximately 60 minutes. At the end of the interview, participants were asked to complete a detailed demographic survey online. Interviewers took detailed field notes during and following interviews on potential themes and general impressions of conversations. Recordings were sent to Mount Sinai's transcription services. Interviews took place from June through September of 2024.

Atlas.ti was utilized for analysis. A codebook was developed based on the interview guide with additions and changes made throughout the coding process. Three authors (ED, DM, and IR) coded the interviews, meeting regularly for reconciliation meetings. Intercoder agreement ranged from 0.623-0.872. The analysis was informed by discursive practices—the understanding that language is used purposefully and to uphold systems of power—to understand how "biology" and "genetics" are used to define gendered realities and how this upholds systems of power and oppression. To accomplish this, reflexive thematic analysis was used to identify and organize key themes related to biological essentialism.[17] Reflexive thematic analysis is an

appropriate methodology because its flexibility allowed us to approach the dataset with a master discourse defined deductively, while allowing an inductive approach to analysis through letting the participants' thoughts around the master discourse guide the development of themes. Study methods were approved and determined to be exempt by Mount Sinai and the University of Michigan's IRBs.

Results

Participant Demographics

Table 1 provides a summary of participant demographics, and a more detailed breakdown is available in Supplemental Table 1. The average age of participants was 34 years (range=19-73). Thirty-nine percent were nonbinary, 39% trans women, and 22% trans men. 61% of respondents were people of color. Among the 14 interviewees who indicated they had a disability, the most commonly reported were attention deficit (50%), autism (43%), health-related disability (13%), and mental health condition (13%). The study population had a high education, with 20 (65%) completing bachelor's or graduate degrees.

Table 1. Demographic Characteristics of Participants (n=31)

Characteristics	**M ± SD or *n* (%)**
Age	33.6 ± 12.2
Gender	
Nonbinary	12 (38.7%)
Transgender man	7 (22.6%)
Transgender woman	12 (38.7%)
Two-Spirit	
No	30 (96.8%)

Yes	1 (3.2%)
Sex assigned at birth	
Female	18 (58.1%)
Male	13 (41.9%)
Intersex	
No	24 (77.4%)
Yes	1 (3.2%)
Don't know	6 (19.4%)
Race/Ethnicity*	
American Indian or Alaskan Native	1 (3.2%)
Asian	5 (16.1%)
Black or African American	7 (22.6%)
Hispanic or Latino/a/x/e	4 (12.9%)
Middle Eastern or North African	2 (6.5%)
Native Hawaiian or Pacific Islander	1 (3.2%)
White	16 (51.6%)
Nativity	
No	5 (16.1%)
Yes	26 (83.9%)
Education	
Some high school or less	1 (3.2%)
Completed high school (or GED)	2 (6.5%)
Some college or associate degree	8 (25.8%)
Completed college/bachelor's degree	4 (12.9%)
Technical/vocational school	0 (0.0%)
Some graduate school	4 (12.9%)
Completed graduate school	12 (38.7%)
Income	
≤$24,999	8 (25.8%)
$25,000-$49,999	5 (16.1%)
$50,000-$74,999	7 (22.6%)

$75,000-$99,999	4 (12.9%)
$100,000-$124,999	3 (9.7%)
$125,000-$149,999	1 (3.2%)
≥$150,000	2 (6.5%)
Don't know	1 (3.2%)
Disability Status	
No	15 (48.4%)
Yes	14 (45.2%)
Choose not to answer	2 (6.5%)
Geographical Location	
East North Central (IL, IN, MI, OH, WI)	3 (9.7%)
East South Central (AL, KY, MS, TN)	1 (3.2%)
Middle Atlantic (NJ, NY, PA)	6 (19.4%)
Mountain (AZ, CO, ID, MT, NM, NV, UT, WY)	1 (3.2%)
New England (CT, ME, MA, NH, RI, VT)	6 (19.4%)
Pacific (AK, CA, HI, OR, WA)	5 (16.1%)
South Atlantic (DE, FL, GA, MD, NC, VA, SC, Washington D.C., WV)	5 (16.1%)
West North Central (IA, KS, MN, MO, ND, NE, SD)	1 (3.2%)
West South Central (AR, LA, OK, TX)	2 (6.5%)
Prefer not to answer	1 (3.2%)
**Individuals could select more than one response*	

TIGR walks a tightrope of validating or vilifying trans identity

<u>*Validating*</u> - "There are so many people that think being queer is fake or a phase. Having a genetic component to it does kind of give it more validity medically as being a condition that can help spur further rights and research." - 26 yo, Asian, Agender/Gender nonconforming/ Genderqueer/Nonbinary

Several participants believed that a genetic marker for trans identities would be personally validating, stating that it could help remove the shame or grief they felt early in their transition as they were beginning to understand their gender identity. Knowing that there was a

genetic reason that "caused" them to be trans would provide peace of mind and reassurance that they were "born this way" or that their identity was predetermined. This was seen as the biggest benefit and "North Star" of TIGR:

> *"I think the time where it would have been the most helpful to me personally to know would have been very early in transition. To have some sense of… 'Yeah, this is really happening, this is really real.' You know? I can maybe imagine a world where like… I don't know, this still feels too close to dystopia, but here's a way that it would help: I started crossdressing before I acknowledged that I was trans. And at the time I thought it was a fetish and I thought it was bad and I had all kinds of shame about it. If I could have, say, gotten tested [for a genetic marker for trans identity] then and realized, 'Oh, no, I'm doing this because I'm trans,' that might have saved me some years and some grief and some regret." - 42 yo, White, Gender nonconforming/Transgender/ Transfeminine*

Others said that knowing whether or not they had a genetic marker for their gender identity would not matter to them, stating that this course of research is solely to appease cisgender, heterosexual perspectives. For example, one person said that they do not have conversations about this with other trans people in their life, but cisgender people will often ask them why they think they are trans, and it feels like a nuisance to participate in these conversations. Even though many participants personally don't care if they have a "trans gene," they do believe TIGR is positive if it can prove that there is something genetic underlying gender identity to cisgender people:

> *"No one really talks about those type of things in the [trans] community. It's just out of the [trans] community, because [cisgender people] need some type of proof. They need proof of why it's happening to you and not them. So this genetic study probably is a very good thing, because at worst case it'll get a lot of people to just shut up and finally prove there is something genetically connected." - 37 yo, White, Transgender woman/Transfeminine/Woman*

Among those who said it wouldn't matter to them personally to know if they had a genetic marker for their gender identity, they acknowledge that it could still be personally meaningful for others, especially early on in their transition:

"I think that a lot of trans people would be vulnerable to wanting to know, wanting to have an external authority validate whether they were genuinely trans and whether they would regret transitioning or not at a certain point. So I feel like, yeah, a lot of people would be very tempted to get whatever type of answer they could about that prior to actually transitioning medically or socially in order to have a verified way of seeing whether they would regret it or not and seeing whether they could possibly be happy without doing it or would like have to do it or else they would die or something." - 32 yo, White, Man/Transgender man

When asked about the potential benefits of TIGR, some individuals believed that an underlying genetic marker would "prove" trans identity was real, which would lead to greater public acceptance of trans people. This could be particularly true for religious groups by providing a "gateway to acceptance" or countries where trans people are prosecuted due to their gender expression. Participants could also see TIGR improving access to healthcare services, leading to more financial support for trans advocacy groups, and helping in passing anti-discrimination policies. Overall, many participants believed that more research in trans communities was a net positive, and greater scientific understanding of trans identities would translate to increased public understanding.

"It goes back to the clarity. Once you get a better understanding of the root of something, I think that it opens up a door. Could be negative and positive. But I believe it could be something positive, because if I'm not mistaken, I want to say back in the 70s or the 80s, they looked at [trans-ness] as some type of mental illness, if I'm not mistaken. And so, when you can get down to that, to the bottom of that, that can maybe enlighten them and say, 'Hey, well, this is not some type of mental illness, this is genetic.' And put a little more respect on the transgender." - 40 yo, Black or African American, Transgender woman

Vilifying - *"It just bothers me a lot. That I have to show proof to people that I am truly trans, or I am okay to be trans. Just leave.. Let me be." 32 yo, Middle Eastern or North African, Genderqueer/Transgender woman/Transfeminine*

There was concern among participants of a larger public discourse that trans-ness is not real and trans people are "making it up" or "delusional". Some believed that TIGR could be used to disprove this narrative while others said that genetic research is "not going to be kind of a magic fix" to the discrimination trans people face in their day-to-day lives. There was significant

concern that the search for a "trans gene" is a continuation of a history of pathologization among queer communities. Participants discussed how trans-ness and queer-ness more broadly have been historically and harmfully classified as a "disease" and how trans individuals have been subject to attempted and failed "cures." For this reason, a genetic source of transness could be seen as a "mutation" that would further discrimination against trans individuals, possibly even leading to institutionalization. One participant elaborates on this:

> *"I feel like it's.. this is the new way of this–I call it psychology or like medicalization of being trans. Cis[gender] people or non-trans community will see us as less than, as people who cannot control themselves because there's already a stigma about us. Now you're saying that 'Okay, these people that you have a stigma are biologically this way,' and it reminds me of I don't know, this study of like race and genes, like the way that they "explained" how some races are inferior. I feel like, because there exists a stigma. And they already think that trans people are less than. There is this cissexism going on in society. I feel like naturalizing this transness makes some trans people medically less than, which is very dangerous." - 32 yo, Middle Eastern or North African, Genderqueer/Transgender woman/Transfeminine*

Similarly, a few participants mentioned their fear that genetic correlates of gender identity could be linked to genetic correlates of mental illness, further pathologizing trans identities. They also pointed out that gender incongruence has historically been linked to mental illness in ways that have harmed both trans communities and people with disabilities.

> *"PARTICIPANT: I do think probably some, especially transphobic, people think that at least some trans people falsely believe they're trans because they have no ability to know themselves because of autism specifically. And I could see them–like autism is genetically predetermined–so I guess I could see that. Like if people are like, 'Oh, transness is just this freaky thing that people with developmental disabilities come up with.' It would not be that the transness itself was genetically based necessarily but that the transness was because of --*
>
> *INTERVIEWER: Like some kind of disorder or something.*
>
> *PARTICIPANT: Or like, yeah, maybe some other mental health condition." - 32, White, Man/Transgender man*

The discriminatory argument that trans people are "making it up" could be further exacerbated if TIGR concluded that there was no genetic basis for trans identity. If that were the

case, participants say that transphobes would use the information to add scientific validity to their harmful beliefs that trans people are choosing to be trans, or that being trans is a mental illness. It could also be used politically to restrict trans people's rights. A couple of participants discussed the general dissonance between rigorous scientific research and politics, saying that politics are "not very academically driven". For example, one participant with experience in scientific research says that replicability would be necessary, but even if TIGR determined transness was not genetic, it would not impact their perception of their gender identity:

> *"INTERVIEWER: Let's say they did all of this research, and the conclusion of the research was 'We didn't find any genetic markers, there's no genetic explanation.' What do you think is the impact of that on the public perception of trans people?*
>
> *PARTICIPANT: Well, the radical right would probably use it against us and say, 'See! It is a lifestyle.' Blah, blah, blah, blah, blah. But I mean, I've been in therapy for decades. And for two years prior to my transition, my therapist was asking me to start looking through the lens of gender dysphoria. [...] It's definitely in your brain, in your heart, in your being. And fighting it, hiding it, blocking it, keeping it in the closet and tormenting it, it's just not worth it. If there's no genetic reason for it, no genetic marker that's clearly indicated–and it would have to be a study that can be proven over and over again that this is actually a fact–then some people are going to use it for bad. And some people are going to say, 'Well, I don't care what it says.' And I think I'd be more on the–of I don't care what it says." - 62 yo, American Indian or Alaskan Native/White, Transgender woman/Two-Spirit/Woman*

Additionally, several participants believed that having a genetic test or marker for trans identity would lead to increased medical gatekeeping, which they noted as an existing issue that already needed to be addressed. They call out the fact that even if there is a genetic source for gender identity, it will not be as simple as having a gene or not having it. Many other factors play into how genetic traits present themselves, including environmental interactions and genetic penetrance. However, participants feared it could be treated in a black-and-white manner to limit access to gender-affirming healthcare (GAHC).

> *"I feel like one thing that we'll probably see with, if this trans healthcare stuff works in the cis community's favor, it's probably going to turn into the same thing that neurodivergent folks have to face, which is the argument of whether they are diagnosed*

or not. And if you're diagnosed you get to be in a space and if you're not, you don't." - 23 yo, Asian, Nonbinary/Transmasculine

One participant worried that having a genetic marker for gender identity would lead insurance companies to view trans identity as a pre-existing condition, further limiting access to care. Others noted that if a genetic testing was required to access GAHC, it would introduce an additional financial and logistic hurdle for trans people seeking necessary care.

> *"INTERVIEWER: Then one of the benefits that you said you could think of was for trans youth–if they know that they have this gene or genetic marker, it may help them access something like puberty blockers faster. Right?*
>
> *PARTICIPANT: Yeah, which obviously would be great. But I just feel that the harm outweighs the benefit. For some people who know that young, wonderful, get them into the care pipeline. But even if we had that testing, like accessing care right now–and I'm in Massachusetts, incredibly privileged and not necessarily difficult to access care up here. But in other places, if you needed to submit a genetic test before getting that care, I just think that would go very, very wrong." - 25 yo, White, Nonbinary*

Nearly every participant expressed concerns that information from TIGR could one day be used to advance eugenic strategies against trans people. While most participants believed that the science isn't yet advanced enough to pinpoint a specific genetic marker for trans identity, many feared a future where identifying a so-called "trans gene" could lead to selective abortion, genetic modification of embryos via technologies like CRISPR, or social pressure discouraging trans people from reproducing. These fears were grounded in the historical pathologization of trans people, as well as real-world examples like selective abortions of fetuses with disabilities or intersex traits.

One participant shared the emotional toll of trying to discuss these issues with cisgender people in their life, describing how quickly those conversations veer into eugenic thinking—even from those who don't consider themselves transphobic:

> *"I don't really want to talk to cis people about [a "trans gene"] usually for the same reason why, when there was much more of a public focus about like a quote-unquote gay gene, I also like didn't really want to hear the opinions of straight people on that because*

I don't know, it very quickly starts going down a like, and then we can prevent it-kind of road. Even people who profess not to be homophobic or transphobic will say, 'I'm not saying that you should prevent people from being trans or gay, because that's bad. But discrimination is hard, and maybe some parents aren't equipped to raise LGBTQ kids. So like, maybe it's a good thing if we can prevent people from being trans or gay.' I hate that. It's just like straightforward eugenics. So I try not to talk about this kind of thing with cis people because often it kind of turns into me doing an impromptu trans 101 education thing, which I'm not always interested in doing. I do a lot of that in my professional life and my personal life, but sometimes I just don't want to." - 35 yo, White, Nonbinary/Transgender

Some participants also discussed the internal conflict they felt surrounding selective abortions. While they strongly believed that people should have the right to terminate a pregnancy for any reason, they were disturbed by the idea that someone might choose to do so simply because their child might be trans. They noted that decisions like these, while technically personal, reflect and reinforce harmful societal values and have broader implications for marginalized communities.

When asked how realistic it is that genetic markers could be used to target trans people, several participants said it seemed highly plausible, especially given existing technologies for preimplantation testing of embryos for physical characteristics. Despite their concerns, participants did not advocate for halting this type of research entirely. Instead, they stressed the need for ethical responsibility, particularly in how research is framed and communicated. One participant cautioned, "The more we understand, the easier it is to on the one hand weaponize and on the other hand support" (20 yo, Hispanic or Latino/a/x/e/White, Nonbinary/ Transmasculine). Another participant emphasized the importance of how research findings are framed—not as causal, but as nuanced associations:

"And I think the goal is to get information rather than action. I think that's also more important. Like in the same thing of like this gene is associated with trans people rather than this gene causes, 'cause I think this gene causes can cause stuff like hey, what if we remove that gene? Hey, what if we affect that gene? But hey, if you get this, it means you 100% have to have transness. So I think caution and I guess being careful about wording

and how they want to interpret stuff is also a big deal." - 20 yo, Asian, Genderfluid/Gender nonconforming/Nonbinary/Transgender woman/Transfeminine/Woman

Throughout several interviews, participants referenced the search for the "gay gene" starting in the 90s as a point of reference to understanding the potential harms and benefits of a search for a "trans gene". However, one participant made the important distinction that a search for a "trans gene" would be different in the sense that trans people often, but not always, need access to medical care to affirm their identities and trans communities have already called out medical gatekeeping as a barrier to GAHC. They also argue that the validity of gay identities are not questioned in the same way that trans identities are:

"I feel like with people wanting to find a genetic basis for gayness, it wasn't with the same sort of undercurrent that I feel like there is with transness of figuring out who "deserves" to be trans. Because transness has always had this situation of medical gatekeepers deciding whether someone deserves to be trans or not and gayness does not have that. No one is like do you deserve to have gay sex or not? Because you don't have to do that. And even with something like gay marriage, no one is like, 'Well, are you a real gay person who really deserves to get in a gay marital relationship or should you not be allowed to do this?' So I just feel like… because of this thing with transness where there's like this external authority that determined whether you're "really" trans or not or should be allowed to transition, it's like especially harmful with the transness compared to gayness to be trying to find the genetic basis of it." - 32 yo, White, Man/Transgender man

Policy using biology and genetics to define gender harms everyone

Policy Impact - *"Many people are organizing. Many people are doing other types of work to demystify us, such as people in research. But I'd say for the most part, we're in it really rough, and it's been really hard." - 25 yo, White, Nonbinary/Transgender man/Transmasculine*

When asked how the current political environment has impacted them, there was a resounding expression of anxiety, fear, and frustration among respondents. Many people discussed how their mental health has taken a toll as more anti-trans policies have been introduced, even among participants who live in more trans-friendly states. They also spoke on

how they have been treated without respect or regard for their personhood as a result of growing anti-trans rhetoric. There was a consensus that cisgender people and politicians are not doing enough to support trans rights and that trans people are left to advocate for themselves. This advocacy is expected on top of the individual and structural violence trans people face in their daily lives. For example, one participant spoke about facing homelessness and the stress from her daily life taking her focus away from the political environment, even though she knows that it is important and would impact her.

> *"I take care of my gay kids from–two of them live with me and also I have my biological nephew who identifies as trans and he's 13 and he lives with me. Because of my depression and stuff I wasn't able to work. I'm just now getting back to work and we're trying to figure out this housing stuff. But the landlord just hit me with a–he doesn't want to extend the lease past August 31st. So now we will be five transgendered individuals, out on the streets again, and I'm trying to prevent that [...] And you don't want to not focus on the things that can affect your life even more which is things like Project 2025. But your personal life sometimes just consumes so much of your time that you don't have the chance to just think about anything else." - 37 yo, Black or African American, Transgender woman*

The fear of the current political environment is based on real-life consequences that they either have faced themselves or have impacted their loved ones. They mentioned friends receiving unprovoked visits from Child Protective Services, clinics they worked at receiving bomb threats, experiences of discrimination when using bathrooms aligned with their gender identity, and restricted access to medical providers and GAHC. A couple participants discussed how they've heard people de-transitioning or postponing medical and legal transition, despite not wishing to, out of fear of political violence.

> *"I mean, for myself, I can say that I am responding to these conversations with caution. I'm taking steps to make sure that me and my family are cared for in the eventuality that these rights are taken away. And I know that there's a lot of fear in the trans community about the sort of yo-yo effect of where these rights have gone. I know trans veterans who were dishonorably discharged for being who they are and don't know that there are supports for them to get veterans benefits and things like that. So I think that trans folks are responding to national conversations about transgender rights with fear, with anger, and with caution, generally." - 36 yo, Black or African American/White, Nonbinary*

While some participants have to disengage from political conversations to maintain their mental health or safety, others have felt called to action and advocacy. Several participants discussed that they have been ruminating on the future political environment with the upcoming presidential election, and making "contingency plans" should their situation become unsafe. However, a couple participants expressed the sentiment that while anti-trans political movements seem to be well organized, there is no unified voice among the trans community/fighting for trans rights.

Biology in Policy - "They kind of align it with biology and medicine, but maybe not so much with biological reality" - 25 yo, White, Genderfluid/Nonbinary

Although several people said that they did not hear genetics being specifically discussed in policy, they did recognize that transness was conceptualized as an "illness" or "sickness" by conservative politicians, which could potentially be tied back to biology. They also said they could see a future where TIGR is used against trans people in public policy. One participant expanded on this, saying that even well-intended research has been used to harm marginalized communities:

> *"I think I might have just have a kind of doomsday view on things. I think if it's something that can be used, I can see it being used against the group of people that it's trying to help. History tends to repeat itself, and there's already history of similar things happening. So, while I do think [TIGR] is really important and can help the individual a lot, I can also see it being used for that larger policy conversation. Right now, I think there's just not enough [research] for them to be able to make a policy or bring [TIGR] in to that conversation. I think if it was further along, that might be kind of a different story though." - 25 yo, Hispanic or Latino/a/x/e, Agender/Genderfluid/Gender nonconforming/Gender queer/Nonbinary/Demi-boy*

Many people recognize that biology and genetics are often used in public policy and political campaigns to marginalize or "other" trans individuals. Participants most commonly observed this in arguments that use biology to define who is a "biological" man or woman and to assert that only two sexes or genders exist. Discriminatory statements they reported hearing

included: “there’s only two sexes/genders”, “sex and gender are the same thing”, “gender is biologically based, chromosomal, and immutable”, “you can’t argue with biology–people are either male or female”, “there’s no non-binary”, “your gender is in your genetics”, “sex and biology are simple”, “you're not biologically a woman/man”, “[we] will know you were a woman because your bones are woman-shaped”, and “God created one man and one woman.” While these claims often invoke biology as justification, participants emphasized that they misrepresent biological complexity and reality and are used solely to further political agendas.

> *“PARTICIPANT: [Anti-trans policies] are not about biology. They're just like, ‘Oh, how do we use something that's like ironclad?’ Right? Well, if something’s immutable and unchangeable…*
>
> *INTERVIEWER: Like solid. Lock it down.*
>
> *PARTICIPANT: Right, exactly. Because [they] can't be like, ‘Well, trans people can't come here.’ So [they] have to try to find something that where you can't poke holes. And we have a history of doing that because we did it to Native Americans, and we did it to Black people. [...] No, I don't think any of it is about genetics at all. I think it’s just bigotry. And they're like, ‘Well, what's something that we think is unfightable?’” - 37 yo, White, Nonbinary/Transgender man/Transmasculine*

Biology was used to describe “real” men and women in policies regarding participation in sports. In these cases, policies would often describe a “biological advantage” that trans people who were on gender-affirming hormone treatment had over their competitors. Participants found this to be reductionist, selective, and unbased. A few participants referenced “genetic advantages” held by cisgender athletes–such as wingspan, height, and lung capacity–that are not targeted politically. They said these decisions are arbitrary and use biology to selectively discriminate against trans individuals.

> *“I think the sports [policies] are really dumb because no one is banning Michael Phelps for having a ridiculous wingspan. No one is telling an NBA player, you're too tall, you have a genetic advantage over the shorter guys, so you can't play. So at that point, we're just picking and choosing what genetic advantages we think we have. And the reality is that like hormones do a lot of things, but like I said, they're not magic. They're not going to magically, you're not going to, and it's always, always about trans women. It's never, they forget trans men exist. But it's always, like so a trans woman is not going to be, is*

not going to be magically biologically better than someone who has always been female, in every sport. That's just not how it works." - 43 yo, White, Nonbinary/Transgender man/Transmasculine

Participants noted a striking contradiction: while anti-trans politicians and individuals often claim that trans people are "confused" about their sex/gender, it is actually many cisgender people who offer incomplete, inaccurate, and inconsistent definitions of sex/gender. As mentioned above, anti-trans rhetoric frequently appeals to so-called "biological reality" to justify discriminatory policies. However, there is no universally agreed-upon definition of what constitutes biological reality. Depending on the argument they wish to make, people may define sex/gender based on secondary sex characteristics, reproductive capacity, external genitalia, assigned sex at birth, or hormone production. These shifting definitions create challenges for trans people who are simply trying to live their lives. For example, participants shared how anti-trans expectations—such as requiring individuals to use bathrooms based on their sex assigned at birth and their genitalia—often fail to align with the realities of lived experience:

"I'm a about-to-be felon flaunting the law. When I wander around Florida, I don't use men's bathrooms. I use women's bathrooms. And if someone were to say to me, 'You're a guy, I'm going to turn you to the police,' I'd say, 'Please do.' I'll show them my bottom. You tell me what I am. But I've never had any problem. But again, I look like a girl. When I walk in there, no one looks at me and scratches their head and is suspicious." - 73 yo, White, Transgender woman

Notably, while the use of biology in public policy may be targeted at trans individuals, it has repercussions beyond trans communities. Some participants said while they have not seen genetics discussed in relation to trans people, they often seen genetics used in anti-trans policy to "carve-out" exceptions for unnecessary surgeries for intersex youth. They were concerned that intersex people would bear the brunt of transphobia, as they have historically.

"There's like a ton of anti-trans legislation about trans healthcare. And there's already like weird carve-outs about genetics in some of those bills, because almost all of them have a carve-out for intersex youth. So it says, 'Oh, trans youth can't have access to this healthcare, but intersex youth not only can have access to it, but can have it imposed on

them before they're old enough to give consent to this type of treatment.' And it's totally fine to do like, quote-unquote, normalizing surgeries on infants that are perfectly healthy just because their body doesn't fall into like a stereotype of what a body should look like. But of course, the second that a youth is old enough to say like 'Hey, I need gender-affirming care,' then it's not okay anymore." - 35 yo, White, Nonbinary/Transgender

Participants pointed out that cisgender people are also harmed by transphobia. When gender roles are policed–whether through public policy or societal norms–cisgender individuals who do not strictly conform to gendered expectations may also be targeted. When cisgender people are mistakenly assumed to be trans, they are subject to the same experiences of discrimination and violence. As one participant puts it, *"There's never a good accusation or a positive output to someone calling you trans. [It should be] another fact about them–yay! But it's always negative" (25 yo, White, Nonbinary)*. Several participants pointed to the example of Algerian boxer, Imane Khelif, who was accused of being transgender during the 2024 Summer Olympics. The accusation, which many saw as an attempt to disqualify her, undermined her hard-earned accomplishments. One participant used this example to illustrate how people outside of the trans community who came to Khelif's defense often fail to show similar solidarity when trans people are harmed by the same systems:

"Yeah, I mean, I think we all heard about the Algerian boxer. I think it's good that she's suing everybody. It's good that a lot of people came to her defense. I think it's fascinating that what got everybody talking about how unfair it was, was basically when a cisgender woman was attacked. Suddenly now it's an issue. She wasn't 7 ft. tall with an 8-ft. wingspan. She was just stronger than her opponents. That's allowed. That's literally the point of the Olympics.

But I think that a lot of [gender norms] end up punishing people who are not even trans. It just punishes people for being outside of the gender norms, even if they're cisgender. I mean, I remember hearing years ago about, a couple years ago about a 12-year-old girl in a track meet who got yelled at by somebody who was like, 'That's clearly a boy,' and a parent wanted a physical examination done of the kid. It was a whole lawsuit. This poor kid just wants to run track. We're just punishing her for being a non-gender conforming person. And that's really what it comes down to. 'Cause I mean, if you're passing as the gender you present as, no one's questioning you. No one's giving you a hard time. It's only when you don't fit perfectly into a box that suddenly now, now you're not allowed to

pee anywhere, and now you're not allowed to compete in any sports." - 43 yo, White, Nonbinary/Transgender man/Transmasculine

Speculation about Khelif's gender identity highlights another point raised by participants: definitions of what makes someone a "real" man or woman are shaped by racialized, Western gender roles. A few participants noted that strict adherence to these norms disproportionately harms people of color:

> *"They're just going by what y'all think women and men should look like, it's really gross. You really want that idea, that everyone needs to look the same and match up to some arbitrary description of man and woman. It's dangerous and racist. I'm thinking about Imane Khelif and the whole time they were like, 'She's transgender, the boxer in the Olympics.' No, North African women just look like this. This idea of everyone needs to look this way and these genitals are what makes a man and a woman are very White and very Western ideas. So the biological part just grosses me out. Also no room for like intersex people or anything like that, which is also frustrating, but like not surprising." - 29 yo, Black or African American, Nonbinary/Transmasculine*

Another participant, who is Pakistani and intersex, echoed this sentiment. They described how their gender presentation is often perceived as more masculine in the U.S. context simply because they are a person of color. They noted that people of color assigned female at birth are often expected to be more masculine compared to White individuals with the same assigned sex. They went on to share how their gender presentation has drawn negative reactions from those who seek rigid distinctions between men and women.

> *"I have a unibrow. I have a mustache. I have like armpit hair that's like this long. I have chest hair. I have hair on my stomach. You know? And to get into the question, I think like a lot of the time when you have certain characteristics–for me it was my hair that made people deeply uncomfortable–they don't respond to it well and then they want a reason as to why you are different than them. [...] It's more of a way to create a distinct line between man and woman. And people are coming to understand that there actually isn't really a strong line. And I think that that's scaring them." - 23 yo, Asian, Nonbinary/Transmasculine*

<u>Political Context for TIGR</u> - *"I feel like forcing it to be related to genetics feels like more threatening right now because of the way the world is. I mean, the fact that Texas is pulling lists of like people who have changed their gender, why? What exactly are you planning on doing with that? It can't be good." - 43 yo, White, Nonbinary/Transgender man*

Participants overwhelmingly agreed that TIGR could not be separated from the current political climate, especially given the growing wave of anti-trans rhetoric and policy. Many expressed concern that at this particular moment, when the stakes for trans people are so high, the potential harms of this research may outweigh its potential benefits. There was a strong sense that any search for a genetic basis for trans identity could inadvertently reinforce harmful narratives about trans people, including the harmful belief that they are "not real" men or women. If a genetic marker for trans identity were discovered, participants feared it could be used to identify, monitor, and target trans individuals in an increasingly hostile political environment. Participants pointed to current systems of surveillance, such as government tracking of gender marker changes on IDs or hospital data breaches, as evidence that identifying someone as trans is already risky. Several noted that historically, being identified as trans has often resulted in punishment, imprisonment, or state-sanctioned violence.

> *"I'm Jewish. So I'll just go straight to that historical context, which is if there's a marker for it and you can test for it then you can be selected at any stage of life. In my opinion we're in a fight of democracy versus fascism right now, and if fascism wins and then we have a genetic marker for things.. You know? Submit for your blood tests and then off you go. Right? So I think that there's a possibility for dangerous situations when something like a blood test can be an indicator. It's also dangerous when the test is 'Because I say so.' Right?*
>
> *You're too young to remember. But you probably know the history of–there were ordinances about how many articles of clothing you could have that did not align to your assigned sex at work. If you violated that, then they'd arrest you. That was one of the ways that they rounded people up at bars and speakeasys and carted them off to jail overnight was because a woman had on a necktie and a vest and those are both male." - 50 yo, White, Transgender Man*

Many participants linked TIGR to a broader history of using pseudoscience and genetics to justify harm against marginalized groups—including the enslavement, institutionalization, sterilization, and genocide of racialized and disabled populations. A few people mentioned that trans people could be targeted for genocide or sent to concentration camps, and believed that this

is the direction that conservative, anti-trans policy is moving towards. One participant pointed to how trans people were targeted and killed during the Holocaust as evidence. Several warned that anti-trans policies and rhetoric are increasingly aligned with eugenic thinking and could escalate toward mass violence.

> *"I think a lot of the bathroom bills and a lot of the anti-trans bills that are going around are part of that, part of eugenics, part of we do not want this population in public life or around. So we're going to try and legislate you out of existence. And we've seen that before with other groups of people. Black people, Indigenous people, anyone who the people in power in the U.S. was like, we don't want you here. We don't want to see you or we want your labor, but we don't want to have you as part of your society. So I really do feel like a lot of the anti-trans bills are also eugenicist in nature." - 29 yo, Black or African American, Nonbinary/Transmasculine*

Perhaps most concerning to participants was the belief that any research findings would be twisted by politicians and conservative media to support their own agendas. They emphasized that even well-intentioned or affirming data could be weaponized, particularly in an environment where many political leaders reject scientific consensus and manipulate facts to align with their ideologies.

> *"Depending on where you fall on your political views around trans people, [TIGR] will sway you. If you're one of those more indifferent, could care less about trans people and you think in very simple way and you don't think critically, there are some data that show you'll be like, 'Cool. Okay, I guess this is legitimate, like trans can't help themselves. This is not made up. They're not crazy. There's a biological reason.' So there might be more acceptance during this political climate or there could be people who believe that trans people are mentally ill, so they will say, 'See? This is why they're not normal, because there is a genetic reason. The gene was supposed to be expressed like this normally, but it didn't happen, and that's why they're weird or that's why they're that way. I think that same data could be interpreted and used differently, even if it's the same number or whatnot, by the people with a different agenda or beliefs." - 41 yo, Asian, Man*

Biological essentialism versus self-discovery

Disagreement within trans community - *"As soon as we say there is a biological marker for being trans then what happens if someone is having those feelings and they don't test for that biological marker, either because they don't have it or because the test is erroneous for some*

reason? Like are they suddenly now not valid as a trans person?" - 42 yo, White, Gender nonconforming/Transgender woman/Transfeminine

Complicating the issue further are disagreements within trans communities regarding who should have access to care and what the decision to seek care or not means for one's gender identity. This disagreement creates lines for who is "really" trans and who is not. When asked if they believed other trans people shared their opinions, most participants said "no," citing the wide range of perspectives, lived experiences, and political affiliations within trans communities. One participant described how "deep-seated, internalized transphobia" led some trans adults to support policies that limit their own autonomy. Another participant elaborated, explaining that some individuals view transness through a narrow lens:

> *"I think we forget that there are Republican trans people and trans people who love to lick boots and trans people who think that they are the only valid trans person ever and that the way they are trans is the only way to be trans. And folks forget that those people are included when we talk about the trans community and does the trans community agree? They don't agree. There's trans people for Trump out there. I've seen the signs. [...] I look at those things and I feel bad. I feel bad that somebody who wanted you to hate yourself got to you before you could find the love that exists in our community, you know? I'm so glad you're able to be you despite that hatred and despite that pressure. But that doesn't mean that other folks have to feel that hatred and pressure to be in community with you." - 28 yo, Asian, Man/Transgender man/Transmasculine*

Similarly, a few participants noted that trans individuals with binary gender identities may have more rigid views about what it means to be trans (though some of those expressing this opinion identified as binary themselves). Additionally, some participants pointed out that older transgender individuals may emphasize the importance of adhering to binary gender expectations and may promote the belief that there is a genetic reason for being trans (though this was not necessarily the view of all older individuals in our sample).

In general, two perspectives emerged during the interviews: 1) The only trans people who oppose this research are those who worry they might not have the genetic marker, and 2) TIGR promotes a medicalized view of trans identity, which is a naive approach to healthcare that

further gatekeeps access to care. Among participants who supported the first view, they argued that to be considered trans, you must experience gender dysphoria, which likely has a neurological basis. One participant worded this by saying, *"biological sex is as much in the brain as it is in the body" (73 yo, White, Transgender woman)*. They also pointed out that some trans individuals have known they were trans from a young age, even if they lacked the language to express it. This, they suggested, points to a natural or predetermined aspect of gender identity.

In contrast, other did not trust the instinct to have a "cut and dry" definition for trans identity. They believed that TIGR promotes a medicalized view of trans identity, such that if trans people have a biological marker for their gender identity, GAHC is the necessary next step to "treat" it. They believed this was a naive way of looking at the healthcare system and limitations trans people have to accessing healthcare. Some believed that having a genetic marker for trans identity wouldn't impact trans peoples' ability to access GAHC while others believed that it would only improve access for a subset of people. Among these participants, there was a sense that the need for validation of identity through TIGR was based on the "born in the wrong body narrative", which brought biology into conversations it shouldn't necessarily be in. There were also some discussions about whether or not someone needs GAHC to be considered trans. Some participants believed that defining trans-ness in relation to medical care leaves behind trans people who may not have access to GAHC for a variety of reasons–safety, geographical location, financial barriers, etc. For example, one participant describes how they currently live at home with their parents who don't know that they are trans. Although they would like to begin taking hormones, they are limited in their current situation:

> *"I'm 23 years old and I can't even access trans healthcare because I live with my parents. Transmedicalism is not fun for me because I can't access care. You know, hearing stuff like [you need to access GAHC to be really trans] from your own community, it's like,*

well, are you going to pay for my surgeries? Are you going to pay for my bills? No? Okay, then shut the fuck up." - 23 yo, Asian, Nonbinary/Transmasculine

Still, everyone agreed that everyone, regardless of gender identity, should have the autonomy to be able to explore and question their gender identity, coming to terms with it in their own way. Participants said that exploration and curiosity are natural human experiences, and people will go through their own personal processes on the way to self discovery. Some believed that essentialist explanations for gender were limiting in that they created black-and-white categories who is trans and who isn't, which restricted peoples' ability to self identify, changing their identity and expression over time. One participant elaborated on this, saying that trans people have always existed, and it is only now that that group of people is categorized that we are interested in finding a source for gender identity:

"I don't think that just because many people have the experience of this seeming like an immutable thing about themselves that they've known their whole lives means that there is a genetic component to it that it would be possible to isolate or manipulate or assess in somebody. I think some people are gay and some people are trans and some people are neither and it doesn't need to be this big thing of like, 'Well, why would people be that way?' People have always been like this, generally. We haven't always used certain language to refer to people. People haven't always known things about themselves. But these types of diversity of human experience have always been the case." -32, White, Man/Transgender man

<u>*Rights-based versus "Decolonized" Approach*</u> - "The pro-trans statements, you have to kind of trace it back to the biology and the anti-trans statements are more like hovering around it to begin with." - 25 yo, White, Genderfluid/Nonbinary

Another framework for understanding differences in opinion within the trans community was offered by one participant, who described it as "*a rights-based approach versus a decolonizing approach" (37 yo, White, Nonbinary/Transgender man/Transmasculine)*. The rights-based perspective views TIGR and the search for biological explanations of trans identity as potentially liberating. From this view, demonstrating that being trans has a genetic or biological basis could serve as evidence in support of trans rights by framing transness as an inherent, natural variation rather than a choice, and thereby protecting against discrimination.

Many participants acknowledged that this idea of genetic predetermination is compelling, especially for audiences such as religious groups that may otherwise reject trans identities. However, one participant argued that this is only a temporary solution:

> *"Historically, sometimes alignment with either nature or pathology has been a positive temporary way of approaching justice work. Always temporary, but frequently positive. So maybe there are people out there who are like, if we nail down this sort of natural biological conclusion of 'Your baby was always going to be trans because here's the marker that said that in their genes and you have to accept them because it's your genes that did it.' That could be positive and historical like parallels suggest that that is not the be all end all of justice." - 25 yo, White, Genderfluid/Nonbinary*

This same participant went on to say that they lean more toward the decolonizing perspective, which critiques the categorization of people as either cisgender or transgender as inherently harmful. They argued that this binary framing, as well as the gatekeeping that can happen within trans communities about who is "really" trans, reinforces essentialist ideas of biological difference that have long fueled discrimination. They also highlighted how anti-trans rhetoric often relies on a "rhetoric of naturalness," which is assumed to refer to biology. But, as they pointed out, naturalness doesn't have to be rooted in biology, but can also speak to innate tendencies or preferences for gender expression and exploration, that are not necessarily biologically predetermined.

<u>*There is Magic in Self Discovery*</u> - "I think it's really cool that I figured this out about myself. I did all the work to make me comfortable in my own body, and that took a lot of introspection. If it was something that I just inherited, [...] I feel like it almost takes the magic away." - 25 yo, White, Nonbinary/Transgender man/Transmasculine

Some participants felt that the idea of a genetic test to determine whether someone is trans conflicted with, or even undermined, the deeply personal journey of self-discovery they had undertaken. For them, understanding their gender identity required introspection, emotional work, and personal exploration—elements they considered central to their sense of self. They emphasized that being trans is not just a matter of biology, but also of experience, reflection, and

self-determination. One participant noted that even after coming out as trans, there are still decisions regarding your preferences for social and medical transition that can't be reduced to genetics. Another participant reflected on how identifying as a trans woman, rather than simply a woman, is a vital part of how she understands herself and her journey:

> *"Trans feminine, trans woman… I find that the woman part is important but I also find that the trans part is important. There are plenty of trans women who feel this way, that's great for them, I think there are plenty of trans women who just want to be identified as women who almost prefer to go stealth and not have their transness be a major part of their lives day to day. I don't feel comfortable that way. I want my transness to be out there. That is an important part of my identity–that not only have I arrived in this place but I came from somewhere else. And that sometimes I go back and visit there, you know? Both of those aspects are important to me. [...] The idea that I'm a finished product noun is tricky but if I have to pick one, it's usually trans woman. Some combination of, yes, I am aiming for femininity but also this is my agency and my choice and my journey. And so don't not call it trans 'cause it is and that's important." - 42 yo, White, Gender nonconforming/Transgender woman/Transfeminine*

For these participants, a genetic test indicating they were not trans would not change their life trajectories or their understanding of their identities. They expressed a deep sense of self-knowledge, emphasizing that their transness is not something they question whether it is valid or measurable. As they put it, trans people are "experts on themselves" and should be granted the autonomy to self-identify without needing medical or genetic "proof." In this sense, TIGR was seen as relatively unimportant. While it might have broader social or political implications, they did not believe it would meaningfully affect their own personal identities or experiences.

One participant expressed concern that future generations of trans youth would not have access to the resources they would need to help them to better understand their identity, given the current political environment. They believed that TIGR could further risk the process of self-discovery. Reflecting on their own experience, they discussed the magic they felt when finally being able to put language to their internal feelings:

"When combined with like the current political landscape where it's like, [anti-trans politicians are] obviously trying to eliminate "environmental cause for queerness" by policing kids' access to the internet and to people outside.. like, the kids don't go outside anymore. It's been wild to see they're all being tracked on their little life 360 devices by their parents, but they don't go anywhere. And so it's like, you can't see your friends in person, you can't see your friends online, you can't get access to information at the library anymore, because the kids don't know how to use encyclopedias.

And so it's like, where will they get the like organic access? I remember what it was like the day I saw the word transgender on Google. And I was like, 'oh my God, I have an understanding finally. There's a word for this feeling.' Where are they going to have that experience? I think in the context of that, the idea that folks might be simultaneously looking for a cause for transness screams like alarm bells to me." - 28 yo, Asian, Man/Transgender man/Transmasculine

Discussion

This work sought to understand how trans people perceive TIGR within the current political climate. Participants identified several potential benefits of this research, including personal validation, increased access to gender-affirming healthcare, improved public understanding of trans identities, and the possibility of providing "objective proof" that transness is real. At the same time, they expressed significant concerns, including pathologization of queer identities, reinforcing the harmful narrative that transness is a mental illness, promoting narrow definitions of what it means to be trans, and contributing to political violence against trans communities. The themes identified in my analysis (TIGR walks a tightrope of validating or vilifying trans identity, Policy using biology and genetics to define gender harms everyone, and Biological essentialism versus self-discovery) could also be understood as responses to foundational questions about trans rights at different levels. At the population or community level: Is transness "real" or "valid"? At the policy level: How do we define what it means to be a "real" man or woman? And at the individual level: What makes someone "really" trans? I do not pose these questions here to invalidate anybody's individual identity or experience, but rather to

call attention to the complexities that TIGR brings into focus, and that genetic researchers who wish to study gender identity should thoughtfully consider before beginning their research. While some people were excited by this research and eager to learn more, most felt it would likely have little impact on their day-to-day lives or their personal perception of their own gender identity and believed it was precariously situated within systems that have historically marginalized and harmed trans people. Based on these findings, it seems that TIGR is walking a tight rope. On one side, there are meaningful benefits and on the other, risk of serious harms. However, it feels as though no one is questioning the existence of the tightrope itself—including who built it or why it is there in the first place.

While previous studies have focused primarily on the political and social ramifications of discovering a genetic marker for trans identity, this research also explored a less frequently discussed but equally consequential possibility, that no genetic marker for trans identity is found. Some participants indicated that they would not be surprised by this outcome but still saw it as a frightening possibility. If research were to conclude that there is no genetic basis for trans identity, participants feared it could reinforce harmful narratives that claim trans people are "mentally ill" or "making it up." In today's volatile political environment, the fear of political harm if there is no genetic source for trans identity (i.e., trans people are "faking") and fear of discrimination if there is one, creates a lose-lose scenario in which anti-trans policymakers will use any information available to argue that trans-ness is an inherent biological or mental illness, not a lived identity.

This touches on another important finding of significant concern to the study sample–no matter what TIGR uncovers, participants worry that the research will be weaponized by anti-trans politicians and conservative media to further their own agendas. They highlighted that

scientific findings are not neutral once they enter a volatile political and social climate already saturated with anti-trans public discourse. In this political landscape, the motivation and intent of the researchers may matter less than how their findings are received, misinterpreted, or misconstrued by the public. This finding reflects a larger issue with how science is absorbed into public discourse. Even when the individual study itself is not inherently harmful, it is embedded in larger systems of power that shape our social realities. The "gay gene" can be used as an example of this. Although studies attempting to locate a single genetic basis for homosexuality have failed tests of replication and researchers involved with this work have publicly concluded there is "no gay gene" (rather, homosexuality is likely polygenic and multifaceted), the idea persists in public imagination as scientific "proof" of homosexuality.[18,19] Further, genetics is often equated with truth and objectivity, making the existence of a gay gene feel self-evident, even in the absence of methodologically sound scientific evidence. In this study, participants feared that findings would be stripped of nuance and appropriated to support whatever narrative suited the interpreter's agenda. It is crucial that researchers conducting TIGR anticipate the downstream uses of their work and the interpretation of their work by the broader public, not just its scientific validity.

Adding further nuance to this discussion, participants pointed out that societal notions of who qualifies as a "real" man or woman are shaped by racialized, Western gender norms. As a result, trans people of color are disproportionately impacted by transphobia, particularly when their bodies do not align with Eurocentric standards of beauty and gender expression, leading to heightened scrutiny and questioning of their gender presentation and identities. The public speculation around Imane Khelif during the 2024 Summer Olympics illustrates this dynamic, where her identity was publicly challenged not because of any confirmed "biological advantage",

but because she did not perfectly conform to Whitewashed ideals for womanhood.[20] This example underscores the reality that so-called biological indicators of sex and gender are themselves culturally constructed, not objective reality. Drawing from Nancy Krieger's ecosocial theory of disease distribution,[21,22] history is an important context for understanding the social divisions created in the past, and how they are reflected in current public health issues; in this case male/female, woman/man, transgender/cisgender, Person of Color/White. With this in mind, future research on trans identity and genetics should take an intersectional approach that recognizes how enforcement of gender norms and biological essentialism have disproportionately harmed trans people of color both in relation to their gender identity and their perceived race.[23]

Several participants described two contrasting frameworks for approaching TIGR. The first was a rights-based approach, which argues that identifying a genetic or biological basis to trans identity could be leveraged politically to protect trans people from discrimination. The second, a decolonialized approach, critiques binary categorizations of sex, gender, and other aspects of identity (and the structures that uphold them) as inherently harmful. This view challenges the assumption that because transness is "natural" is must be rooted in biology, arguing instead that biology itself is a construct shaped by colonial, Western scientific paradigms. In their commentary '*Queering Genomics: How Cisnormativity Undermines Genomic Science*,' Jamal et al. argue that integrating more nuanced understandings of sex and gender into genomics research can produce more accurate and inclusive understandings of human diversity.[24] Generally, stepping away from positivist approaches to genetics research, which credit researchers and their methodologies as purely objective and prioritize binary

classifications,[25] will result in the production of better science with more accurately reflects the complexity of human identity.

Lastly, many participants shared that while TIGR might offer personal validation for themselves or for other trans people, the primary reason they would support its continuation is the hope that it might silence skeptics and naysayers. Throughout these discussions, it became clear that although participants recognized potential benefits to TIGR, they viewed it as secondary to more pressing needs within trans communities. Above all, focus should remain on addressing the pervasive violence and discrimination trans people face in their day to day lives. If TIGR can serve as a tool in that broader struggle, participants welcomed it, but not at the expense of more immediate and material forms of support and protection.

This research was successful in several aspects, specifically in regard to its novelty and in recruiting a diverse, national sample of trans adults (over 50% of whom were people of color). This diversity, across race and other axes of identity, significantly enriched the depth and complexity of the data collected. However, this study is not without its limitations. Data collection occurred prior to the 2024 U.S. election; since early 2025, the anti-trans political climate has intensified significantly, and it is likely that individual perspectives have shifted in response. It is also important to acknowledge that the research was shaped by the perspectives and positionalities of the study team. Lastly, the research questions were defined a priori, rather than emerging inductively from the data, which may have constrained the ways participants' insights were interpreted or emphasized.

Although TIGR has the potential to benefit trans communities through personal validation and a greater public understanding of trans identities, it does not come without its risks. Fear of political harm if there is no genetic source for trans identity (i.e., trans people are

"faking") and fear of discrimination if there is one, creates a lose-lose scenario in which anti-trans policymakers will use any information available to argue that trans-ness is an inherent biological or mental illness, not a lived identity. Additionally, participants expressed concerns that biological essentialism limits trans peoples' autonomy and ability to self-identify. They also highlighted the point that scientific inquiries into the origins of gender identity are themselves shaped by cultural and political values and must not be removed from this context. My findings underscore the imperative that researchers understand the complexity and implications of TIGR in the context of the current political climate.

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Chapter 5

Summary of Findings

The overarching goal of this work was to characterize how a history of eugenic political and social practices has led to present-day biological essentialism, which is increasingly weaponized against trans people in public policy. Across three papers, I have demonstrated the ways in which contemporary policy employs biological essentialism and medicalization to advance eugenic strategies and harm trans communities.

In Chapter 2, I conducted a critical policy discourse analysis exploring the master discourses of medicalization, biological essentialism, and eugenics in state-level U.S. policies for legal gender marker changes on identification documents. I found that the majority of states, regardless of how progressive their policies may appear, still require medical procedures and provider verification to amend legal gender markers. Only a couple of states acknowledged the burdens these requirements place on trans individuals, including the potential impact on their future fertility. Although the policies are not explicitly mandating sterilization, as seen in some European countries,[1,2] in practice they have the same outcome. Trans activists are calling for self-identification of gender identity on legal documents (or the removal of gender markers altogether) as a step away from pathologization of trans identities.

In Chapter 3, I used structural equation modeling to develop a test two hypothesized models mapping political, community, institutional, and social level factors to trans individuals' parental desire. A high proportion of the study population reported that they would like to have children in the future or were currently in the process of becoming a parent. I found that healthcare avoidance mediated the relationship between policy awareness and parental desire. These findings underscore the need to address structural barriers to care—even in politically

"protective" environments—and affirm that achieving health equity for trans populations will require multi-level interventions across political, social, and institutional domains.

Chapter 4 explored trans individuals' perspective of trans identity genomics research (TIGR) within the current political environment through in-depth, qualitative interviews. Findings were organized around three themes that answered the questions: (1) Is transness seen as "valid" by the general population? (2) How do biology and genetics define conceptions of "real" women/men, and how does this impact trans people? and (3) What counts as "really" trans? While some participants viewed TIGR as potentially validating and a step toward greater public understanding, many also feared its potential for political misuse and further pathologization. To move beyond essentialist frameworks in genetics research, gender must be understood as existing on a continuum, shaped by cultural and societal contexts. Researchers must be explicit about the potential social and political implications of their work and approach it responsibly.

Personal Reflections

As I've been piecing together my dissertation, I've encountered some skepticism about its relevance to the field of Public Health Genetics. Recently, I attended a lecture by a historian of science who shared her experience as a graduate student in physics. She recalled questioning the foundations of her field, why things were done a certain way, and being told by her advisor, "Those aren't physics questions." Her response stuck with me: "To me, they are."

Although my dissertation does not involve analyzing genetic data or evaluating the direct clinical implementation of genetic technologies, I see it as critically important to our broader understanding of genetics in society. This work is about how genetics is interpreted, used, and

sometimes weaponized by people who often lack scientific understanding. I also think of the role behavioral genetics and the misrepresentation of science has played in acts of violence against marginalized groups of people.[3] Scientists, genetic researchers particularly, often separate the social implications from their work and refuse to critically engage with the histories of the communities that they want to work with. The current anti-trans political environment must not be separated from a history of eugenic practices that have harmed trans individuals for more than a century. Additionally, it is important that we both recognize and rectify with those histories.

Completing this research under the current political circumstances has been both personally and academically difficult, for a variety of reasons. One of the findings from Paper 3 was that trans individuals believed despite what science found, anti-trans politicians would twist any information possible to fit their narrative. Certainly, this is being proven to be true. Recently, there have been political pushes to restrict access to lifesaving, gender-affirming healthcare for trans youth (and trans adults) based on the argument that because hormone use is associated with reduced fertility, it is eugenic in nature.[4] However, this demonstrates a fundamental misunderstanding in what eugenics is and does. Eugenics is not solely about what medical treatments will impact someone's ability to have biological children; rather, it is institutional, political, and social power that is used to restrict an individuals' bodily autonomy and right to make informed decisions about their own medical care. Additionally, there are many medical procedures—pursued by cisgender and trans people—that result in reduced fertility and are not held to the same level of scrutiny. In fact, in the case of intersex youth these medical procedures are explicitly carved out of policies that restrict access to gender-affirming care. These policies are not in place to protect anyone from eugenic practices, but in fact promote eugenics through

restrictions to bodily autonomy and through defining social hierarchies in line with the ideals of the ruling sociopolitical class.[5]

Defining and labeling passive eugenics has assisted in the expansion of how we think about eugenics in the context of modern society. It draws attention to health equity issues and social, institutional, and political barriers to healthcare for historically marginalized populations. Naming practices as eugenics like the ones outlined in my dissertation draws attention to the facts that eugenics is about placing subjective value on one's life over another. Additionally, it highlights that eugenics is not a forgotten thing of the past, but very much a present reality for marginalized communities.

Conclusion

My dissertation demonstrates how biological essentialism, medicalization, and eugenics are foundational in a history of oppression for trans communities. It also illustrates how these three master discourses continue to shape and constrain trans people's rights to bodily autonomy and self-determination today. Depathologization is central to achieving equity for trans people—not only in medicine and policy, but also in science. As genetics becomes an increasingly powerful tool in research and public understanding, it is critical that it not be used to reinforce rigid, binary understandings of gender or to legitimize trans identities only through biological proof. Instead, genetics must be approached with humility, accountability, and a commitment to resisting harm. Only then can it contribute to a future in which trans people are understood and affirmed not because of their biology, but because their identities are respected on their own terms.

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Vita

Emerson Dusic, MPH is a Ph.D. Candidate in Public Health Genetics at the University of Washington, where they have developed expertise as a mixed-methods researcher. They earned their Master of Public Health in 2021, contributing to an NIH-funded U01 study integrating genetic testing for hereditary cancer into primary care settings. Emerson's dissertation work explores the political implications of biological determinism for transgender and nonbinary (trans) populations. They are currently a Research Assistant on the Trans/Forming Genomics Study, which is developing actionable guidelines for genomics researchers working with trans communities. At the intersection of bioethics, policy, and implementation science, Emerson's research advances health equity by centering accessibility and addressing structural barriers impacting historically and presently marginalized populations. In recognition of their contributions to research, Emerson was awarded the Wylie Burke Endowed Scholarship for Diversity and the Pamela E. Yee Award in Gender and Disability Studies. Beyond research, they are committed to advocacy and scientific education through mobilizing health professionals on policy issues, building interdisciplinary support networks for disabled and queer students, and delivering lectures on public health genetics, disability studies, and reproductive health. Emerson is currently seeking postdoctoral opportunities that will allow them to build on these experiences and continue producing community-informed, ethically grounded research.