



A Multilevel Investigation of Transgender and Nonbinary Adolescent and Young Adult Mental Health: Classification and Assessment of Structural and Interpersonal Determinants

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The undersigned, appointed by the
Department of Population Health Sciences,
have examined a dissertation, entitled,

**“A Multilevel Investigation of Transgender and Nonbinary Adolescent and Young Adult Mental
Health: Classification and Assessment of Structural and Interpersonal Determinants”**

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A Multilevel Investigation of Transgender and Nonbinary Adolescent and Young Adult Mental
Health: Classification and Assessment of Structural and Interpersonal Determinants

A Dissertation Presented By
Even Paglisotti

to

The Department of Population Health Sciences
The Graduate School of Arts and Sciences

In Partial Fulfillment of the Requirements

For the Degree of
Doctor of Philosophy
in the subject of
Population Health Sciences

Harvard University
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05 May 2025

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A Multilevel Investigation of Transgender and Nonbinary Adolescent and Young Adult Mental Health: Classification and Assessment of Structural and Interpersonal Determinants

Abstract

Mental health disparities, including depression and suicidality, among transgender and/or nonbinary (TNB) youth and college students are of high public health concern. Understanding the risk factors and population patterning of mental health disparities can shape intervention efforts at various levels to improve the mental health of TNB individuals. Caregivers of TNB youth have the ability to provide emotional support and access resources that are key to reducing disparities in TNB mental health. Colleges too have the ability to provide unique forms of institutional support to TNB students to facilitate reductions in mental health outcomes. Despite this, little is known about caregiver experiences of parenting TNB youth, the policy environments experienced by TNB college students, or the intersectional disparities in TNB college student mental health outcomes. This dissertation explores these key risk factors and disparities with the goal of informing intervention development for TNB youth and college students.

The first study (Chapter 2) utilizes the social ecological model to contextualize experiences of 48 caregivers of TNB youth in semi-structured interviews using thematic analysis and immersion crystallization. Chapter 3 utilizes quantitative intersectional modeling to characterize the population patterning of mental health outcomes among US college students across intersections of gender identity, race/ethnicity, and socioeconomic status. Finally, Chapter

4 empirically classifies the distribution of 12 TNB-supportive policies across 311 US colleges using latent class analysis.

Among caregivers, we found opportunities for gender affirmation and social connections, stressors between youth and caregivers, and associations between caregiver labor and stress.

Among college students, we found first generation biracial Black and Indigenous TNB students had the poorest predicted mental health outcomes. Lastly, in examining college campus policy environments, we found associations between the probability of having a more supportive policy environment for TNB students and indicators of a college's access to resources.

This dissertation discusses opportunities and recommendations for intersectional interventions across levels of the social ecological model, especially interventions at the community, organizational, and societal levels.

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Chapter 1: Introduction

Transgender and/or nonbinary (TNB) youth and college students (those whose sex assigned at birth does not align with their gender identity) experience substantial mental health concerns relative to cisgender individuals (those whose sex assigned at birth aligns with their gender identity).¹⁻⁷ TNB youth and young adults are also a growing population⁸ whose mental health has been increasingly under threat in recent years due to rising policy-based attacks, including bans on access to life-saving gender affirming care, access to restrooms, showers, and locker rooms, and participation in school-based activities.⁹⁻¹¹ Given that these policy-based attacks have been associated with increased mental health concerns,^{12,13} addressing gaps in research on the distribution and determinants of TNB youth and college student mental health is paramount to mitigating predicted rises in the prevalence of TNB mental health outcomes.

Theoretical Frameworks

Efforts to better understand and support the experiences of TNB youth and college students have been motivated by multiple theories. This research draws on the Gender Minority Stress Model, the Social Ecological Model, an Intersectional Framework, and Ecosocial Theory.

Gender Minority Stress Model

The Minority Stress Model and the related Gender Minority Stress Model theorize that stigma associated with being TNB causes mental health inequities among TNB populations, and that stigma can manifest as external and internal stressors unique to TNB populations.¹⁴⁻¹⁶ External stressors include stressors at the structural and interpersonal levels. Structural stressors manifest as, for example, discriminatory cultural norms and policies, and are associated with greater risk of experiencing interpersonal and internal stressors as well.^{14,17} Interpersonal

stressors can include anti-TNB harassment (e.g., misgendering), hate crimes, familial rejection, or failing to accept a TNB youth's gender identity. External stressors drive internal stressors, which can manifest as internalized transphobia, rejection sensitivity, and concealment of one's gender identity. These stressors can also result in psychological distress directly, or indirectly. For example, because of increased employment discrimination, TNB individuals are more likely to experience poverty, homelessness, and overall report a lower socioeconomic status (SES), which is associated with increased mental health concerns.¹⁸⁻²⁰ Experiencing employment discrimination can also be psychologically distressing in itself.²¹

Social Ecological Model

The social ecological model is a framework often utilized in health promotion and preventative research, which encourages examining determinants of health and intervention targets at various levels.²²⁻²⁴ These levels include the individual, interpersonal, community, organizational, and societal levels. The individual level focuses on the emotions and behaviors of individuals. The interpersonal focuses on how relationships with family members and friends impact individuals, including how parental support can positively impact TNB youth.²⁵ At the community level, the social ecological model focuses on relationships within schools, religious communities, neighborhoods, etc., which can provide social support or promote isolation for TNB youth and college students. For example, TNB youth can receive social support through schools, religious communities and other local community organizations, or online peer support groups²⁶⁻³⁰ At the organizational level, institutions (e.g., school systems, health insurance companies, and medical systems) have policies that can either facilitate or create barriers to supporting the mental health of TNB youth and college students. For example, a school district

or college may or may not have a policy that affirms the rights of a TNB student to use their chosen name and pronouns at school.³¹ Lastly, the societal level of the ecological model includes societal attitudes and ideologies, as well as local, state, and national policies, including discriminatory, anti-TNB legislation.³²

Intersectional Framework

Originating from in Black feminist scholarship,^{33,34} an intersectional framework provides tools with which to address heterogeneity in TNB mental health within TNB populations.³⁵⁻³⁷ Comprised of six core ideas, (social inequality, power, relationality, social context, complexity, and social justice), an intersectionality framework encourages researchers in public health to employ multilevel, multidisciplinary, and diverse methodological approaches to examining health disparities among multiply marginalized populations.³⁸ Specifically, an intersectional framework describes the ways in which individual' social positions (e.g., gender, race/ethnicity, and SES) shape their interactions with different forms of oppression and subsequently influence their health.^{35,36,38-41} Intersectionality has been identified as a “key lens” for researching health inequities, specifically among TNB populations.^{42,43}

Ecosocial Theory

Ecosocial Theory is a social epidemiologic theory that provides critical insights for examining the impacts of policies on TNB individuals. According to ecosocial theory, disease distribution is in part conditional on not simply one policy, but on a political environment that exists within social-ecological levels.⁴⁴ A policy environment is shaped by a collection of policies and related contextual factors. In the context of colleges in particular, examining presence or absence of all policies impacting TNB students, as well as the institutional context in

which those policies are implemented is critical to understanding the TNB-supportive policy environment and its impact on TNB student mental health.

Using these theories, this research seeks to fill critical gaps in the literature regarding determinants of TNB youth and young adult mental health. Chapter 2 utilizes a social ecological approach to contextualizing the experiences of caregivers of TNB youth. Chapter 3 employs multilevel quantitative intersectional modeling to characterize the patterning of mental health outcomes across intersections of gender identity, race/ethnicity, and socioeconomic status in a large, national study of US college students. Chapter 4 draws on policy data collected across 311 US colleges to empirically classify different environments of institutional-level support for TNB college students. Collectively, this research extends our foundational understanding of determinants of TNB youth and young adults using novel applications of theory and social epidemiologic methods and practice.

Chapter 2: “I Don’t Think It’s a Phase”: Caregiver Experiences Supporting Transgender and/or Non-Binary Youth

Introduction

Transgender and/or nonbinary (TNB) youth, those whose gender identity differs from the sex they were assigned at birth, make up as much as 9.2% of adolescents in the US according to population-based samples⁴⁵ and experience higher risk for myriad mental health conditions and risk behaviors compared to cisgender peers.^{3,46-49} These disparities are associated with stigma and stressors targeting TNB people,^{16,50,51} such as greater risk of experiencing discrimination, bullying, and violence victimization in school and family settings.^{46-48,52} Family members may use physical violence, force TNB youth out of their homes or into gender identity conversion programs, or refuse to provide access to life-saving gender-affirming care.^{50,52-56} These and other forms of family rejection and violence have been associated with poor mental health outcomes among TNB youth.^{48,56,57}

In contrast, gender affirmation and support from caregivers is associated with reduced mental health concerns among TNB youth.^{48,58,59} Greater family connectedness, family communication, and parental support of TNB youth’s gender identity and expression are connected with less self-harm, depressive symptoms, and suicidal ideation, as well as greater self-esteem, resiliency, and life satisfaction among TNB youth.^{48,50,60-64} Gender affirmation, such as using a TNB youth’s affirmed name and pronouns or helping youth access gender-affirming care when needed, is a critical component of caregiver support and is associated with improved mental health concerns and well-being among TNB youth.^{48,65-70}

Caregiver support can grant TNB youth access to multiple resources positively associated with mental health outcomes, including gender identity appearance congruence (perceiving one's physical appearance to match one's gender identity)⁷¹, sense of community⁷², and resources for improved family functioning.^{48,50} However, while caregiver behaviors are drivers of TNB youth mental health, research on caregiver experiences of parenting TNB youth is limited.⁷³ Additionally, few family-level or caregiver-specific interventions have been developed to assist caregivers in engaging in supportive behaviors for their TNB youth.⁷⁴ Given the substantial burden of mental health outcomes reported by TNB youth at this critical period of physiological and psychosocial development,⁷⁵ facilitating caregiver support of TNB youth should be a high priority for TNB population health. Further examining caregiver experiences of caring for TNB youth can support researchers in identifying targets for interventions to support the mental health and gender-affirming behaviors of caregivers, in turn, supporting the mental health of TNB youth.

Gender Minority Stress Model

The minority stress model and gender minority stress model offer an important theoretical lens through which to examine experiences of caregivers of TNB youth. The minority stress model suggests that the discrimination and structural oppression experienced by minoritized individuals, including TNB youth, translates into tangible adverse impacts on health.^{15,72,76} Effects of gender minority stress on TNB youth may extend to impact their caregivers, regardless of a caregiver's gender identity.⁷⁷ The challenges of being a caregiver to a young person are already manifold, but caregivers of TNB youth must additionally cope with both the reality and fear of others' harmful reactions to TNB youth and those who support them, including interpersonal and structural discrimination, rejection, and victimization.⁷⁸ Emerging

research on caregivers of TNB youth has shown that caregivers often experience mental health symptoms of anxiety, stress and depression due to concerns about their child's gender identity development and potential resulting discrimination.⁷⁹ However, experiences of caregivers of TNB youth remain understudied, especially those of cisgender men caregivers, who have been underrepresented in research, and whose rejection has been highly associated with poor mental health outcomes among TNB youth.^{57,73} Further research is needed to document and contextualize caregiver experiences of parenting TNB youth for clinicians and interventionist to better support the mental health of both caregivers and TNB youth.

Social Ecological Model

The social ecological model is a useful and widely used framework for health promotion and prevention of negative health outcomes.²²⁻²⁴ This model has previously been used in TNB youth health to organize the results of a systematic review of protective factors for TNB youth health disparities,⁸⁰ and to conceptualize family experiences from TNB youth's perspectives.⁸¹ However, no studies of caregivers of TNB youth have employed the social ecological model, which may provide insights to inform the creation and effectiveness of interventions for caregivers. Caregiver experiences of parenting TNB youth map onto multiple levels of the social ecological model, including the individual, interpersonal, community, organizational, and societal levels:

Individual. At the individual level of the social ecological model, which focuses on the emotions and behaviors of individuals, caregivers of TNB youth often struggle with complex emotions related to parenting a TNB child. These emotions can include mourning the loss of the future a caregiver had envisioned for their child in their socially assigned gender,⁸² worrying

about their child facing rejection or violence,⁸³ fears about the health of their child, and concerns about possible medical interventions.^{58,79} Experiencing challenging emotional responses to a TNB youth's gender by a caregiver may hinder the caregivers' ability to enact supportive behaviors, such as acknowledging and using a child's new pronouns and/or name.³⁰

Interpersonal. Within the interpersonal level, which explores how relationships with family members and friends impact individuals, Family Systems Theory posits that caregiver relationships with other family members impact youth-caregiver relationships and youth development.⁸⁴ For example, lack of understanding and support of a TNB youth's gender identity from a caregiver's current or former romantic partners can contribute to caregiver stress and anxiety,⁸⁵ which may transfer to the TNB youth. Disagreements between caregivers and extended family members about a TNB youth's social, legal, or medical transition may impact the degree or type of support that one or multiple caregivers are able to provide.³⁰

Community. The community level focuses on relationships within communities and institutions (e.g., schools, religious communities). Relationships within communities and institutions can provide social support or prevent isolation for caregivers and TNB youth and connect caregivers with other resources. Social support can be received through schools, religious communities and other local community organizations, or through online peer support groups.²⁶⁻³⁰ Caregivers of TNB youth have also previously described how much education is often required for them to adequately support their youth.³⁰ Peer support groups for caregivers can help caregivers access information through locating vetted educational resources.

Organizational. The organizational level focuses on policies within organizations and social institutions (e.g., school systems, religious organizations, health insurance companies, and

medical systems). Policies within organizations and social institutions can either facilitate or hinder caregiver's support of TNB youth. For example, while a caregiver may use their TNB youth's affirmed name and pronouns, a healthcare setting may not have a policy that instructs their staff to do the same, resulting in the TNB youth experiencing harmful microaggressions.⁸⁶ When institutions have limited supportive policies, caregivers may experience stress from taking on the role of advocate for their child, such as at school and/or when seeking gender-affirming care.^{58,83} Prior research indicates that emotions such as worry, fear, and confusion may be in part a response to the challenges caregivers face in accessing services and obtaining resources for their TNB children rather than a response to the TNB youth's gender identity.^{29,87}

Societal. The societal level of the ecological model includes local, state, and national policies. Intersecting forms of societal-level discrimination may differentially impact caregivers of TNB youth. For example, caregivers with low socioeconomic status may experience increased difficulty finding affordable gender-affirming healthcare for TNB youth, which can often be denied by insurance carriers.⁸⁸ The societal level also includes the attitudes and ideologies of the current culture. Caregivers may struggle with supportive behaviors when holding attitudes and beliefs related to gender normativity and sex essentialism.^{28,89}

Societal-level attitudes and ideologies are also influenced by current and proposed policies and political campaigns.⁹⁰ At the time of data collection for this study, anti-TNB policies and political rhetoric in the US was increasing, causing substantial fear among many families of TNB youth.^{91,92} At present, in 2025, political discrimination against TNB youth and adults has become widespread in the US and other countries.⁹³ This discrimination includes threats to remove TNB children from the homes of caregivers who support their youth's medical and social

transition by classifying supportive behaviors as child abuse,^{91,94-96} placing substantial stress on caregivers of TNB youth, as well as on youth themselves.

The Current Study

While studies show that caregivers' experiences of parenting TNB youth can be organized across all social ecological levels, this research remains limited. Additionally, prior studies rarely include substantial numbers of cisgender men caregivers. Informed by the social ecological model, this study sought to expand the limited literature on the experiences of caregivers of TNB youth of multiple genders by 1) identifying and contextualizing caregiver experiences of parenting TNB youth across social ecological levels, and 2) identifying facilitators of and barriers to caregivers' supportive behaviors and healthy family relationships across social ecological levels. In doing so we aimed to improve the knowledge base of advocates, researchers, interventionists, and clinicians working with families of TNB youth.

Methods

Forty-eight caregivers of TNB youth from 33 families participated in Wave 1 interviews of the Trans Teen and Family Narratives Project⁵⁰, a longitudinal community-based study. Caregivers included mothers (n=29), fathers (n=16), grandmothers (n=2), and one great-grandmother (n=1). Of 33 families, 15 had two participating caregivers. Most caregivers were White (n=44) and had completed a college degree or higher (n=42; Table 2.1). All caregivers were cisgender. Eligible caregivers lived in New England at the time of study enrollment, were age 18 years or older, and had a participating youth, age 13-17 years, whose gender was different from their assigned sex at birth. Youth enrolled in the original study (n=33) were 52% transmasculine, 36% transfeminine, 12% nonbinary. Participants were recruited through

organizations in the New England region of the US serving TNB youth and families, such as youth drop-in centers; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) organizations; homeless shelters; medical and mental health providers; and gender clinics.⁵⁰

Table 2.1. Caregiver Demographics

Characteristic	All (n=48)	Female (n=32)	Male (n=16)
Age Range			
35-50 years	28	22	6
51-65 years	19	9	10
66-75 years	1	1	-
Language			
English	48	32	16
German	2	1	1
Chinese	1	-	1
Portuguese	1	1	-
Spanish	1	1	-
Race/Ethnicity*			
White*	45	30	15
Hispanic or Latinx	2	1	1
American Indian or Alaskan Native	2	1	1
Partner Status			
Single	3	2	1
In a relationship	2	2	-
Married (living together)	37	22	15
Married (living apart)	2	2	-
Divorced	2	2	-
Widowed	2	2	-
Educational Attainment			
Did not complete high school	1	1	-
High school diploma/GED	5	3	2
Associate's degree	7	6	1
Bachelor's degree	16	11	5
Master's degree	11	8	3
Doctoral or professional degree	8	3	5
Annual Individual Income			
\$0-20,000	8	7	1
\$20,001-40,000	4	4	-
\$40,001-60,000	9	6	3
\$60,001-80,000	8	5	3
\$80,001-100,000	4	4	-
\$100,001 or higher	13	5	8

Table 2.1 Note: *Answer choices do not sum to the total (n=48) because answer choices are not mutually exclusive.

Positionality

Authors have diverse identities, training, and life experiences that may have influenced the analysis, findings and interpretation of this study. Team members' gender identities included cisgender woman, transgender man, and nonbinary; sexual orientation identities included queer, lesbian, gay, bisexual, and heterosexual. Authors' races and ethnicities included Black, White, Indigenous, Middle Eastern and Latinx. Authors received training from multiple fields, including developmental psychology, clinical psychology, education, gender and women's studies, social epidemiology, social and behavioral sciences, social work, public health, and community health sciences. All authors had previously conducted research with TNB youth and families and/or had lived experience as a TNB person. During the analysis and manuscript writing process, the authorship team regularly discussed their positionality, including relevant biases and assumptions as they arose, and how their positionality may influence or inform the analysis and interpretation of results.⁹⁷

Data Collection

As per community-based participatory research principles,⁹⁸ community members representing multiple groups of stakeholders were involved in various stages of the original study, including study design, recruitment, development of study materials, and interpretation of results.⁹⁹ The current analysis utilized Wave 1 caregiver interview data, collected December 2015 to July 2016. Semi-structured interviews with each caregiver occurred either in a private room at the researcher team's office space or at the family's home and averaged 45 minutes in length. Some interviews were conducted via secure video conference due to geographic distance. Interviewers obtained written informed consent from study participants prior to starting each interview and participants received a \$20 gift card at the end of the interview. Interviewers were trained to use a comprehensive safety plan in case of disclosures of depression, self-harm,

suicidality, and/or child maltreatment. All seven interviewers identified as LGBTQ+ or allies. All study procedures were approved by the Boston Children's Hospital Institutional Review Board. These data are unavailable to other researchers due to the possibility of identifying participants in the small population of TNB youth and their families in New England.

Interview Protocol

Interview questions focused on family structure, gender identity of family members, family functioning in relation to the TNB youth's gender identity, stress and coping mechanisms, and the role of support and community engagement in the family. The interview protocol was informed by the social ecological model.²⁴ Examples of interview questions included, "Do you remember how you felt or how you acted when [TRANS TEEN] first told you about their gender identity?" (individual level), "How have relationships with people in your immediate family changed because of your child's gender identity?" (interpersonal level), and "How have people outside of your immediate family responded to [TRANS TEEN]'s gender identity? How have other people's responses affected you? (community level)"

Analytic Methodology

Two qualitative analysis approaches were used to organize and analyze the data: immersion/crystallization and thematic analysis,^{100,101} both of which stress the importance of analysts immersing themselves in the data, writing memos to identify themes, and continuous refinement of these themes throughout analysis. Prior to the initiation of this analysis, the study team used immersion/crystallization and thematic analysis approaches to create and test a codebook with a subsample of four transcripts. After the codebook was refined by study staff, the final codebook was used to code all transcripts. Each transcript was coded independently by

analysts and any discrepancies in coding among the team were discussed and resolved during regular team meetings. More details on the development of the original codebook can be found elsewhere.⁸¹

For theme development, immersion/crystallization and thematic analysis approaches were used with biweekly review of emerging patterns, relevant quotes, and attention to potential assumptions and biases coming into the process from the analytic team. Following the reading of transcripts, sets of observed patterns were grouped into one set of themes. Codes from the original caregiver codebook were grouped into a second set of themes. The two sets of themes were then compared, identifying areas of commonality and contrast. During this comparison process, the subtheme of fear was identified as a concept that was not present in the original codebook and was thus incorporated into the list of potential themes. Through discussions, the two sets of themes were reconciled by the first author into one set of themes, with feedback from the analytic team in regular meetings.

Results

The study team identified five primary themes from the caregiver interviews, which mapped onto levels of the social ecological model: 1) Mental Health and Affect (of youth and caregivers, as reported by caregivers); 2) Interpersonal Factors, which described a) how a TNB youth's gender identity impacted caregivers' relationships inside and outside the family and b) how caregiver's relationships inside and outside the family impacted TNB youth in relation to their gender identity; 3) Support Needed, Given, and Received (for both TNB youth and caregivers, as reported by caregivers); 4) TNB community connections; and 5) societal factors, including the impacts of policies and societal norms (see Table 2.2 and Figure 2.1).

Table 2.2. Themes and Associated Codes

Theme	Theme Name	Description	Codes
Theme 1	Mental Health and Affect	Specific emotions (stress, happiness, and fear) and mental health issues and diagnoses (anxiety or depression, or suicidality and self-injury) among TNB youth and caregivers	Stress Coping Mechanisms Mental Health Concerns Happy
Theme 2	Interpersonal Factors	Impact of interpersonal interactions related to a TNB youth's gender identity on the TNB youth and family or close community reactions to a TNB youth's gender identity	
	Subtheme 1: Bidirectional Impacts of Communication	Impacts of communication related to a TNB youth's gender identity on TNB youth or other family members. Includes responses from others (within and outside of the family) to initial gender identity disclosure, and impacts of communication and responses to gender identity disclosure.	Relationships with family affecting gender identity Relationships with outsiders affecting gender identity Impact of family on youth's gender and transition Gender salience
	Subtheme 2: Bidirectional Impacts of Relationships	Ways in which relationships inside and outside the family shifted in connection with TNB youth's gender identity, as well as the impact of family relationships on TNB youth's gender identity and transition	Feelings about responses to gender identity Impact of responses to gender identity Initial responses to gender identity disclosure from family Current responses to gender identity disclosure from family Initial responses to gender identity disclosure from outsiders Current responses to gender identity disclosure from outsiders

Table 2.2 (Continued)

Theme 3	Support Needed, Given, and Received	Supportive actions of a caregiver towards their TNB youth or other TNB people, and support received and/or needed by the family/TNB youth in relation to the TNB youth's gender identity	<p>Resources</p> <p>Support found</p> <p>Support needed</p> <p>Support given</p> <p>Advocacy</p> <p>Research</p> <p>Perceptions of support</p>
Theme 4	Impacts of Community Connections	Connections between the family and TNB people outside of the family, as well as the TNB youth's connections to the wider community	<p>Experiences with trans community</p> <p>Experiences with “trans family” community</p> <p>Experiences with LGBT community related to their gender identity</p> <p>School community</p>
Theme 5	Societal and Organizational Factors	How the family interacted with societal and organizational factors such as policies and norms, including the impacts of rural and socioeconomic class-driven healthcare inequities in access to gender-affirming healthcare. Impacts of unsupportive work, school, and insurance policies, politics, and religious norms were often mentioned	<p>Transition</p> <p>Gender messages</p> <p>Medical transition</p> <p>Legal transition</p> <p>Impact of work on youth's transition</p> <p>Impact of school on youth's gender and transition</p> <p>Impact of insurance on transition</p> <p>Impact of finances on transition</p> <p>Mental health treatment</p> <p>Impact of religion on youth's transition</p>

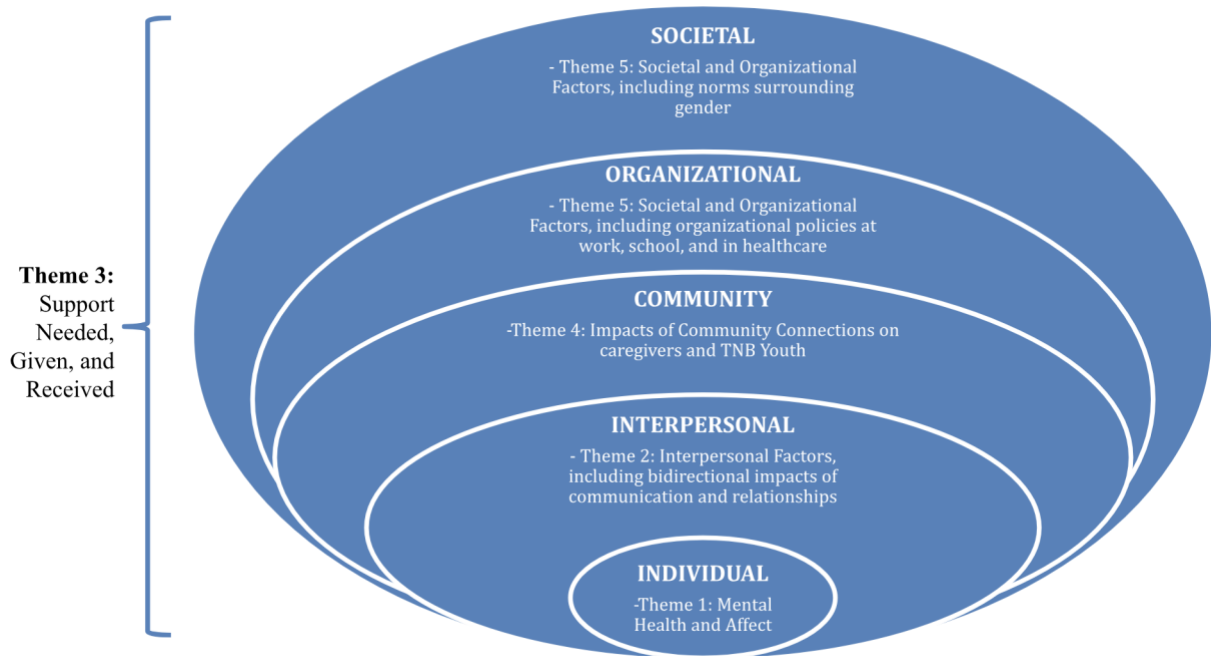


Figure 2.1: Themes Mapped to the Social Ecological Model

Theme 1: Mental Health and Affect

Mental Health and Affect included caregivers' mention of specific emotional states, mental health concerns, and mental health diagnoses among TNB youth and caregivers. Regarding affect, participants referenced fear, as well as stress and happiness; the latter two were included in specific questions in the interview guide. Caregivers expressed stress related to accepting their youth's gender identity, and actual or potential reactions of family members or caregivers' peers to their youth's gender identity. When asked about his relationship with his 17-year-old transgender son, one father described how stress had affected their relationship:

This whole evolution of gender...it's made me more sensitive or more on edge....[I]t's had an effect that causes me to be passive-aggressive....A lot of times, I'm stressed basically, and that stress comes out in all different ways...with [TNB YOUTH] and I, I think our relationship or interactions are more charged....I'm not happy with probably the transgender thing at that point, and so it comes out in negative ways. But that is getting better.

Discussions of mental health included mentions of diagnoses or symptoms of anxiety, depression, suicidality, and self-harm. While these often occurred in reference to the TNB youth's mental health, caregivers sometimes referenced their own mental health. Caregivers also expressed concerns about potential future mental health outcomes for their TNB youth or for TNB youth more broadly. One father of a 14-year old transgender boy shared his reflections after interacting with parents who do not have a transgender and/or nonbinary child:

They say, "...You guys are such great parents...." I'm just going, "What makes us great parents?"... I can't believe that a parent who supposedly loves their child would risk self-harm or suicide just because they can't deal, you know, they can't get over themselves.

In addition to sharing concerns around the mental health of TNB youth, this participant expressed assumptions about the emotions of caregivers of TNB youth who are less supportive of their TNB youth's gender and/or mental health. For example, this participant appeared to

assume that parents/caregivers of TNB youth who do not support their TNB youth in affirming their gender identity might not love their TNB youth.

Theme 2: Interpersonal Factors

Theme 2 described the impacts of interpersonal interactions related to a TNB youth's gender identity on the TNB youth, family, or community members. Two subthemes were identified within this theme: a) bidirectional impacts of communication and b) bidirectional impacts of relationships.

Bidirectional impacts of communication. This subtheme described how communication related to a TNB youth's gender identity impacted the TNB youth and/or other family members. This theme included reactions from others – both within and outside the family – to initial gender identity disclosure and the impacts of those responses. Caregivers often disclosed their TNB youth's gender identity to those outside the nuclear family on their youth's behalf. Many caregivers described family members' initial responses to their TNB youth's gender identity as mostly gender-affirming, though unsupportive responses were also commonly described.

Unsupportive responses ranged from family members not using the correct name or pronouns for the TNB youth to estrangement from extended family members following an initial negative reaction. Of those who described family members' initial reactions as positive, caregivers referenced these positive reactions as expected. Caregivers commonly described family members' current reactions to their TNB youth's gender as more positive compared to the family members' initial response. One father of a 15-year-old transgender boy discussed his sister's change in response to her nephew's gender identity:

And she had a hard time changing the way she was thinking, because she knew [TNB YOUTH]...she knew [TNB YOUTH'S ASSIGNED NAME] for 10 years....And she was trying to...hoping that [TNB YOUTH] could get some kind of a [gender-]neutral name. That was her way of trying to get her mind around it. But that was probably the first maybe few months. And now my sister [SISTER] has come around full circle to just forget about that idea. She isn't saying anything negative.

Outside of the family, caregivers described negative reactions to their TNB youth's gender identity as often coming from a youth's peers, adults at the youth's school, neighbors, and the caregiver's friends or coworkers. When asked about the reactions of people outside of the family to learning of her child's gender identity, the mother of a 15-year-old transgender boy described her neighbor's reaction and how it has affected her relationship with that person:

I mean the lady across the street every once in a while she's like, "I think it's a phase." I'm like, "I don't think it's a phase. He's on testosterone almost a year, not a phase."...every once in a while she'll say something stupid and I'm like, "All right, have a good day. No, he's still [TNB YOUTH]." ...she's still a friend, but she's not one of my inner circle....

Caregivers noted not only their own feelings and reactions to disclosure-related responses, but also the feelings and reactions of their TNB youth. When caregivers discussed positive interactions with others regarding their TNB youth's gender identity, caregivers often described a time where they, as caregivers, disclosed their TNB youths' gender to third person and the third person reacted well. In comparison, when caregivers described negative interactions regarding their youth's gender identity, examples tended to describe the negative impacts of the interaction on the TNB youth. For example, one mother of a 16-year-old nonbinary youth shared her youth's response when she referred to them using incorrect pronouns:

I used the wrong pronoun because I had called...I can't remember who I was on the phone with, whether it was the hospital or whether it was the suicide hotline and they [TNB YOUTH] had called them. I can't remember exactly how it came about that I was on the phone with a person and I used the wrong pronoun and then [TNB YOUTH] was just screaming and really, really mad.

A grandmother of a 14-year-old transgender boy shared her perception that her grandson's experiences with mental health care before and after gender identity disclosure were directly connected to his great-grandmother's negative response to disclosure:

He's had a total of six psychiatric hospitalizations, seven, but he had five before coming out. Since he came out, he's had two. One was a month after coming out and I know a lot of it had to do with the fact that my mother would not accept it.

Bidirectional impacts on relationships. This subtheme described the ways in which relationships inside and outside the family shifted in connection with the TNB youth's gender identity. It also described the impact of family relationships on a TNB youth's gender expression and transition. Most mentions of the impact of a TNB youth's gender identity on relationships were within the context of the immediate or extended family. Caregivers described both affirming and unsupportive behaviors. Unsupportive behaviors usually involved another family member's lack of understanding or discomfort with the TNB youth's gender identity. For example, in response to a question about relationship shifts in the immediate family following gender identity disclosure, the mother of a 13-year-old transgender boy shared:

My sister felt like [TNB YOUTH] could change his mind, for the first couple of years. So, I knew she felt that way. She would bring me or hand me down clothes from my nieces like, "Just in case he changes his mind." It's like, "It's not going to happen." But I'd take the clothes and I wouldn't have a conversation. But it just kind of let me know that she didn't fully understand yet, so that makes me feel tentative about our relationship.

Positive impacts usually involved a caregiver or another adult supporting the TNB youth, sometimes with resultant growth in the relationship. The mother of a 15-year-old transgender boy explained how her relationship with her son has grown stronger:

I feel like he can talk about some things with me that not necessarily all of my friends would say their kids are talking to them about. So I think our relationship has grown stronger with my support of his gender identity.

Theme 3: Support Needed, Given, and Received

Theme 3 described supportive actions of a caregiver towards their TNB youth or other TNB people, and support needed and/or received by the family or TNB youth in relation to the TNB youth's gender identity. Caregivers considered themselves or others to be supportive if a person was perceived to have a gender-affirming mentality and/or engaged in gender-affirming behaviors. They often described a family member as "supportive" even after disclosing that the same family member did not engage in gender-affirming behaviors. For example, when asked about challenges she experienced in relation to her son's gender identity, the mother of a 13-year-old transgender boy shared this experience of disclosing her son's gender identity to family she described as "conservative":

My parents I told on the phone, so they've known since I guess a couple months now. My mom just cries every day, and they actually have been outwardly supportive and told us they don't know if they can change pronouns, but they have agreed to stop calling [TNB YOUTH] [ASSIGNED NAME], which is his birth name.

Regarding support needed, caregivers highlighted the importance of connecting with other caregivers of TNB youth and connecting their TNB child with other TNB youth. Caregivers discussed barriers to support, including difficulty finding resources or knowledgeable providers, geographic distance from care providers or support groups, and lack of time and money for gender-affirming medical treatment. When asked about the type of support she needed, the mother of a 15-year-old transgender girl shared about her desire to connect with a group of other caregivers of TNB youth:

...it's hard to talk to friends and family about this, because they know [TNB YOUTH]. So it would definitely be great to have a group of people that you can contact about this kind of stuff. That kind of group, which I never knew even existed [before], is invaluable.

Caregivers also mentioned finding gratification in providing support to other caregivers and TNB youth either directly or through political or social media advocacy. Most mentioned that they

became involved with advocacy for the first time following their TNB youth's disclosure of their gender identity. One mother of a 14-year-old transgender girl described her experiences with political advocacy:

And that's the kind of mother I am now, you know, or still am. Like, I testified at the State House for the [TRANSGENDER-RELATED BILL]. And, you know, I've been writing editorials and, you know. So just I've turned into this activist that I didn't know I was....

Nearly all caregivers mentioned gathering information about TNB gender identities, or learning that their TNB child had gathered this information, shortly after their child disclosed their gender identity. Caregivers also highlighted online support groups on social media, in-person support groups, regional family events, conferences, and camps as sources of social support for themselves and their TNB youth. In response to being asked how her child felt about her reaction to his gender identity, the mother of a 13-year-old transgender boy shared how having external social support impacted her relationship with her child:

I think he was fine because I really wanted to understand it and he knew that I read a lot about it. He knew I went to PFLAG [organization for parents of LGBTQ+ children and adults] meetings, and he was happy when he heard I was going to a PFLAG meeting, so he felt supported.

Theme 4: Impacts of Community Connections

Theme 4 described connections between the family and TNB communities, as well as the TNB youth's connections to their school communities. Caregivers mentioned connections to TNB communities or individual community members, including the impacts of awareness of TNB celebrities, mental health outcomes of TNB youth, or experiences of other TNB youth through connections to other caregivers. Caregivers also discussed places where they and their TNB youth connected with other TNB youth, such as at summer camps, conferences, support groups, and school. These experiences were described by caregivers as affirming and supportive.

The mother of a 14-year-old transgender boy described her desire to find other TNB youth for her child to socialize with: “I worked extremely hard to find other parents in the area with trans children, and would set up, let's go to the mall and have coffee. I just wanted [TNB YOUTH] to meet other children like him.” The grandmother of a 14-year-old transgender boy described her experience taking her grandson to a conference for TNB youth and families:

We actually went out to [TOWN WITH TRANS CONFERENCE] just for the seminar back in [DATES], we went out on Saturday and we took a bunch of the classes out there and the courses, and I got to meet other families of transgender youth which was nice.

Caregivers also mentioned their TNB youth’s connections to school communities. While some caregivers described school-based bullying and fear of bullying or assault at school, many discussed experiences of affirmation by school peers, staff members, and administrators. The mother of a 13-year-old transgender boy shared her child’s experience with an affirming school group:

And as a side note, the school also started a GSA [gender and sexuality alliance], I think, a month ago, after all these kids came out. And it was funny because they were all FTM [female-to-male; i.e., assigned female at birth, gender identity of boy] too. ...It's a pretty popular club, and it was started by the homeroom teacher I told you about who everyone loves and there are actually more allies in the club which is a really good sign, I think. So it's a very supportive school. We're lucky, we're very lucky.

Theme 5: Societal and Organizational Factors

Theme 5 described how the family interacted with Societal and Organizational Factors, including policies and norms, in relation to the TNB youth’s gender identity. The impacts of policies at work and school, and health insurance policies were often mentioned. Participants also mentioned impacts of state-level politics, religious norms, and barriers to caring for their youth due to the combination of being the caregiver of a TNB youth and socioeconomic class (e.g., having limited funds to pay for or travel to appointments for gender affirming care.)

Additional factors included intersecting impacts of rural health inequities on access to gender-affirming care providers and support groups.

Health insurance company policies typically impacted families negatively; caregivers often mentioned gender-affirming medical care not being covered by insurance. In comparison, caregivers described the impacts of other factors as more mixed. For example, some caregivers mentioned difficulties with discriminatory school policies or lack of supportive school policies, while others mentioned impacts of supportive school policies. Some caregivers mentioned religious norms as a reason why a certain family member was not accepting, and others mentioned being members of religious organizations with norms that were TNB-affirming. Caregivers also discussed interacting with legal and healthcare system policies regarding name and gender marker changes, gender-affirming medical care, and mental health care. The mother of a 16-year-old transgender boy discussed communications with her family's health insurance company regarding her child's gender-affirming care:

We're currently appealing the denial of his top surgery [mastectomy] because he's [age] 16 and he's not going the usual route of testosterone first and then top surgery....It's like, you wish the insurance company wasn't giving you a hard time...It's annoying to have to put together an appeal and do things like that when it should be obvious, when it should be covered.

Caregivers also endorsed or observed gender norms rooted in a binary conception of gender. They shared how these norms shaped how they perceived their TNB youth. In response to a question about her child's gender expression on a typical day, the mother of a 16-year-old transgender boy shared her perception of boyhood and masculinity as it related to her child: "Oh, definitely boy. Definitely boy, his whole posture, the way he's just rough, he's loud, he's a slob. I mean, he's just clumsy and sloppy and yeah, he's definitely all boy."

Discussion

The objective of this study was to examine caregiver experiences of parenting TNB youth within the context of the social ecological model to better inform intervention development mental health outcomes among families and caregivers of TNB youth.^{22,24,102} We identified five primary themes describing the experiences of caregivers of TNB youth, which each mapped onto different levels of the social ecological model. Theme 1, Mental Health and Affect, discussed the mental health and emotional states experienced by caregivers and TNB youth, and mapped on to the individual level of the social ecological model. Theme 2, Interpersonal Factors, mapped on to the interpersonal level and described the interplay between interpersonal relationships and communication about a TNB youth's gender identity, as well as how these relationships and interactions impacted TNB youth and caregivers. Theme 3, Support Needed, Given, and Received, spanned across all levels of the social ecological model, and addressed support needed by caregivers and TNB youth, support given by caregivers to other caregivers of TNB youth, and support received by TNB youth and caregivers. Theme 4, Impacts of Community Connections, mapped on to the community level and described connections to TNB people outside of the family, and connections to schools and other community settings. Finally, Theme 5, Societal and Organizational Factors, mapped on to the societal and organizational levels, and included the impacts of organizational and state level-policies and norms.

Across themes, we identified similarities in opportunities for affirmation and connection, in stressors between youth and caregivers, and in caregiver labor and stress. We also identified several new and understudied aspects of caregiver experiences within these similarities that may be crucial to future intervention development for caregivers of TNB youth: 1) trends in supportive behaviors of family members, 2) benefits for caregivers in providing support to other

caregivers of TNB youth, and 3) caregiver stress and labor related to disclosing their TNB youth's gender identity to extended family members.

Opportunities for Affirmation and Connection

Caregivers described many opportunities for connection with their TNB youth and affirmation of their TNB youth's gender identity. For example, some immediate and extended family members had an unsupportive reaction when first hearing about a TNB youth's gender identity. However, caregivers described many of these family members as engaging in an increasing number of supportive behaviors with regards to the TNB youth's gender identity over time. These behaviors included more consistent use of their TNB youth's chosen name, more actions to support medical transition when needed, and increased actions to support youth at school, or among extended family. This finding is supported by prior work conducted among TNB individuals, which found that the sentiment of messages TNB people received from family members after beginning their gender transition were more likely to initially be negative, but became more positive over time. An additional study of TNB youth showed a significant increase in the percentage of current positive reactions from caregivers when compared to initial positive reactions following gender identity disclosure.^{103,104} Studies among caregivers also found that caregivers and extended family tended to be less accepting of TNB youth initially, but become more accepting with time.^{30,58,105,106} However, prior studies of caregivers do not define what is meant by an increase in acceptance of a TNB youth's gender identity. Additionally, in comparison to this study, prior studies do not report on whether there was an increase in caregiver's supportive behaviors over time. Studies show that a youth's perception of the family environment, vs caregiver perception is more strongly predictive of TNB youth mental health.⁵⁰ As a result, studying supportive behaviors of caregivers, vs caregiver perception of their own

acceptance or supportiveness, may provide more useful insights into youth's mental health, as well as areas for interventions among caregivers.

Shifts over time in the degree of supportive behaviors from family members could also indicate that more direct and personal exposure to TNB narratives and lived experience (e.g., through a TNB youth family member) can break down biases that drive unsupportive behavior.^{89,107} Providing caregivers of TNB youth, or the public at large with narratives about TNB youth may enable caregivers and extended family members to more easily engage in supportive behaviors towards their TNB youth, ultimately supporting TNB youth mental health. Informing TNB youth and caregivers about trends in increasing supportiveness among family members over time may also be helpful in easing discomfort and stress leading up to and immediately following disclosure of a TNB youth's gender identity.

In addition to these opportunities for affirmation with families, caregivers in the current study named many spaces where their TNB youth could connect to other TNB youth, including summer camps, gender conferences, support groups, and affirming student clubs in schools. These various settings have also been identified in previous studies as supportive environments for TNB youth.^{79,108} Given that research has documented fewer health concerns among TNB youth who feel socially supported,¹⁰⁹ connecting and supporting caregivers of TNB youth in helping youth to access such resources may also improve TNB youth mental health outcomes.

Caregivers in the current study also mentioned a need for social support for themselves from friends, other caregivers of TNB youth, coworkers, and therapists. In other studies, caregivers also discussed receiving social support from friends and relatives who are not the parent of a TNB youth, a partner, and even their own TNB youth.⁸³ Some caregivers in the

current study described challenges accessing social support, such as difficulty finding therapists or other caregivers of TNB youth with whom to connect. They also described experiencing stress when friends, coworkers, or family members were not affirming of their TNB youth's gender identity. Social support from other caregivers of TNB youth in particular has also been found to be a facilitator of caregivers engaging in behaviors that support their TNB youth.⁸⁹ Conversely, having a co-parent who is unsupportive of the family's TNB youth has been named as a source of stress.²⁹ Providing caregivers with information describing ways in which caregivers best receive social support may be useful to those struggling to find support, or to those with TNB youth who have recently disclosed their gender identity.

A final source of support for some caregivers in the current study was giving back to others by providing emotional and educational support to other families of TNB youth and conducting political advocacy work. Many caregivers found value and meaning in this work as well as connections with other caregivers of TNB youth. Prior research also documents caregivers giving back to other caregivers of TNB youth through providing emotional and educational support, and conducting political advocacy.^{29,110} However, to our knowledge, this study is the first to document how caregivers of TNB youth themselves were positively impacted by providing support and advocacy. For caregivers who are interested and able, providing support to other caregivers may serve as a way of improving mental health, both for themselves and their family, and also for other families of TNB youth. Political advocacy from caregivers also has the potential to reduce the harmful impacts of increasingly anti-TNB sociopolitical climates and policy implementation at local, state, and federal levels.^{49,111} As a result, empowering caregivers to engage in political advocacy may also be beneficial for both the family of the caregiver and other families of TNB youth.

Stressors Between Youth and Caregivers

Caregivers identified some points of tension between themselves and their TNB youth. Many caregivers felt they and/or other family members were supportive of their TNB youth if they vocalized that they accepted the TNB youth's gender identity, regardless of the degree to which they or other family members engaged in supportive behaviors, such as using a TNB youth's correct name or pronouns. Some caregivers also mentioned not understanding their TNB youth's emotional reaction to being called the incorrect name or pronouns. Similar findings were recorded in another study, where caregivers conceptualized their supportiveness as a matter of belief or moral values rather than specific behaviors.¹¹² Differing perspectives on what constitutes support has also been previously documented as a source of tension between TNB youth and caregivers¹¹³ and may be a driver of poor mental health outcomes among TNB youth and caregivers.

Another stressor stemmed from caregivers' fear for their TNB youth's future safety as a TNB individual in a society in which TNB people experience discrimination. This finding has also been corroborated in two other studies.^{79,114} This type of future-oriented thinking and the fears expressed by caregivers generally have been identified as barriers to caregiver acceptance of their TNB youth's gender identity.^{89,110} Opportunities for connection and affirmation referenced above may play a role in buffering these stressors, however, further research is needed.

Relationship Between Caregiving Labor and Stress

When TNB youth disclosed their gender identity to caregivers, caregivers often engaged in new and sometimes stressful caregiving labor. Nearly all caregivers were responsible for

disclosing their TNB youth's gender identity to extended family, often in the form of individual phone calls to each family member and/or a long email, social media post, or letter sent to family. While previous studies have documented caregiver experiences of disclosing their TNB youth's gender to extended family,¹⁰⁶ to our knowledge, studies rarely discuss the labor associated with, or the frequency of caregiver-facilitated disclosure to extended family. Further examining and supporting caregivers in disclosing their TNB youth's gender to extended family may help support caregiver and TNB youth mental health.

Caregivers also often worked with schools to ensure their TNB youth was addressed with the correct name and pronouns and had access to gender-congruent bathroom, locker facilities and sports opportunities. They also reported searching for gender-affirming care, such as gender-affirming counseling, pubertal blockers, hormones, and surgery; communicating with insurance and appealing insurance decisions; and attempting to locate TNB community connections for their TNB youth and/or themselves, as have caregivers in prior studies.^{79,89,105}

Engaging in these caregiver responsibilities enables one's TNB youth to access resources and environments that have been shown to reduce mental health disparities.^{3,115-117} However, many caregivers noted that accessing these resources and working to shape supportive environments at school and in families often required substantial time and energy, as described in this and two prior studies.^{87,106} Caregivers and families who are already experiencing additional stressors, such as systemic marginalization (e.g., sexism, racism, ableism, classism), additional financial or medical difficulties, or stressful interpersonal relationships, may have less time, energy, and/or emotional resources to support their TNB youth. Additionally, among caregivers in the current study who were in woman/man partnerships, cisgender women more often mentioned taking on these responsibilities than cisgender men. This unequal, gendered

distribution of responsibilities related to having a TNB child mirrors normative gendered distributions of childcare-related labor in woman/man couples.^{106,110,118} This additional labor may place added stressors on cisgender women partnered with cisgender men, yielding adverse impacts on cisgender women caregivers' mental health.¹¹⁹ Further, interventions to reduce the stress of labor experienced by caregivers may reduce poor mental health outcomes among TNB youth. Due to the multidirectional impacts of gender identity disclosure on both a TNB youth and their caregivers, a family systems lens is critical to understanding experiences and developing interventions for TNB youth and families.^{79,108}

Strengths and Limitations

This study documented novel and understudied findings that may be crucial to future intervention development among caregivers of TNB youth. These included trends in increased supportive behaviors among family members over time, the benefits for caregivers of TNB youth when providing support to other caregivers and engaging in political advocacy, and the stress caregivers experienced in disclosing their TNB youth's gender identity to extended family. These findings are further strengthened by the TTFN Project's application of community-based participatory research principles, incorporating input from TNB youth, families, and related organizations into all aspects of study design, data collection, and analysis.⁹⁹ The study's comprehensive interview guide allowed us to discern information about family functioning in relation to a TNB youth's gender identity, which is a unique aspect of this study in the context of TNB mental health research. By discussing positionality and employing thematic analysis and immersion/crystallization, we engaged in a rigorous analytic process. Additionally, our study's sample size of 48 caregivers of TNB youth, the largest of any study in this area of research, allowed us to analyze a wide range of experiences of caregivers relative to other studies. In

particular, one-third (n=15) of our sample was cisgender men, who are often underrepresented in similar studies.^{79,89,110,120}

Regarding limitations, caregivers in the current study were predominantly White and had above-average levels of education and socioeconomic status compared to the general US population. This limited our ability to draw conclusions about the ways in which cultural differences, racism, and classism differentially shape experiences of caregivers of color and low socioeconomic status families of TNB youth compared to families with White caregivers and high socioeconomic status families. Most caregivers interviewed were biological or adoptive parents in a married couple with a cisgender man and a cisgender woman, which prevents us from developing a broader understanding of experiences of caregivers with same-gender and/or TNB partners. Experiences of non-parent caregivers (e.g., grandparents) and diverse family structures (e.g., families with more than two caregivers) were also underrepresented. Lastly, our sample was one in which TNB youth had disclosed their gender identity to at least one caregiver and where all participants lived in New England, a region known for higher levels of support for TNB youth.³² Therefore, our sample may be biased towards families who are more accepting of their TNB youth's gender identities, though we still found a range of acceptance among the caregivers and families in the sample.

Implications for Policy, Community-Based Interventions, Clinical Practice, and Future Research

Caregivers described an array of emotions, stressors, and relationship shifts following their TNB youth's initial gender identity disclosure. Those experiencing the weight of such stressors may benefit from improved access to mental health services, including both individual

and family therapy.^{28,30,79,89,121,122} Given that TNB youth and families have underserved mental health needs, experiences of caregivers and TNB youth in this and future studies should be used to improve training for mental health providers and increase availability of knowledgeable providers. Additional therapeutic resources such as online toolkits¹²³ and support groups can provide caregivers with evidence-based information to help bolster their support of their TNB youth and support themselves as well. Caregiver-facilitated support programs for other caregivers may be mutually beneficial for those giving and those receiving support. Online resources are especially important for caregivers living in regions with limited in-person resources and/or in discriminatory sociopolitical climates, which increase the risk of adverse mental health outcomes among TNB youth.¹²⁴ Access to 1) accurate and easily accessible educational resources for parents and caregivers via online modules,²⁸ 2) national online peer support groups for caregivers of TNB youth,²⁷ and 3) positive representations of TNB individuals⁸⁹ may provide caregivers with the emotional support and information needed to mitigate some of the harmful impacts of discriminatory political climates. Additionally, when states threaten to remove TNB youth from the homes of caregivers who support them,^{95,96} accessing out-of-state online social support and advocacy networks may be the safest way to identify important information.

All of the above-mentioned suggestions for interventions are promising and needed. However, it is notable that these and the limited empirically tested interventions for caregivers of TNB youth nearly exclusively focus on directly providing caregivers with educational resources and emotional/therapeutic support at the individual and interpersonal level.⁷⁴ Interventions should also target caregiver needs at other levels of the social ecological model. For example, to reduce the labor required of caregivers to navigate anti-TNB discriminatory policies at the

organizational level (e.g. in schools or in health insurance companies), interventions could pair caregivers with professionals trained in navigating policies in these environments to work on the family's behalf. To mitigate the impacts of classism on access to resources at the community and organizational levels, interventions could provide funds for families to access medical care, or to travel to and attend in-person support events, such as camps and conferences. To reduce harmful impacts of anti-TNB policies and norms at the societal level, interventions could provide interested caregiver advocates with training on how to effectively share their experiences with policymakers and the public. To fully address the needs of caregivers of TNB youth described in this and other studies, a multi-level approach is needed.

Future research with caregivers of TNB youth should also engage families with a variety of cultural backgrounds, family structures, and lived experiences. TNB youth of color experience unique, intersecting combinations of racism and cissexism; therefore, family support may be an especially critical protective factor for Black and Latinx TNB youth and other youth of color.¹²⁵ Culturally specific beliefs and gender norms may also influence caregiver-youth relationships for TNB youth.⁵⁸ Greater recruitment of caregivers of color in TNB caregiver studies would aid researchers and clinicians in learning how better to support all TNB youth. Future research on caregivers experiences should also clearly distinguish between caregivers' self-reported acceptance of their TNB youth and the supportive behaviors with which caregivers engage (e.g., use of youth's correct name and pronouns, interacting with school personnel regarding youth's needs). Studies should also examine trajectories in caregiver enactment of supportive behaviors following a youth's gender identity disclosure to determine the degree of support offered to TNB youth over time. Additionally, quantitative research with nationally representative samples of

caregivers and TNB youth is critical to aid in the creation of evidence-based interventions, as such studies are still limited in number and geographic scope.

Conclusions

This study adds to an understudied, yet critical area of research at a time where caregivers are often the first line of protection for TNB youth against the harmful impacts of a discriminatory sociopolitical climate.¹²⁶ This analysis centers voices of those who hold the power to decide whether TNB youth receive access to essential forms of care and support. Their narratives must inform the work of interventionists, clinicians, researchers, advocates, and policymakers in striving to support healthy children and families. In a time when several US states have attempted to categorize supporting TNB youth as abuse,^{95,96} creating environments where caregivers are understood and opportunities for caregivers to receive multiple forms of support at multiple levels is critical to the health of TNB youth.

Chapter 3: Mental health inequities among gender-diverse U.S. college students: An intersectional MAIHDA analysis by gender identity, race/ethnicity, and socioeconomic status.

Introduction

Suicidality, depression, and other mental health concerns are exceptionally high among transgender and/or nonbinary (TNB) youth and young adults (those whose sex assigned at birth does not align with their gender identity) relative to cisgender individuals (those whose sex assigned at birth aligns with their gender identity).¹⁻⁷ In a national study, TNB college students reported rates of current depression (58%), past-year suicidal ideation (35%) and past-year suicide attempts (3%) that were substantially higher than those of their cisgender peers (28% depression, 10% suicidal ideation, 0.8% suicide attempts).⁶ Additionally, studies have documented reduced prevalence of positive mental health (e.g., flourishing) among TNB college students compared to cisgender students.^{127,128} These disparities are corroborated by numerous studies; however, population-based data sources measuring gender identity and mental health are often limited in geographical scope and/or do not include validated measures of gender identity.^{7,129-133}

The Minority Stress Model and the related Gender Minority Stress Model posit that TNB populations experience unique external and internal stressors related to the stigma associated with being TNB, which result in psychological distress and mental health inequities.¹⁴⁻¹⁶ Stressors occur at multiple levels, including structural and interpersonal. Structural stressors include social conditions, such as discriminatory cultural norms and discriminatory institutional policies, or the absence of equitable policies, and are associated with increased experience of

interpersonal and internal stressors.^{14,17} Interpersonal stressors can manifest in various contexts including in relationships with friends, family, and in community settings (e.g., schools, work, places of worship). These stressors can include anti-TNB harassment (e.g., misgendering) or hate crimes, familial rejection, or lack of acceptance of a TNB youth's gender. Internal stressors are often driven by external stressors, including interpersonal stressors, and include internalized transphobia, rejection sensitivity, and concealment of one's gender identity. Internalized transphobia is defined as belief in negative attitudes about one's gender identity.¹⁴ Rejection sensitivity is a fear of exclusion from social interactions or relationships based on previous experiences of rejection due to membership in a marginalized group (e.g., being TNB). Identity concealment includes hiding one's TNB identity from friends, family, teachers, coworkers, and others, which can result in unintentional microaggressions and delayed access to needed services such as gender affirming care.¹⁴ These stressors can also result in psychological distress through multiple mechanisms. For example, TNB individuals are more likely to experience job and housing discrimination, which can directly lead to stress, and also result in a higher likelihood of experiencing poverty, homelessness, and overall reporting a lower socioeconomic status (SES).¹⁸⁻²⁰

Black and Latine (compared to White) youth and young adults across genders report mental health disparities starting in adolescence that widen with age and vary by SES.¹³⁴⁻¹⁴² Disparities among people of color are also prevalent among college students. A national US study found that Latine, Arab, and Asian students reported higher rates of depression and eating disorders compared to students outside of their racial/ethnic group. Arab students also reported higher rates of anxiety compared to other students, and multiracial students reported higher rates of all measured negative mental health outcomes (depression, anxiety, eating disorders, non-

suicidal self-injury, and suicidal ideation.) Disparities in positive mental health outcomes also exist across experiences of race/ethnicity; Asian and multiracial students report lower odds of flourishing when compared to White students or to all other students, while Black students report greater odds of flourishing.^{127,135,143}

Additionally, college students of color reported low mental health service utilization, and students with current or historical financial stress had higher odds of experiencing any negative mental health outcome.¹³⁵ Similar disparities in mental health concerns and flourishing among students of color and low SES college students have been found in numerous other studies.^{137–140,142,144} Additionally a secondary analysis of eight epidemiologic studies of psychological distress in adults by race/ethnicity found that when failing to model interactions between race/ethnicity and SES, models underestimated disparities by race/ethnicity and overestimated disparities by SES. These findings highlight the need for an intersectional approach to examining TNB mental health disparities by both race/ethnicity and SES.¹⁴⁵

While some studies document disparities in TNB mental health by race/ethnicity,^{146–150} there are no known studies that have quantified the mental health of TNB individuals across intersections of both race/ethnicity and SES. For instance, Walubita et al. 2022 performed an intersectional analysis of mental health across gender identity, race/ethnicity, and sexual orientation in a population-level sample of US adults and found intersectional variability in predicted prevalences of mental distress, but did not include SES, or restrict analysis to young adults.¹⁴⁶ Another population-level study of US adults categorized participants by gender identity and race/ethnicity. They found some differences in mental distress by gender identity and race/ethnicity but controlled for SES with no interaction terms, which might have resulted in

underestimation of the magnitude of disparities by race/ethnicity.^{145,147} A third population-level study of California high school students used an interaction term to model subgroups across gender identity and race/ethnicity, finding higher rates of depression and suicidal ideation among TNB Latine and TNB multiracial students compared to White cisgender youth, but did not include SES.¹⁴⁸ Notably, only one of these analyses was restricted to college students, none included measures of suicide attempts or positive mental health, and none used an intersectional framework to assess the magnitude of mental health inequalities across gender identity, race/ethnicity, and SES.

Grounded in Black feminist scholarship,^{33,34} an intersectional framework offers rigorous and theoretically grounded tools with which to address the above mentioned gaps in TNB mental health literature.³⁵⁻³⁷ An intersectional framework highlights the importance of accounting for the ways in which social positions (e.g., gender, race/ethnicity, and SES) interact with multiple forms of oppression to influence health.^{35,36,38-41} Prior to the beginning of the second Trump Administration in January 2025, the National Institutes of Health (NIH) had identified intersectionality as a “key lens for health disparities research,” particularly for research on TNB populations, a view still affirmed by leading health disparities researchers.^{42,43} However, conventional approaches for quantitatively engaging with intersectionality do not account for the unique experiences of living at the intersections of multiple social categories, e.g., gender, race/ethnicity, and SES. They rely instead on single-level, additive models or two- or three-way interaction models, which neglect essential components of an intersectional framework and face sizable statistical limitations in modeling high dimensional data.^{37,41,151-153} These limitations are particularly relevant when modeling intersectional data of TNB people in national or representative data sets. For example, when clustering data across only two or three

sociodemographic variables in a data set with a small number of TNB participants, if one of the variables is gender identity, high dimensional groupings¹⁵⁴ (e.g. very small groups of multiply marginalized individuals) will easily manifest.

In comparison to conventional approaches, multilevel quantitative intersectional methods, such as Multilevel Analysis of Individual Heterogeneity and Discriminatory Accuracy (MAIHDA), conceptually align better with an intersectional framework and provide methodological benefits.^{37,151–153,155} For instance, when working with higher dimensional data encompassing minority populations, such as TNB populations, MAIHDA models will converge and provide more reliable estimates despite small cell sizes, due to precision weighting.^{151–153} Further, including a larger number of intersectional subgroups in MAIHDA models yields greater (not less) statistical power to detect effect sizes.¹⁵⁶ These advantages make MAIHDA the gold standard in quantitative intersectionality research.^{151,157} However, these multilevel approaches are underutilized in public health research, especially in TNB mental health research.¹⁴⁶ These critical gaps in mental health disparities work must be addressed to advance health equity for TNB individuals.

College campuses offer unique opportunities to document the heterogeneity in TNB mental health across intersections of race/ethnicity and SES, particularly among TNB youth and young adults. Over 19 million students are enrolled in US higher education, representing approximately 61% of recent high school graduates.^{158,159} Additionally, adverse mental health outcomes are pervasive among college students across gender identities,^{137,160} and outcomes are especially poor among TNB students.^{4–7,150} Furthermore, the proportion of TNB students and students of color in the US is increasing, which underscores the public health importance of

focusing on these populations.^{8,161} College campuses also present unique opportunities for developing and implementing comprehensive policy-level interventions. However, to our knowledge no studies have examined the mental health of TNB college students across intersections of both race/ethnicity and SES.

This study addressed weaknesses in the rigor of prior research by using a quantitative intersectional approach to examine the distribution of college student mental health outcomes across gender identity, race/ethnicity, and SES using MAIHDA. The goal of this study was to examine disparities in TNB mental health across intersecting social positions defined by gender identity, race/ethnicity, and SES. We hypothesized that there would be variation in the magnitude of mental health disparities for students across social positions of gender identity, race/ethnicity, and SES. Further, we expected that multiply marginalized TNB students (students experiencing multiple forms of systemic oppression, e.g. TNB multiracial students) would report a greater magnitude of mental health disparities than their singly marginalized peers.

Methods

Study Sample

We used Fall 2020-Spring 2023 survey data from the Healthy Minds Study (HMS), a national survey with detailed, repeated cross-sectional data on social identities and mental health symptomatology from 389 institutions of higher education across 43 US states.¹⁶² HMS is one of few national surveys to include both a validated, two-step measure of gender identity and detailed screens for mental health symptoms.^{6,129-132,163} HMS campuses range in size from 1,000 to >20,000 students, and include community colleges, religious campuses, Historically Black Colleges and Universities (HBCUs), and both public and private institutions. All college

campuses are eligible to participate in HMS. At each institution, a random sample of enrolled students are invited to participate in the survey; all students are invited to participate from schools with small enrollment. Data are collected annually via computers or smartphones through the Qualtrics platform. Further details regarding HMS data collection procedures and sample characteristics are published elsewhere.¹⁶²

Measures

Gender Identity. Based on best practices for measuring gender identity,^{129–131} TNB students were identified by discordance between sex assigned at birth (“What was your sex assigned at birth?” 1) Female, 2) Male, 3) Intersex) and current gender identity (“What is your gender identity? Select all that apply:” 1) Female, 2) Male, 3) Transgender female, 4) Transgender male, 5) Nonbinary, 6) Genderqueer/Gender non-conforming, 7) Self-identified). Gender identities were re-coded into 6 categories: 1) Transgender women 2) Transgender men 3) Nonbinary, assigned male at birth (AMAB), 4) Nonbinary, assigned female at birth (AFAB), 5) Cisgender women, and 6) Cisgender men. Participants coded as nonbinary reported their gender identity as nonbinary, genderqueer/gender non-conforming, self-identified as such, or described themselves using multiple gender identities. We used data provided in an open text field for those who selected “self-identified” to recode participants when applicable (e.g., participants who reported their sex assigned at birth as female, selected their gender as “self-identified” and wrote in the open field, “Woman - female is a sex, not a gender,” or similar sentiments were re-coded as cisgender women).

Race/ethnicity. Race/ethnicity was measured with a “select all that apply” question (“What is your race/ethnicity?” with response options 1) African American/Black, 2) American

Indian or Alaskan Native, 3) Asian American/Asian, 4) Hispanic/Latin(x), 5) Native Hawaiian or Pacific Islander, 6) Middle Eastern, Arab, or Arab American, 7) White, and 8) Self-identified.) Racialization/ethnicity categories were re-coded into 14 mutually exclusive categories: 1) American Indian/Alaskan Native, 2) American Indian/Alaskan Native and White, 3) Asian, 4) Asian and White, 5) Black and Hispanic or Latine, 6) Black or African American, 7) Black/African American and White, 8) Hispanic or Latine, 9) Hispanic or Latine and White, 10) Middle Eastern/Arab, 11) Middle Eastern/Arab and White, 12) Multiracial or Monoracial of another race/ethnicity, 13) Native Hawaiian/Pacific Islander, and 14) White. Multiracial participants were disaggregated as much as was feasible regarding strata sizes to avoid monoracial-normative assumptions surrounding relationships between racial discrimination and mental health across diverse multiracial participants.¹⁶⁴ We used data provided in an open text field for those who selected “self-identified” to recode participants when applicable (e.g., participants who reported their race/ethnicity as only “self-identified” and wrote, “Hispanic (not Latin(x)),” or similar sentiments, were re-coded as Hispanic or Latine).

Parent Education. SES was measured via parental education (“What is the highest level of education completed by your parents, step-parents, or guardians?” 1) 8th grade or lower, 2) Between 9th and 12th grade (but no high school degree), 3) High school degree, 4) Some college (but no college degree), 5) Associate’s degree, 6) Bachelor’s degree, 7) Graduate degree, 8) Don’t know) and dichotomized by first generation college student status where either 1) all parents obtained some college but no degree, or less (first generation students), or 2) any parent obtained an Associate or Bachelor’s degree or higher (continuing generation students).¹⁶⁵

Mental Health Outcomes. In HMS, suicidality was measured with two items from the National Comorbidity Survey Replication¹⁶⁶: 1) suicidal ideation (“In the past year, did you ever seriously think about attempting suicide?,” and 2) suicide attempts (“In the past year, did you attempt suicide?”). Response options for both were yes/no, and only those who reported suicidal ideation were asked about suicide attempts. Depression was measured using the 9-item Patient Health Questionnaire (PHQ-9) and was modeled continuously (range 0-27).^{167–169} Positive mental health was measured via summary score of Diener et al.’s (2009) Flourishing Scale, using 8 items and a 7-point Likert scale to quantify positive mental health.¹⁷⁰

Covariates. We included age as a covariate to improve comparability across social positions as we anticipated high variability in depressive symptoms and suicidality in late adolescence compared to young adulthood. Controlling for age also accounted for heterogeneity in mental health outcomes by gender identity, race/ethnicity, and parental education in late adolescence compared to young adulthood.¹⁷¹ Additional covariates were not included so as to refrain from controlling for potential mediators and biasing results, which reflects best practice for descriptive epidemiology and quantitative intersectional methodologies.^{37,172}

Statistical Analysis

The final analytic sample was N=175,719. We excluded students who reported their sex assigned at birth as intersex (n=670) due to insufficient sample sizes for intersectional analyses across social positions. We also excluded participants who were missing data on social position variables (gender identity, n=1,875, 1.07%; race/ethnicity, n=1,418, 0.81%; SES, n=7,319, 4.17%), age (no missing data) or, for a given model, relevant outcome variables.

Social Strata. We created 113 strata based on participants' social positions across the six categories of gender identity, 14 categories of race/ethnicity, and two categories of parent education. After disaggregating data into an initial possible 168 strata ($6 \times 14 \times 2 = 168$), strata were aggregated across levels of parent education if at least one stratum for a given gender identity and racial/ethnic group was $n < 10$. Ten strata contained no participants, yielding a final total of 113 with $n > 9$ strata in the final analysis. (E.g., there were $n = 7$ first generation American Indian/Alaskan Native Nonbinary AFAB students and $n = 8$ continuing generation American Indian/Alaskan Native Nonbinary AFAB students. These strata were combined into one stratum of American Indian/Alaskan Native Nonbinary AFAB students across parent education.) In selecting which categories to aggregate, we prioritized the inclusion of TNB and racialized groups who have been underrepresented in epidemiologic research. Most strata ($n = 101$; 75%) had 20 or more participants, and strata sizes varied substantially (range 1-53,936). Participants from all strata were retained in analyses; however, we did not calculate strata-level estimates for those strata with $n < 10$ ($n = 15$; 11%.)

Statistical Models. We ran three sets of two-level models for each outcome. Outcomes (level 1) were nested under 113 intersectional strata (level 2) defined by a participant's social positions across categories of gender identity, race/ethnicity, and parent education as described above in each model set. Model set 1 included no level 1 fixed effects (equation 1). Model set 2 included level 1 fixed effects for gender identity, race/ethnicity, and SES (equation 2). Model set 3 was identical to model set 2 but additionally controlled for age.

$$\text{logit}(\pi_{ij}) = \beta_0 + \mu_{0j} \text{ (equation 1)}$$

$$\text{logit}(\pi_{ij}) = \beta_0 + \beta_1(\text{gender}_j) + \beta_2(\text{race/ethnicity}_j) + \beta_3(\text{SES}_j) + \beta_4(\text{age}_j) + \mu_{0j}$$

(equation 2)

$$y_{ij} \sim \text{Binomial}(1, \pi_{ij}) \quad ; \quad \mu_{0j} \sim N(0, \sigma_{u0}^2) \text{ (for both models)}$$

With model set 1, we estimated the precision-weighted predicted levels of the outcomes as descriptive statistics for each stratum. For logistic models, we converted a stratum's predicted log-odds of an outcome to predicted probabilities for interpretability.¹⁵⁷ In strata with <10 participants, we did not interpret predicted levels of outcomes out of a significant abundance of caution,¹⁷³ but participants were retained for statistical power. With model set 2, we calculated excess levels of an outcome due to intersectional interactions from level 2 residuals for each stratum to assess whether a predicted probability was attributable to interactions across social positions.¹⁵⁷

For all model sets, we calculated two overall intersectional effects for each outcome: the Variance Partition Coefficient (VPC; primary outcome of interest) and the Proportional Change in Variance (PCV). VPC measures the proportion of variation in the outcome attributed to social position and is calculated as $\sigma_u^2 / (\sigma_u^2 + \sigma_e^2) * 100$, where σ_u^2 is the variance between subgroups and σ_e^2 is the proportion of variance within subgroups ($\sigma_e^2 = \pi^2 / 3 =$ in logistic models). A higher VPC indicated a higher level of discriminatory accuracy for prediction at the level of the individual.^{152,157,174} PCV indicates the proportion of between subgroup variance remaining after adjusting for additive effects of social position and is calculated as $(\sigma_{u1}^2 - \sigma_{u2}^2) / \sigma_{u1}^2 * 100$, where σ_{u1}^2 is the between-subgroup variance in model set 1 and σ_{u2}^2 is the between-subgroup variance in model set 3 for a given outcome.^{152,157} PCV is considered model specific and cannot

be compared across models,¹⁷⁵ though larger numbers generally indicate that an intersectional impact has greater explanatory power.¹⁵²

Results

Sociodemographics

The majority (68.2%) of participants were cisgender women, and 5.6% were TNB. The majority of TNB participants were AFAB and nonbinary (4.2% of the total sample). The sample was predominantly White (57.7%), with 12.4% Asian, 10.0% Hispanic or Latine, 7.7% Black or African American, and 11.0% multiracial or another race/ethnicity. First generation students made up 28.0% of the sample, and the mean age of participants was 23.4 years. Mean PHQ-9 score was 9.2 (values ranged 0-27) and mean positive mental health score was 42.8 (values ranged 8-56), respectively (Table 3.1). Regarding suicidality, 12.7% of the sample reported suicidal ideation and 1.2% of the sample reported suicide attempts.

Table 3.1. Sample Demographics

Characteristics	N	%
Gender Identity		
Cisgender Boy/Man	45,671	25.99
Cisgender Girl/Woman	119,851	68.21
Nonbinary, AFAB	7,369	4.19
Nonbinary, AMAB	1,259	0.72
Transgender Boy/Man	1,143	0.65
Transgender Girl/Woman	426	0.24
Race/Ethnicity		
American Indian/Alaskan Native	416	0.24
American Indian/Alaskan Native and White	946	0.54
Asian	21,732	12.37
Asian and White	2,939	1.67
Black and Hispanic or Latine	1,090	0.62
Black or African American	13,494	7.68
Black/African American and White	1,917	1.09
Hispanic or Latine	17,546	9.99
Hispanic or Latine and White	6,339	3.61
Middle Eastern, Arab, Arab American	2,374	1.35
Middle Eastern/Arab and White	1,006	0.57
Multiracial or Monoracial of another race/ethnicity	4,289	2.44
Native Hawaiian/Pacific Islander	231	0.13
White	101,400	57.71
Parent Education		
First Generation College Students	49,238	28.02
Age		
18-22	117,635	66.94
23-27	29,422	16.74
28-32	12,525	7.13
33-40	8,709	4.96
40-50	4,915	2.80
60+	2,513	1.43
Depression Symptoms; <i>M, SD</i> (range 0-27)	9.21	6.48
Suicidal Ideation	22,290	12.69
Suicide Attempts	2,169	1.23
Positive Mental Health; <i>M, SD</i> (8-56)	42.78	9.03

Table 3.1 Note: Abbreviations: AFAB, assigned-female-at-birth; AMAB, assigned-male-at-birth. Continuing generation college students are those who had at least one parent complete a college degree. First generation college students are those whose parent(s) may or may not have attended college, but do not have a college degree.

Intersectional MAIHDA

Main Effects. Across all outcomes, strata including TNB students had poorer outcomes compared to cisgender men (the referent group). The magnitude of these differences was substantial. For instance, odds of suicidal ideation and attempts among transgender women were 4.95 (CI: 3.89–6.31) and 5.51 (CI: 3.47–8.74) times higher, respectively, than those of cisgender men. Among cisgender women, depression symptoms and odds of suicidal ideation were also higher compared to cisgender men (β : 1.72, CI: 1.50–1.94; OR: 1.22, CI: 1.13–1.31, respectively). Across experiences of race and ethnicity, biracial Black and Indigenous students and multiracial or monoracial students of another race had worse outcomes compared to monoracial White students. For example, odds of suicide attempts were 3.62 times greater among biracial American Indian/Alaskan Native and White students than among monoracial White students (CI: 2.55–5.13) and 2.37 times greater among multiracial or monoracial students of another race (CI: 1.93–2.91). Odds of suicide attempts among Native Hawaiian/Pacific Islander students were especially high (OR: 3.44, CI: 1.52–7.79).

Compared to White students, monoracial Asian students had reduced odds of suicidal ideation and estimates of depression symptoms (OR: 0.84, CI: 0.75–0.94; β : -0.48, OR: (-0.84–0.12), though higher odds of suicide attempts and poorer positive mental health (OR: 1.21, CI:

1.05–1.39; β : -1.04 CI: -1.49–0.59). Monoracial Black students had greater odds of suicidal ideation and attempts (OR: 1.13, CI: 1.01–1.27; OR: 2.24 CI: 1.95–2.57, respectively), but slightly increased positive mental health (β = 0.87, CI: 0.40–1.34). Monoracial Hispanic/Latine students and biracial Hispanic/Latine and White students reported greater odds of suicide attempts compare to White students (OR: 1.36, CI: 1.17–1.58; OR: 1.30, CI: 1.04–1.61, respectively); no other outcomes among these groups were statistically significant.

First generation students reported poorer outcomes compared to continuing generation college students; for example, odds of suicidal ideation and suicide attempts were 1.17 (CI: 1.10–1.25) and 1.30 (CI: 1.17–1.42), respectively. A one-year increase in age was associated with fewer depression symptoms, reduced odds of suicidality, and increases in positive mental health. For instance, a 1-year increase in age was associated with 7% reduced odds of suicide attempts (OR: 0.93; CI: 0.92–0.94; Table 3.2). Overall, changes in the significance of main effects between the unadjusted intersectional model and the age-adjusted intersectional model were minor, and changes in the magnitude of estimates were relatively small; a table of unadjusted results can be found in the appendix (Table S1).

Table 3.2. Fixed Effects of Intersectional MAIHDA Models

	Depression Symptoms		Suicidal Ideation		Suicide Attempts		Positive Mental Health	
	OR	CI	OR	CI	OR	CI	OR	CI
Simple unadjusted intersectional model								
Random Effects								
Between-stratum variance	6.4	-	0.5	-	0.6	-	8.5	-
VPC, %	13.8	-	13.6	-	14.7	-	14.7	-
Age-adjusted intersectional model								
Gender Identity								
Transgender Women	4.39	3.63 – 5.14	4.95	3.89 – 6.31	5.51	3.47 – 8.74	-6.18	-7.21 – -5.16
Transgender Men	4.96	4.45 – 5.47	3.77	3.19 – 4.46	4.28	3.18 – 5.76	-5.49	-6.17 – -4.80
Non-binary, AFAB	4.97	4.44 – 5.50	4.68	3.94 – 5.55	3.93	2.85 – 5.40	-5.41	-6.12 – -4.70
Non-binary, AMAB	5.89	5.58 – 6.19	4.15	3.76 – 4.59	3.17	2.72 – 3.71	-5.68	-6.08 – -5.28
Cisgender Women	1.72	1.50 – 1.94	1.22	1.13 – 1.31	1.06	0.96 – 1.18	-0.27	-0.55 – 0.01
Race/Ethnicity								
American Indian/Alaskan Native	1.15	0.41 – 1.89	1.01	0.73 – 1.40	2.03	0.95 – 4.33	-0.96	-1.96 – 0.04
American Indian/Alaskan Native and White	1.38	0.82 – 1.94	1.64	1.35 – 2.00	3.62	2.55 – 5.13	-1.30	-2.04 – -0.56
Asian	-0.48	-0.84 – -0.12	0.84	0.75 – 0.94	1.21	1.05 – 1.39	-1.04	-1.49 – -0.59
Asian and White	0.03	-0.43 – 0.49	1.06	0.91 – 1.24	1.16	0.84 – 1.62	-0.28	-0.87 – 0.32
Black/African American	-0.24	-0.62 – 0.13	1.13	1.01 – 1.27	2.24	1.95 – 2.57	0.87	0.40 – 1.34
Black/African American and Hispanic/Latine	1.06	0.50 – 1.61	1.23	1.00 – 1.50	1.91	1.24 – 2.94	-0.50	-1.24 – 0.23
Black/African American and White	0.76	0.28 – 1.24	1.38	1.18 – 1.62	2.06	1.52 – 2.81	-1.04	-1.66 – -0.41
Hispanic/Latine	0.18	-0.18 – 0.54	0.91	0.81 – 1.02	1.36	1.17 – 1.58	-0.19	-0.65 – 0.26

Table 3.2 (Continued)

Hispanic/Latine and White	0.30	-0.09 – 0.69	1.07	0.94 – 1.21	1.30	1.04 – 1.61	-0.16	-0.66 – 0.34	
Middle Eastern/Arab	0.58	0.11 – 1.05	0.86	0.72 – 1.03	1.05	0.69 – 1.61	-0.77	-1.38 – -0.17	
Middle Eastern/Arab and White	0.55	-0.04 – 1.13	1.00	0.80 – 1.26	0.99	0.53 – 1.86	-0.38	-1.15 – 0.39	
Multiracial or Monoracial of Another Race	1.21	0.80 – 1.62	1.46	1.28 – 1.66	2.37	1.93 – 2.91	-0.86	-1.39 – -0.34	
Native Hawaiian/Pacific Islander	0.95	0.01 – 1.90	1.21	0.80 – 1.82	3.44	1.52 – 7.79	0.60	-0.69 – 1.89	
First Generation College Students	0.95	0.75 – 1.14	1.17	1.10 – 1.25	1.29	1.17 – 1.42	-1.10	-1.35 – -0.84	
Age	-0.11	-0.11 – -0.11	0.96	0.96 – 0.96	0.93	0.92 – 0.94	0.11	0.10 – 0.11	
χ^2 Random Effects									
Between-stratum variance	0.1		0		0		0.1		
VPC, %	0.2		0.2		0		0		
PCV, %	98.6		98.7		100		98.4		

Intersectional Effects. Within the simple intersectional models, 13.6-14.7% of the variation in outcomes was driven by between-stratum differences (see VPC, Table 2.2). Within the adjusted intersectional models, the VPCs across all outcomes decreased to almost 0% with the addition of additive main effects of gender identity, race/ethnicity, SES, and age. PVC across outcomes were close to or at 100%, indicating that nearly all the between-stratum outcome variation was driven by the additive main effects of gender identity, race/ethnicity, SES, and age vs intersectional interactions.

Predicted Outcomes Across Strata. Across 113 strata with $n > 9$, predicted depression symptomatology scores ranged from 7.3-15.7 on a scale of 0-27, where a score of 10 or greater indicates clinically relevant symptomatology (i.e., a positive screen for symptoms of major depression). Most strata ($n=78$) had predicted estimates of depression symptoms above 10, but no strata of cisgender men had estimates above 10. The predicted prevalence of past-year suicidal ideation ranged from 8.9-47.9%. Predicted prevalence of past-year suicide attempts ranged from 0.87-10.8%. Predicted estimates of positive mental health scores ranged from 44.5-35.5 on a scale of 8-56. Predicted estimates of depression symptomatology, prevalence of suicidal ideation, and prevalence of suicide attempts were highest in a stratum of first generation biracial American Indian/Alaskan Native and White nonbinary AFAB students. Positive mental health was lowest within a stratum of first generation biracial Black/African American and White nonbinary AFAB students. The lowest estimates for depression symptoms and prevalences of suicidal ideation, suicide attempts, and the highest scores for positive mental health were found in the following strata: continuing generation Black/African American cisgender men, continuing generation Asian cisgender men, continuing generation White cisgender men, and first generation Black/African American cisgender men.

Across all outcomes, the six highest predicted mental health concerns and the six lowest predicted positive mental health scores were all within strata of TNB students of color. These strata predominantly included nonbinary AFAB students (17 of 24 strata), biracial Black and Indigenous students (20 of 24 strata), and first generation college students (18 of 24 strata). Estimates for suicide attempts were highest among a combination of strata representing transgender men, nonbinary AFAB students and nonbinary AMAB students. Estimates of positive mental health were lowest among strata with biracial Black and Indigenous students and monoracial Asian and Arab participants (Table 3.3).

The lowest predicted mental health concerns and highest predicted positive mental health were all among strata of cisgender students. A majority of these were strata with monoracial students (21 of 24 strata), cisgender men (18 of 24 strata), and continuing generation students (20 of 24). Strata with cisgender women and cisgender men were represented equally in strata with the highest positive mental health and lowest suicide attempts. Across most strata with the lowest estimates for mental health concerns, most (15 of 18) were strata with monoracial White, Asian, Middle Eastern, or Hispanic/Latine students. However, strata with the highest positive mental health contained predominantly monoracial Black or Native Hawaiian/Pacific Islander students (5 of 6 strata; Table 3.4).

Table 3.3. Highest risk strata across outcomes

Stratum	Predicted Outcome	CI Upper	CI Lower
Depression Symptoms			
NB/AF AI+WH F	15.7	16.5	14.9
NB/AF BL+HL F	15.7	16.5	14.9
NB/AF BL+WH F	15.6	16.4	14.9
NB/AF MULTI F	15.6	16.2	14.9
NB/AF BL+HL C	15.0	15.8	14.2
NB/AF ARAB F	15.0	15.8	14.3
Suicidal Ideation			
NB/AF AI+WH F	47.9%	53.9%	41.2%
NB/AF BL+WH F	46.0%	51.9%	40.6%
NB/AF MULTI F	45.9%	51.0%	40.9%
NB/AF AI+WH C	45.5%	51.4%	39.3%
NB/AM AI+WH A	45.5%	53.5%	37.9%
TM MULTI F	43.5%	50.1%	37.1%
Suicide Attempts			
NB/AF AI+WH F	10.8%	15.1%	7.8%
TM AI+WH A	10.7%	17.2%	6.1%
TM MULTI F	10.0%	13.6%	7.3%
NB/AF AI+WH C	9.6%	13.4%	6.8%
NB/AM AI+WH A	9.4%	15.3%	5.4%
TM BLACK F	9.3%	12.4%	6.9%
Positive Mental Health			
NB/AF BL+WH F	35.5	36.5	34.5
NB/AF AI+WH F	35.6	36.7	34.6
NB/AF ASIAN F	35.7	36.5	34.9
NB/AM ASIAN F	36.0	37.0	34.9
NB/AF ARAB F	36.0	37.0	35.0
NB/AF MULTI F	36.0	37.0	35.1

Table 3.3 Note: Acronyms: AMAB= Assigned Male at Birth; AFAB= Assigned Female at Birth. The stratum column represents intersectional strata identification. The first set of letters represent gender identity: TW= Transgender Women, TM= Transgender Men, NB/AM=

Nonbinary, AMAB, NB/AF= Nonbinary, AFAB, CW= Cisgender Women, CM= Cisgender Men. The second set of letters represent race/ethnicity: AI/AN= American Indian/Alaskan Native, AI+WH= American Indian/Alaskan Native and White, ASIAN=Asian, AS+WH= Asian and White, BLACK= Black or African American, BL+HL= Black and Hispanic or Latine, BL+WH= Black or African American and White, HS/LE= Hispanic or Latine, HL+WH= Hispanic or Latine and White, ARAB= Arab, AR+WH=Arab and White, MULTI= Multiracial or Monoracial of another race/ethnicity, NH/PI= Native Hawaiian/Pacific Islander, WHITE= White. The final letter represents parent education: C= Continuing generation students, F= First generation college students, A= All (Combined across all levels of parent education).

Table 3.4. Lowest risk strata across outcomes

Stratum	Predicted Outcome	CI Upper	CI Lower
Depression Symptoms			
CM BLACK C	7.3	7.8	6.9
CM WHITE C	7.5	7.8	7.2
CM ASIAN C	7.5	7.9	7.2
CM AS+WH C	7.6	8.2	7.0
CM BLACK F	7.6	8.1	7.2
CM HS/LE C	7.9	8.3	7.5
Suicidal Ideation			
CM ASIAN C	8.9%	10.0%	7.8%
CM ASIAN F	9.2%	10.6%	8.1%
CM ARAB C	9.5%	11.6%	7.8%
CM AI/AN C	9.8%	13.3%	7.1%
CM HS/LE C	9.8%	11.4%	8.5%
CM ARAB F	9.9%	12.3%	8.2%
Suicide Attempts			
CM WHITE C	0.9%	1.0%	0.8%
CM ARAB C	0.9%	1.3%	0.6%
CM AR+WH C	0.9%	1.7%	0.5%
CW WHITE C	0.9%	1.0%	0.9%
CW AR+WH C	0.9%	1.8%	0.5%
CW ARAB C	0.9%	1.4%	0.6%
Positive Mental Health			
CM BLACK F	44.5	45.1	43.8
CM BLACK C	44.5	45.0	43.8
CM NH/PI C	44.4	45.9	42.9
CW NH/PI C	43.9	45.4	42.4
CW WHITE C	43.8	44.2	43.4
CW BLACK C	43.8	44.3	43.3

Table 3.4 Note: Acronyms: AMAB= Assigned Male at Birth; AFAB= Assigned Female at Birth. The stratum column represents intersectional strata identification. The first set of letters represent gender identity: TW= Transgender Women, TM= Transgender Men, NB/AM=

Nonbinary, AMAB, NB/AF= Nonbinary, AFAB, CW= Cisgender Women, CM= Cisgender Men. The second set of letters represent race/ethnicity: AI/AN= American Indian/Alaskan Native, AI+WH= American Indian/Alaskan Native and White, ASIAN=Asian, AS+WH= Asian and White, BLACK= Black or African American, BL+HL= Black and Hispanic or Latine, BL+WH= Black or African American and White, HS/LE= Hispanic or Latine, HL+WH= Hispanic or Latine and White, ARAB= Arab, AR+WH=Arab and White, MULTI= Multiracial or Monoracial of another race/ethnicity, NH/PI= Native Hawaiian/Pacific Islander, WHITE= White. The final letter represents parent education: C= Continuing generation students, F= First generation college students, A= All (Combined across all levels of parent education.)

Patterns across gender identities. Across all intersectional models, predicted outcomes were generally poorer for TNB students compared to cisgender students, regardless of race/ethnicity or SES. These differences were statistically significant across the majority of TNB strata compared to cisgender strata when modeling suicide attempts and depression symptoms, and for nearly all strata when modeling suicidal ideation and positive mental health. For instance, the highest estimate of depression symptomatology within a stratum of cisgender students was 11.5 (CI: 11.0-12.0), while the highest depression score among strata of TNB students was 15.7 (CI: 16.5-14.9). Additionally, across 59 strata with TNB students, at least 43 (73%) had depression scores that were statistically significantly higher than those of all cisgender students (Figure 3.1).

Patterns across gender identities. Among cisgender students, those with the highest predicted mental health concerns and lowest predicted positive mental health were

predominantly first generation biracial Black and Indigenous cisgender women. Among TNB students, strata with the lowest predicted mental health concerns and highest predicted scores for positive mental health were predominantly transgender women, monoracial students, and continuing generation students, or strata where parent education was not defined.

Within strata of the same gender identity, the variation in depression symptomatology scores was small (between 2 and 3 points on the PHQ-9; Figure 3.1). Ranges of the predicted prevalence of suicidal ideation within strata of the same gender identity were large, between 6 to 17 percentage points (Figure 3.2). The range of predicted prevalence of suicidal attempts were between 2.5 to 8 percentage points within strata of the same gender identity (Figure 3.3). The ranges of predicted estimates of positive mental health scores within strata of the same gender identity were small, between 2 and 3 points (Figure 3.4).

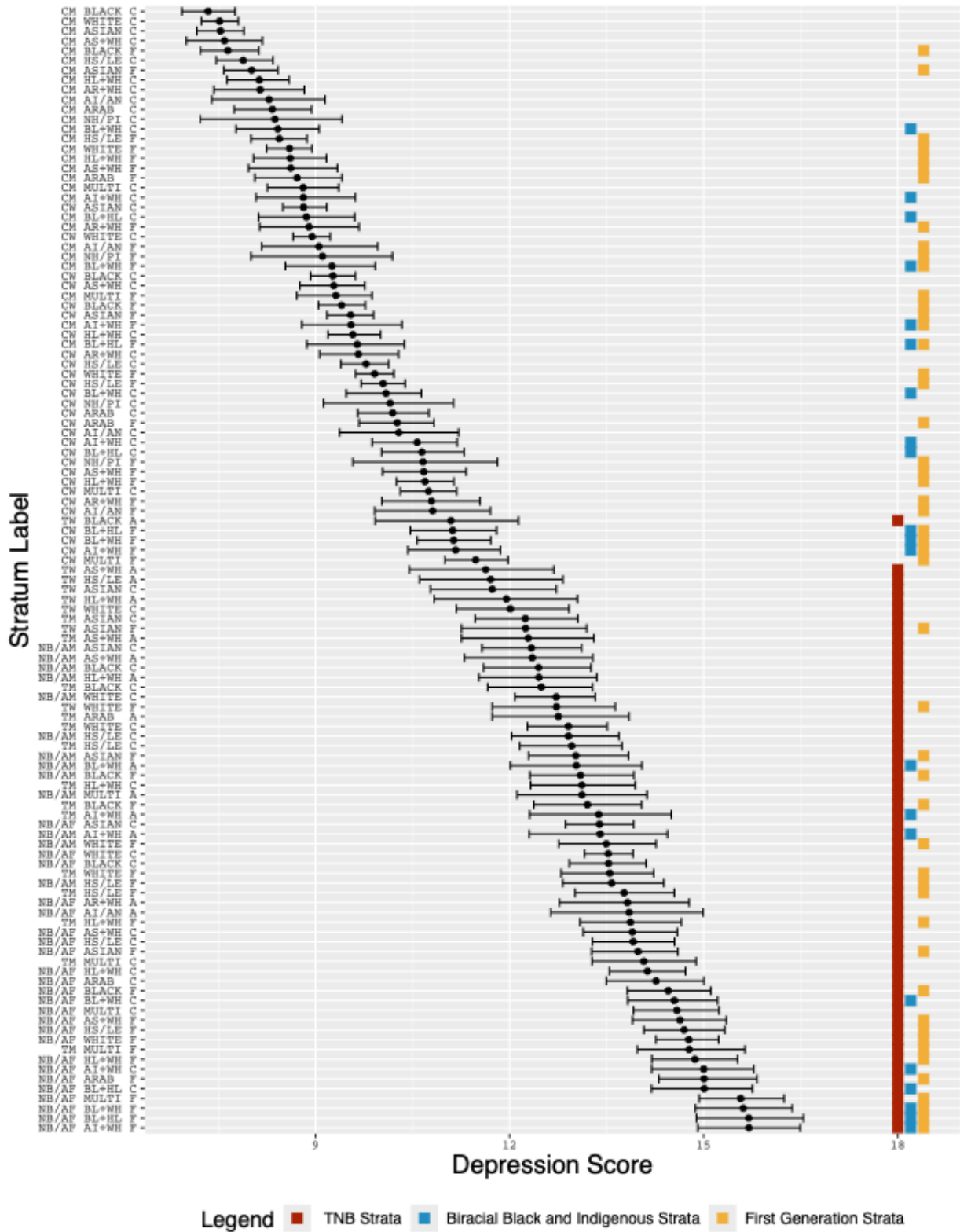


Figure 3.1. Precision-Weighted Predicted Estimates of Depression Symptoms by Strata Defined by Gender Identity, Race/Ethnicity, and Parent Education

Figure 3.1 Note: Acronyms: AMAB= Assigned Male at Birth; AFAB= Assigned Female at Birth, TNB= Transgender and/or Nonbinary. The stratum columns intersectional strata identification. The first set of letters represent gender identity: TW= Transgender Women, TM= Transgender Men, NB/AM= Nonbinary, AMAB, NB/AF= Nonbinary, AFAB, CW= Cisgender Women, CM= Cisgender Men. The second set of letters represent race/ethnicity: AI/AN= American Indian/Alaskan Native, AI+WH= American Indian/Alaskan Native and White, ASIAN=Asian, AS+WH= Asian and White, BLACK= Black or African American, BL+HL= Black and Hispanic or Latine, BL+WH= Black or African American and White, HS/LE= Hispanic or Latine, HL+WH= Hispanic or Latine and White, ARAB= Arab, AR+WH=Arab and White, MULTI= Multiracial or Monoracial of another race/ethnicity, NH/PI= Native Hawaiian/Pacific Islander, WHITE= White. The final letter represents parent education: C= Continuing generation students, F= First generation college students, A= All (Combined across all levels of parent education).

Figure 3.2 Note: Acronyms: AMAB= Assigned Male at Birth; AFAB= Assigned Female at Birth, TNB= Transgender and/or Nonbinary. The stratum columns intersectional strata identification. The first set of letters represent gender identity: TW= Transgender Women, TM= Transgender Men, NB/AM= Nonbinary, AMAB, NB/AF= Nonbinary, AFAB, CW= Cisgender Women, CM= Cisgender Men. The second set of letters represent race/ethnicity: AI/AN= American Indian/Alaskan Native, AI+WH= American Indian/Alaskan Native and White, ASIAN=Asian, AS+WH= Asian and White, BLACK= Black or African American, BL+HL= Black and Hispanic or Latine, BL+WH= Black or African American and White, HS/LE= Hispanic or Latine, HL+WH= Hispanic or Latine and White, ARAB= Arab, AR+WH=Arab and White, MULTI= Multiracial or Monoracial of another race/ethnicity, NH/PI= Native Hawaiian/Pacific Islander, WHITE= White. The final letter represents parent education: C= Continuing generation students, F= First generation college students, A= All (Combined across all levels of parent education).

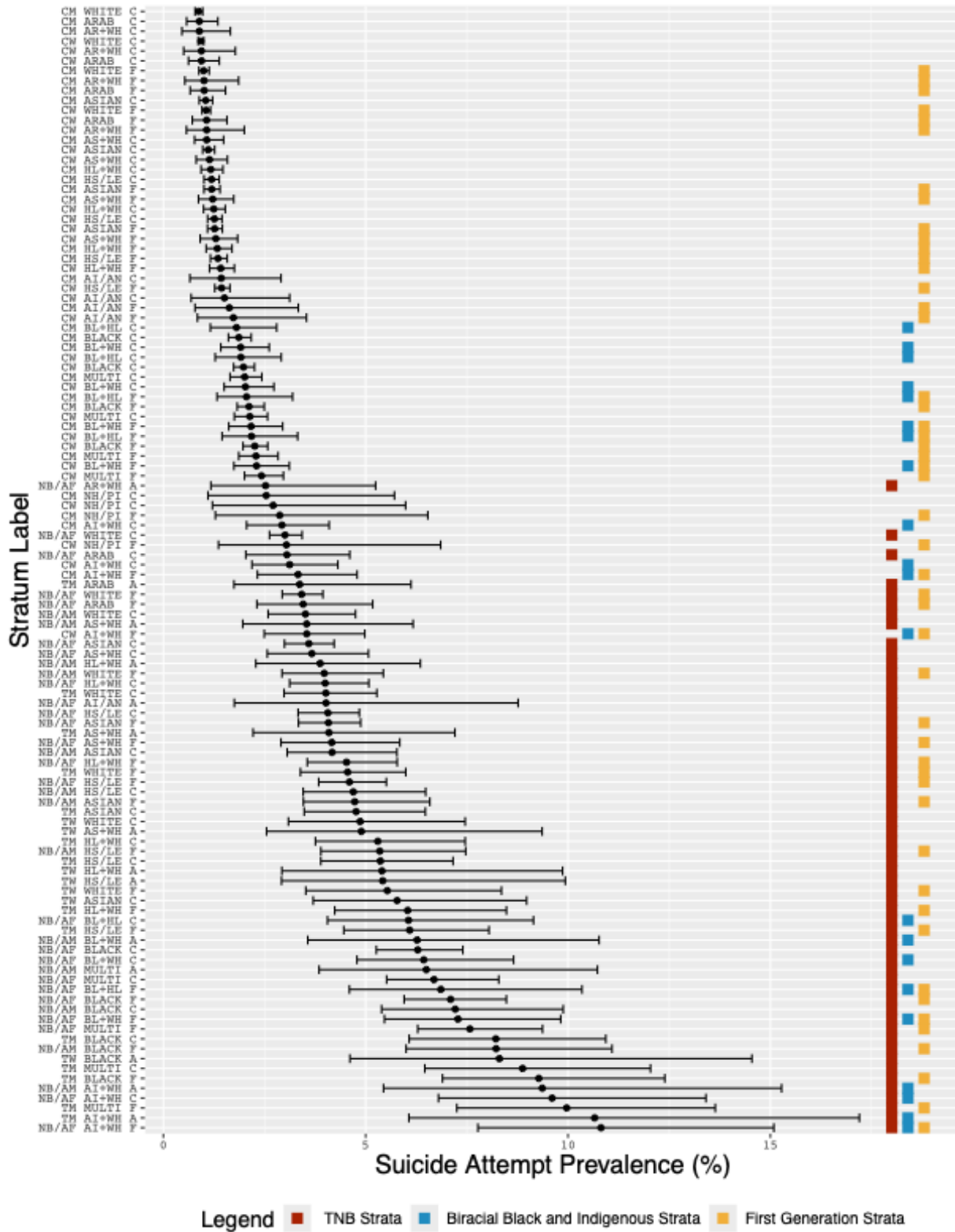


Figure 3.3. Precision-Weighted Predicted Prevalence of Suicide Attempts by Strata Defined by Gender Identity, Race/Ethnicity, and Parent Education

Figure 3.3 Note: Acronyms: AMAB= Assigned Male at Birth; AFAB= Assigned Female at Birth, TNB= Transgender and/or Nonbinary. The stratum columns intersectional strata identification. The first set of letters represent gender identity: TW= Transgender Women, TM= Transgender Men, NB/AM= Nonbinary, AMAB, NB/AF= Nonbinary, AFAB, CW= Cisgender Women, CM= Cisgender Men. The second set of letters represent race/ethnicity: AI/AN= American Indian/Alaskan Native, AI+WH= American Indian/Alaskan Native and White, ASIAN=Asian, AS+WH= Asian and White, BLACK= Black or African American, BL+HL= Black and Hispanic or Latine, BL+WH= Black or African American and White, HS/LE= Hispanic or Latine, HL+WH= Hispanic or Latine and White, ARAB= Arab, AR+WH=Arab and White, MULTI= Multiracial or Monoracial of another race/ethnicity, NH/PI= Native Hawaiian/Pacific Islander, WHITE= White. The final letter represents parent education: C= Continuing generation students, F= First generation college students, A= All (Combined across all levels of parent education).

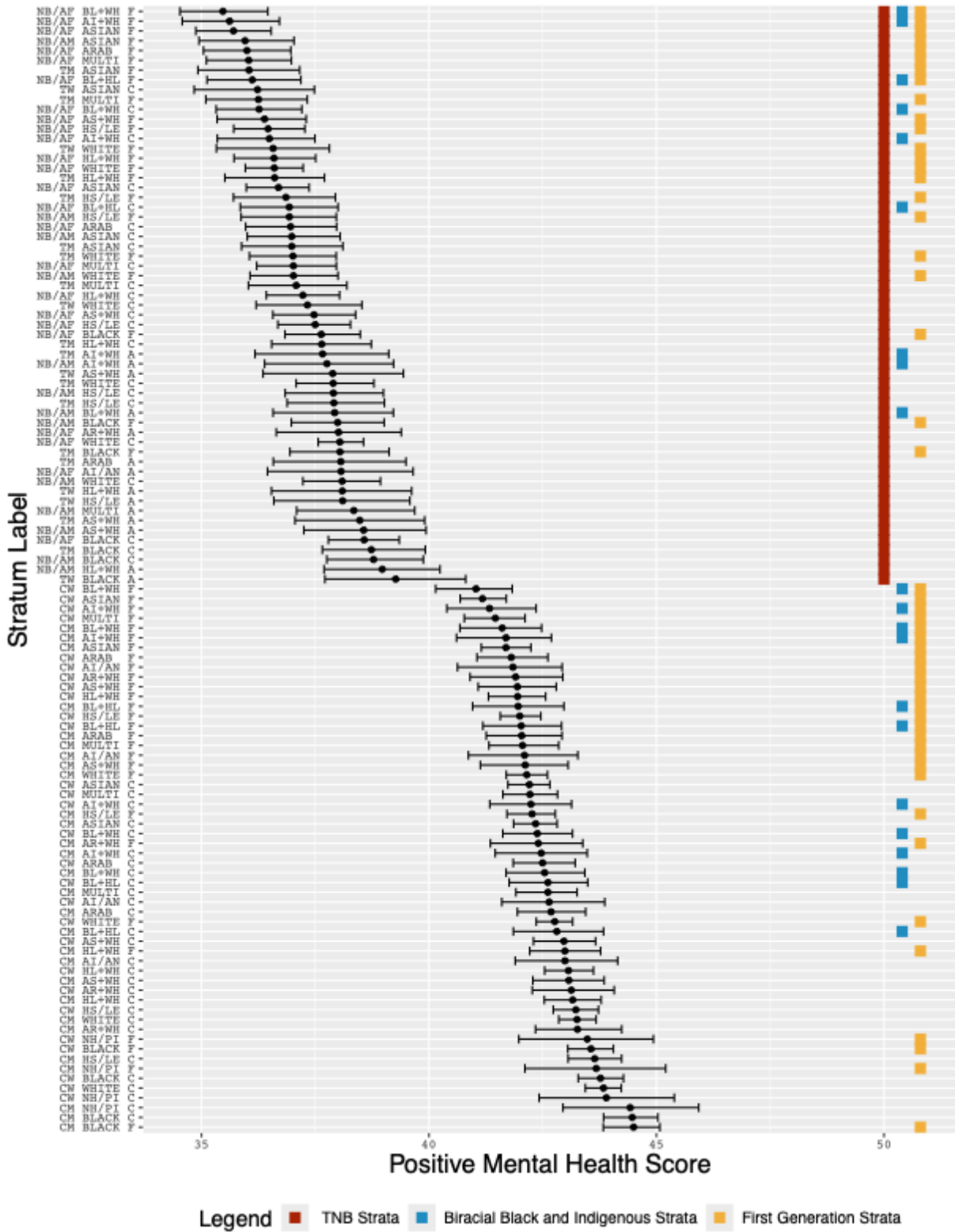


Figure 3.4. Precision-Weighted Predicted Estimates of Positive Mental Health by Strata Defined by Gender Identity, Race/Ethnicity, and Parent Education

Figure 3.4 Note: Acronyms: AMAB= Assigned Male at Birth; AFAB= Assigned Female at Birth, TNB= Transgender and/or Nonbinary. The stratum columns intersectional strata identification. The first set of letters represent gender identity: TW= Transgender Women, TM= Transgender Men, NB/AM= Nonbinary, AMAB, NB/AF= Nonbinary, AFAB, CW= Cisgender Women, CM= Cisgender Men. The second set of letters represent race/ethnicity: AI/AN= American Indian/Alaskan Native, AI+WH= American Indian/Alaskan Native and White, ASIAN=Asian, AS+WH= Asian and White, BLACK= Black or African American, BL+HL= Black and Hispanic or Latine, BL+WH= Black or African American and White, HS/LE= Hispanic or Latine, HL+WH= Hispanic or Latine and White, ARAB= Arab, AR+WH=Arab and White, MULTI= Multiracial or Monoracial of another race/ethnicity, NH?PI= Native Hawaiian/Pacific Islander, WHITE= White. The final letter represents parent education: C= Continuing generation students, F= First generation college students, A= All (Combined across all levels of parent education).

Discussion

Mental health disparities among TNB populations compared to cisgender populations are sizable and of grave public health concern.¹⁷⁶ This study is the first to examine intersectional disparities in mental health outcomes by gender identity, race/ethnicity, and SES. It thus extends our knowledge of the patterning of mental health outcomes among multiply marginalized college students and identifies potential target areas for interventions for college student mental health. We showed substantial differences in mental health outcomes across social positions defined by gender identity, race/ethnicity, and SES. Regarding intersectional effects, the VPCs from model

1 showed between 13.6-14.7% of the total outcome variance was due to between-stratum differences. When compared to the VPCs for model 3, this indicates that most of the variation in the outcomes among college students was due to differences between individuals versus between social positions defined by gender identity, race/ethnicity, and SES. PCV estimates from model 3 showed nearly all the between-stratum variation was due to additive effects of gender identity, race/ethnicity, and SES.

TNB students, biracial Black and/or Indigenous students, multiracial or monoracial students of another racial group, and first generation students consistently reported poorer outcomes compared to their respective reference groups. Precision-weighted predicted estimates and prevalences of outcomes had wide ranges across intersectional strata defined by gender identity, race/ethnicity, and SES. Strata of first generation TNB biracial and Black and/or Indigenous participants had the highest predicted estimates and prevalences for mental health concerns, and the lowest predicted estimates of positive mental health. Similarly, strata of continuing generation monoracial (mostly non-Black and non-Indigenous) cisgender students were more likely to have the lowest estimates and prevalence of mental health concerns. Within cisgender students, strata with first generation biracial Black and Indigenous cisgender women generally had poorer outcomes. Overall, results demonstrate that determinants of health differentially impacting those based on gender identity, race/ethnicity, and SES (e.g., structural and interpersonal cissexism, racism, and classism) play a substantial role in the heterogeneity of mental health outcomes.

The percentage of TNB students in this sample was notably higher than previously reported in HMS at 5.8% (with a sizable portion [4.2%] of nonbinary AFAB participants) but

similar to other national college studies conducted in 2020 and later.⁷ For comparison, in HMS in years 2015-2017, 2.1% of students were TNB.⁶ College attendance and young adulthood are periods when young adults have increased time, agency, and exposure to new communities, which may shape their gender identity development.^{52,177,178} Recent increases in representation of TNB individuals in online media¹⁷⁹ and increased use of online media platforms¹⁸⁰ may have offered TNB college students in 2020-2022 more opportunities to safely engage in gender identity development prior to attending college than students in 2015-2017. Further, recent increases in awareness of TNB students in colleges and universities may have increased comfort in identifying as TNB on a college survey. These reasons may explain the recent increase in the proportion of TNB college students in HMS.

General Patterns of Inequity

We observed poorer mental health outcomes among TNB college students, and these findings are corroborated by existing studies.^{6,7,133} Within a college setting, these disparities may be caused by structural discrimination, such as reduced access to gender affirming health care, lack of TNB cultural competence among faculty and staff, exclusion of TNB students from nondiscrimination policies and TNB-exclusionary name change policies. TNB students can also experience frequent microaggressions, such as misgendering or deadnaming (i.e., using someone's birth name rather than their affirmed name), and increased bullying and violence, all of which are associated with mental health concerns.¹⁸¹⁻¹⁸³

Biracial Black and Indigenous students, and multiracial or monoracial students of another race also reported poorer outcomes compared to students in other race/ethnicity groups. Other studies have shown differences in mental health outcomes by race/ethnicity, with multiracial

students experiencing poorer outcomes.^{127,135,184–186} Disparities in mental health among multiracial youth and young adults compared to monoracial individuals have also been documented.¹⁶⁴ However, to our knowledge, no national studies of college mental health have disaggregated groups of multiracial students across experiences of race and ethnicity. According to an intersectional framework, biracial Black and Indigenous students may experience poorer outcomes than monoracial or non-Black, non-Indigenous peers due to the compounding impacts of anti-Black racism, anti-Indigenous racism, and monoracism (racism targeted at multiracial individuals in societies that privilege people with monoracial identities over people with multiracial identities¹⁶⁴). Creating “third spaces” for multiracial students on college campuses may provide social support and reduce mental health disparities.¹⁸⁷ The concept of third spaces comes from the existence of discrete spaces for discrete cultures.¹⁸⁸ For example, there may be distinct spaces in colleges for White students and for Black students to experience shared culture, but rarely is there a third space for biracial Black and White students whose heritage includes both Black and White culture. As a result, these students may feel isolated, which contributes to negative mental health outcomes. Institutional support for communal or therapeutic spaces for multiracial students of similar heritage may reduce mental health disparities among multiracial students.

Results among monoracial Black and monoracial Asian participants were mixed across mental health outcomes. In the prior literature, some studies’ findings aligned with ours, while others differed. These inconsistencies may in part be due to differences in study design. For example, some prior studies compared Black or Asian students to all non-Black or all non-Asian students, vs. comparing to White students. Some studies used diagnosis by a healthcare provider

as an outcome compared to population-level symptom prevalence, and some studies did not control for age or gender.^{135,184,185}

SES and age were associated with poorer outcomes, consistent with the literature.^{138,142,171} Mechanisms for differences in mental health outcomes by parent education, as a proxy for SES, may include current financial burdens and/or the impacts of financial burdens in childhood, including parental conflict and parental mental health. Interventions to support first generation students can provide resources to alleviate student's current financial burdens and support students in acclimating to college campuses.¹⁸⁹ For example, intensive academic enrichment programs beginning prior to the first year of college attendance and continuing on through the first year can provide students with knowledge and mentorship relationships needed to navigate college systems independently and proactively. Such programs have been shown to benefit student mental health.^{190,191}

Overall, while the general trends observed in this study are not unexpected, the magnitude of prevalence and severity of mental health outcomes observed overall, and the magnitude of the disparities observed could in part be attributed to contextual factors not included in this analysis. For instance, mental health outcomes among college students and among marginalized groups were higher following COVID-19 pandemic lock-downs.^{192,193} Increased instances and awareness around police brutality targeting Black Americans, including the death George Floyd, may have also contributed to high prevalences of mental health concerns for all students and widening disparities among Black students.¹⁹⁴ Increases in anti-TNB legislation during this time period also may have widened disparities among TNB and cisgender students.^{124,195} While these temporally relevant factors are important to consider when

contextualizing the magnitude of observed outcomes, based on prior research, the patterns observed in this study likely reflect the current experiences and needs of relevant subpopulations. Additionally, while the magnitude of the mental health impacts of the COVID-19 lockdown among colleges students may be declining, sustained police brutality against Black Americans and increased implementation of anti-TNB policies is expected to continue. These structural determinants can be anticipated to continue to contribute to mental health disparities among college students and must be addressed.

Intersectional Effects

Our results highlight the importance of conducting high dimensional intersectional analyses, which allowed us to identify particularly high mental health concerns among biracial Black and Indigenous AFAB nonbinary students with low SES. This would not have been possible when examining disparities solely by race/ethnicity, gender identity, or SES, or with only a combination of two of these dimensions. Additionally, our result highlights the importance of conducting intersectional analyses regardless of the magnitude of intersectional effects (e.g., a low VPC or high PCV, as is the case here). While intersectional effects above and beyond additive effects may be low in this study, conducting intersectional MAIHDA allowed our analyses to be well powered enough to discern substantial differences in predicted outcomes among small, multiply marginalized populations. MAIHDA thus further enhances our ability to quantitatively expand the narratives around the experiences of understudied groups.

Predicted Outcomes

True to our hypothesis, multiply marginalized TNB students, especially first generation biracial Black and Indigenous nonbinary AFAB students, had poorer outcomes compared to

continuing generation cisgender White students. To the best of our knowledge, this is the first study to quantitatively assess mental health outcomes among this population at the national level. One prior study has examined interactions across gender (cisgender men, cisgender women, all TNB participants) and race/ethnicity (White vs. all other participants) and did not find significant differences in suicidal ideation or mental health treatment.¹⁵⁰ However, by aggregating all participants of color into a single subgroup, that study may have obfuscated bi-directional relationships among participants of color, as demonstrated within the present study. Biracial Black and Indigenous nonbinary AFAB students may be more likely to experience poor mental health outcomes resulting from anti-Black and anti-Indigenous discrimination, combined with the stressors of monoracism, and of living in a culture prioritizing binary genders based on assigned sex.

The phenomenon of interlocking stressors resulting from being both multiracial and nonbinary in a monoracial, bigendered culture is also known as *border identity stress*.^{196,197} In a college setting, border identity stress may manifest as exclusion of multiracial nonbinary students from spaces for TNB students due to their nonbinary identity, and from spaces for students of color for being multiracial.^{198,199} TNB students of color may also experience exclusion in spaces for TNB students, which may be White-dominated, and simultaneously are more likely to experience exclusion in spaces for students of color, which may be dominated by cisgender students.²⁰⁰⁻²⁰²

Differences Across and Within Gender Modalities

Examining predicted outcomes across social positions illustrated the magnitude of the differences in mental health outcomes between TNB and cisgender participants. For example, as

shown in Figures 1-4, when plotting most outcomes, there was a distinct disconnect between strata of cisgender participants and those of TNB participants. While determining characteristics of social position that most drive outcome variation is not a goal of intersectional research,³⁶ or of this study, the magnitude of the impact of gender identity on intersectional strata in this sample was unmistakable. This indicates an urgent need for interventions for TNB student mental health that are accessible to all TNB students, across race/ethnicity and SES. While counseling guides exist for counselors serving TNB college students,²⁰³ no empirical studies have tested the effectiveness of psychosocial or education-based mental health interventions for TNB college students. Interventions could include institutional support for community-building among TNB students, or TNB counseling support groups, as well as interventions to reduce stigmatization of TNB students,²⁰⁴ such as trainings in TNB-inclusivity for faculty and staff.

Within intersectional strata of TNB participants, strata with AFAB nonbinary participants reported the highest mental health concerns, while transgender women were highly represented in strata with the lowest mental health concerns. However, most strata of biracial transgender women, transgender men, and AMAB nonbinary students were too small to report in intersectional analyses, and those that could be analyzed were among the smallest strata and may thus be subject to slight underestimation.¹⁵³ As a result, the patterning observed here where mental health outcomes were poorest among nonbinary AFAB students may not reflect the distribution of outcomes in a larger, more diverse sample. There may be differences in experiences of monoracial TNB participants and biracial transgender women, transgender men, and AMAB nonbinary people, particularly those who are Black and Indigenous, such that poorer outcomes may be equally distributed across TNB gender identities.

Strengths and Limitations

While HMS includes a broad range of campuses, including a sizable number of community colleges, a college sample may exclude larger numbers of TNB people, racialized people, and low-SES people. Regarding representation, we excluded intersex students due to small sample sizes, which is an additional limitation of this study. While outcomes were measured using a validated screening tool, depression symptoms do not constitute clinical diagnoses and may be subject to respondent bias as they were based on self-report. Additionally, with a cross-sectional study, we cannot draw causal inferences regarding the origins of mental health disparities. While HMS is a large and diverse study of campuses and college students, campuses and students elect to participate in HMS in a way that is likely not random. HMS also shows a response rate expected in online surveys of ~24% and past studies of non-respondents in HMS have shown non-respondents were less likely to report poor mental health outcomes. However, this study did not examine this relationship using an intersectional framework and differential underreporting in outcomes across intersectional strata may be present.²⁰⁵ Lastly, we did not account for institutional-level clustering, as cross-classification within MAIHDA models is an important and emerging area of research.²⁰⁶

Despite these limitations, this study has many strengths. To our knowledge, this is the first study to apply quantitative intersectional methods to examine disparities in TNB mental health across experiences of race/ethnicity and SES. By using MAIHDA, we were able to calculate precision-weighted predicted outcome values across highly dimensional intersectional strata, enabling us to characterize the population patterning in mental health outcomes across race/ethnicity, gender identity, and SES. Additionally, while stratum-specific estimates for small

strata may be slightly biased, the direction of bias yields more conservative estimates of these health disparities relative to other methods. This indicated we have a higher degree of confidence that the magnitude of the disparities reported are at least as large what is reported, further justifying the rationale for interventions targeting multiply marginalized TNB students.

Disaggregating data across experiences of race among multiracial students enabled us to discern differences in mental health outcomes among subgroups of multiracial students, which are rarely analyzed in the mental health literature.¹⁶⁴ This study also utilized one of the largest known studies of detailed mental health outcomes among TNB college students. A national survey, HMS contains data from a diverse sample of nearly 400 campuses from across the US, which strengthens the generalizability of our findings among college students.

Future Directions

Future directions center around the importance of improving college student mental health.

College administrators and researchers should examine how resources and policies are structured to support primary, secondary, and tertiary prevention of poor mental health outcomes among all students, especially TNB students and students experiencing border identity stress. Future research into primary prevention efforts should examine the impacts of college policy on mental health, particularly policies impacting TNB and multiracial Black and Indigenous students.

Further quantitative and qualitative research is needed to identify specific unmet needs of first generation biracial Black and Indigenous TNB students and to design and test interventions for those experiencing border identity stressors in college settings. Further research on the needs and experiences of intersex students, regardless of gender identity, is also needed. Future studies of mental health among multiracial participants should consider disaggregating data across specific

experiences of race, as substantial variance in outcomes across subgroups of multiracial students may bias results when groups are aggregated. Intersectional studies of TNB college student mental health should elucidate the needs and experiences of biracial Black and Indigenous transgender women, transgender men, and AMAB nonbinary students. Longitudinal studies on TNB student experiences across race and ethnicity can also provide essential data for characterizing trajectories of TNB mental health throughout college, independent of the impacts of COVID-19, and identify targets for intervention. Overall, this study provides a novel contribution to the literature regarding the magnitude and distribution of mental health outcomes among intersectional subgroups defined by gender identity, race/ethnicity, and SES.

Chapter 4: Measurement of a Transgender and Nonbinary-Supportive Policy

Environment: A Latent Class Analysis of Institutional Policies across 311 US Colleges

Introduction

College students report high rates of mental health concerns, including depression, suicidality, anxiety, and other related outcomes. A meta-analysis of four-year universities found one in four students experienced depression and 14% reported suicide-related outcomes. Additionally, an international study conducted by the World Health Organization found more than one in three students screened positive for at least one common DSM-IV diagnosis in the past twelve months.^{207,208} Transgender and/or nonbinary (TNB) students in particular experience a substantial burden of mental health concerns in comparison to their cisgender peers.¹⁻⁶ A national United States (US) study of TNB students found a 58% prevalence of current depression, 35% prevalence of past-year suicidal ideation, and 3% prevalence of past-year suicide attempts, all notably higher than rates among cisgender students and of high public health concern (28% depression, 10% suicidal ideation, and 0.8% suicide attempts).⁶

The Gender Minority Stress Model and Minority Stress Theory posit that mental health disparities among TNB populations manifest due to external and internal stressors and are rooted in systemic oppression.^{14,16} External stressors can include rejection and discrimination from friends and family, experience of violence or hate crimes, or forms of structural cisgenderism (systemic restrictions on TNB people stemming from discriminatory cultural norms and policies, or the absence of equitable policies).²⁰⁹ Internal stressors stem from external stressors and include internalized transphobia and gender identity concealment.^{14,17} These stressors can result

in psychological distress and mental health inequities through multiple mechanisms, and are especially concerning given that TNB college students are a growing population in institutions of higher education.^{8,161}

More than 19 million US youth and young adults are enrolled in post-secondary education, and at least 2.1% (approximately 400,000) are TNB.^{6,158} Consequently, systematically addressing disparities in TNB mental health across colleges is crucial. College environments present distinct opportunities to support TNB student mental health through interventions in the form of protective college policies. In addition to preventing the extent of discrimination experienced by TNB students, supportive college environments can provide TNB students with opportunities for gender exploration and affirmation.^{177,210} These opportunities are particularly important for students entering into college environments from unsupportive family environments, who are more likely to experience negative mental health outcomes.^{25,211,212} These TNB students and other TNB students exploring their gender for the first time might elect to use a different name or pronouns in college and/or to express their gender presentation in ways that felt unsafe at home.¹⁷⁷ Providing a supportive college environment for TNB students is therefore crucial to promoting healthy gender identity development and may be essential to mitigating mental health outcomes.

While fostering a supportive environment has been shown to be key to improving mental health outcomes for TNB youth and young adults,²¹³⁻²¹⁵ a number of studies have highlighted ways in which institutions of higher education could improve their supportiveness of TNB students. In particular, studies of TNB college students consistently report experiences where the absence of supportive policies caused distress and/or where TNB students have called for institutions to enact more supportive policies. Examples of such policies include: 1) accessible

name change and gender marker change policies; 2) readily available all-gender restrooms, showers, and lockers; 3) TNB competent teaching in topics related to sex or gender; 4) institutional support for lesbian, gay, bisexual, transgender, and queer (LGBTQ) student organizations; 5) TNB-inclusive content regarding gender in curricula, 6) adoption of TNB-inclusivity practices for faculty and staff, including college health and counseling centers; 7) adopting institutional nondiscrimination policies that are inclusive of gender identity and expression; and 8) TNB-inclusive housing policies.^{177,216–223} However, despite these policy recommendations and previous documentation of poor mental health outcomes for TNB students in the literature, no studies have quantified associations between the presence or absence of TNB-supportive policies and TNB student mental health and related outcomes.

Although limited studies have focused on student experiences related to TNB-supportive policies, these studies do not capture the effects of an institution adopting or failing to adopt a policy on individual-level student outcomes. For example, one multi-institution study of 133 TNB students found that nearly a quarter (23.6%) experienced moderate to extreme fear of being harassed in bathrooms when they did not have access to all-gender bathrooms. This fear was associated with a modest increase in depression and anxiety symptoms among TNB students.²²⁴ Another study of 2,325 TNB students found that being denied access to gender-affirming restrooms, locker rooms, or housing was associated with increased risk of suicide attempts.²²⁵ A third study found that an increased knowledge of the presence of TNB-supportive policies at their college was associated with more positive perceptions of campus climate and sense of belonging.²²⁰ While these studies demonstrate the importance of access to and knowledge of resources for TNB mental health, they do not measure or attempt to measure the impacts of the presence or absence of the policies themselves. Modeling these associations is critical to

demonstrate the importance of policy implementation to college administrators, key stakeholders, and potential funders, especially for otherwise cost-prohibitive policies.

Even fewer studies have examined associations between institutional characteristics (e.g., institution type, size, religious affiliation) and TNB-supportive policies, which would enable researchers and administrators to better understand the college environments in which supportive policies are enacted. To our knowledge, only one study has examined these associations. This study created a summary score reflecting student knowledge of TNB-supportive policies and found that four-year institutions, private institutions, and non-religiously affiliated institutions had modest, yet statistically significantly larger summary scores compared to two-year institutions, public institutions, and religiously affiliated institutions, respectively.²²⁰ As colleges vary widely on factors such as their sizes, budgets, surrounding sociopolitical climates, and religious affiliations, researchers and key stakeholders must take these factors into consideration when developing interventions that can be successfully implemented. Further information on the characteristics of institutions that do or do not adopt TNB-supportive policies is needed to provide researchers and key stakeholders with this foundational information for the development of feasible and targeted interventions across different institution types.

Collectively, studies quantitatively examining associations with TNB-supportive policies also share methodological and conceptual limitations regarding the operationalization of TNB-supportive policies. Across studies, there have been two approaches to modeling TNB-supportive college policies: the first approach has been to include variables related to one to two policies as predictors,^{224,225} and the second approach has been to generate a variable counting the number of TNB-supportive policies of which students were aware.²²⁰ These approaches are both limited with regards to causal inference and theoretical conceptualization. Concerning causal

inference, as Goldberg et al. (2018) notes, there are several TNB-supportive policies colleges may enact that could positively impact TNB students.²²⁰ When studies examine only one or two of these policies, there is concern for confounding from unmeasured policies. For example, unmeasured policy A could be a common cause of both measured policy B and TNB student mental health outcomes. (E.g., implementing curricular changes so that there are more classes about TNB people [policy A] may result in greater TNB student enrollment and thus increase the need and desire for an all-gender housing policy [policy B].) If policy A also improves outcomes for TNB students, failing to control for policy A yields confounding when measuring the relationship between policy B and TNB student outcomes.²²⁶

Conceptually, focusing on only one or two policies also does not account for complex, intersecting relationships across TNB-supportive policies and in relation to TNB mental health outcomes. This approach further does not account for a myriad of contextual factors (e.g., institution size, type, political context at the state and local level, religious affiliation) that may shape TNB-supportive policy adoption and student mental health. A social epidemiologic theory, Ecosocial Theory, provides insights for conceptualizing the impacts of TNB-supportive policies on health outcomes. Ecosocial Theory states that disease distribution is in part conditional on not just a single policy, but the political environment and overall context across and within social-ecological levels (e.g., intrapersonal, interpersonal, community, institutional).⁴⁴ In the context of TNB-supportive college policies, this is interpreted to indicate that individual TNB-supportive policies do not exist in a vacuum, but are instead shaped by the presence or absence of other supportive policies, as well as the institutional context in which those policies are implemented. It is critical that research measuring the impact of TNB-supportive policies on TNB students does not measure individual policies in isolation. Instead, researchers must characterize and

assess the impact of the collective *TNB-supportive policy environment*, a collection of policies, shaped by institutional contextual factors.

One study has attempted to collectively model the effects of TNB-supportive policies with a summary score; however, this technique still falls short. Modeling policies as count data assumes the addition of one new supportive policy is associated with the same magnitude of change in TNB student outcomes, regardless of what that policy impacts. For example, using count data, the impact of a nondiscrimination policy would be conceptualized as identical to the impact of creating all-gender housing, which is likely untrue, based on legal research on nondiscrimination policies.²²⁷ In order to appropriately identify TNB-supportive policy environments, statistical techniques, such as latent class analysis (LCA), that take into consideration the campus-level patterning of TNB-supportive policy adoption across a number of policies is warranted. Though outside the scope of this study, further examining associations between different TNB-supportive policy environments and mental health of TNB students is necessary to support policy-based interventions to promote the mental health of TNB students.

To overcome the limitations of prior studies of TNB-supportive policies and correctly characterize the TNB-supportive policy environment, this study employed LCA. In doing so, we further demonstrate the utility of classification-based methods in policy research. Further, by utilizing data obtained directly from institutions versus students, we sought to avoid potential bias based on student's awareness or recollection. In conducting this study, we aimed to 1) address conceptual and methodological research gaps by using LCA to elucidate the of nature of TNB-supportive policy environments, and 2) discern differences in the contexts in which various types of TNB-supportive policy environments are situated in order to support identification of targets for future intervention development. This paper represents the necessary first step in a

broader research agenda examining the relationship between TNB-supportive college policy exposures and student mental health outcomes.

Methods

We collected data on the presence or absence of college policies related to TNB student experiences from 311 US colleges and universities participating in the Healthy Minds Study (HMS) in Fall 2020-Fall 2022. The largest national study of detailed college student mental health outcomes in the US, HMS is covered by a central Institutional Review Board. The present study was determined to be not human subjects research as defined by DHHS regulations or FDA regulations by the Institutional Review Board of the Harvard T.H. Chan School of Public Health.

Institutions

All post-secondary education institutions in the US are eligible to participate in HMS. HMS includes a wide variety of institutions, ranging in size from 1,000 to >20,000 students, and includes community colleges, religious schools, Historically Black Colleges and Universities, and both public and private institutions from across the US.

Data Collection

From October 2023 to September 2024, policy data were collected from three sources: 1) publicly available data on the Campus Pride website²²⁸, 2) publicly available data on institution websites, and 3) phone/email conversations with college administrators. We began by collecting data via the Campus Pride website; if data were not available, we systematically examined an institution's website and other publicly available information. If data were not available at the previous two sources, we contacted administrators/staff.

Campus Pride. Campus Pride conducts an annual survey of the presence or absence of policies impacting LGBTQ students at participating institutions. This survey was developed with a team of national researchers, including the National Consortium of Higher Education LGBT Resource Professionals. For colleges that opt-in, data are published publicly on the Campus Pride website via the Campus Pride Index²²⁹ and updated annually by college officials. Campus Pride also houses the *Campus Pride Trans Policy Clearinghouse*²³⁰, a resource for TNB policies at colleges and universities updated regularly by a leading scholar on TNB issues in higher education.

Institutional Websites. Research staff reviewed institution websites and relevant public-facing insurance documents based on Campus Pride's criteria for college policies (see Table 4.1).

Phone/Email Data Collection. Researchers contacted relevant administrators and/or staff when data were not available via Campus Pride or an institution's website. For example, researchers contacted housing staff in residence life for questions regarding housing policies and contacted the counseling department staff for questions about counseling services. Relevant administrators or staff members (e.g., administrators or staff working in a specific department related to the policy in question) were contacted at least three times via email or phone before attempting to contact a different administrator/or staff member. If relevant administrators or staff members did not respond or could not be identified for a specific policy at a particular institution, researchers contacted admissions offices for more information. Researchers asked administrators and staff questions based on Campus Pride's criteria for the policies of interest. For schools in Texas or Florida where bans on DEI initiatives²³¹ were passed into law for post-secondary education during policy data collection, researchers reached out to schools via phone

as soon as possible to inquire about the nature of college policies prior to the DEI ban. Dates of policy data collection were recorded.

Measures

College Policies. In accordance with Campus Pride’s reporting practices, all policies were recorded as dichotomous (yes/no), with the exception of housing policies, which were recorded as “Not applicable” when on-campus housing was not offered at an institution. Policies for analysis were selected based on a combination of availability via Campus Pride’s database, ease of ability to collect data via institution websites, and perceived relevance to the TNB-supportive policy environment. For example, Campus Pride collects data on whether students have the option to self-identify sexual orientation on admission application or post enrollment forms; however, these data were not included in data collection or analysis due to a combination of difficulty collecting data on post-enrollment forms via institution websites and lack of perceived relevance for characterizing the campus policy environment for TNB students.

Policies analyzed ranged across five domains: 1) Administrative Policies (Nondiscrimination Statement, Name Change Policy), 2) Programmatic Policies (LGBTQ Resource Center, Paid Staff for LGBTQ Students), 3) Housing Policies (Housing for New and Returning Students, Restroom and Showers in Housing Facilities), 4) Counseling Center Policies (Counseling Staff, LGBTQ Counseling Groups), and 5) Insurance Coverage (Hormone Replacement Therapy [HRT] Insurance Coverage, Counseling Insurance Coverage). Housing domain variables were recoded into a single categorical variable due to high correlations with one another and the presence of a “Not applicable” option. All questions used by research staff when reviewing websites or communicating with staff/administrators originated from Campus

Pride's annual survey. Because Campus Pride's survey is proprietary, we are unable to share the specific questions used to assess policy information on institution's websites or via communication with college administrators and staff; however, detailed summary questions are included in Table 4.1.

Table 4.1. Summary of Campus Pride Policy Inquiries

Policy Name	Question
Nondiscrimination Statement	Does the college have a nondiscrimination statement inclusive of gender identity/expression?
Name Change Policy	Does the college offer an accessible name change process for students without legal name change documents?
LGBTQ Resource Center	Does the college have an LGBTQ student resource center?
Paid Staff for LGBTQ Students	Does the college have staff dedicated to support LGBTQ students?
Housing for New Students	Does the college offer gender-inclusive housing for new students?
Housing for Returning Students	Does the college offer gender-inclusive housing for returning students?
Restrooms in Housing Facilities	Does the college offer gender-inclusive restrooms in housing facilities?
Showers in Housing Facilities	Does the college offer gender-inclusive showers in housing facilities?
Trained Counseling Staff	Are counseling staff trained in trans-inclusive counseling practices?
LGBTQ Counseling Groups	Does the college offer counseling groups for LGBTQ students?
Counseling Insurance Coverage	Does the school offer student health insurance that covers counseling for TNB students?
Hormone Replacement Therapy (HRT) Insurance Coverage	Does the school offer student health insurance that covers hormone replacement therapy (HRT) for TNB students?

Table 4.1 Note: Acronyms: LGBTQ= lesbian, gay, bisexual, transgender, queer; TNB= transgender and/or nonbinary

Institutional Characteristics. HMS collects data on institution characteristics, including institution type (based on highest degree offered; Associate’s college, Baccalaureate college, Doctoral-granting institution, and Master’s colleges and universities), size (collected categorically; range <1000 to >20,000), census region and division, and graduation rate. We compiled data from the 2022 Cook Partisan Voting Index (PVI)²³² on the political lean of the

congressional district in which the college resides, and from the Institute of Education Sciences' National Center for Education Statistics²³³ for whether the school had a religious affiliation. The Cook PVI reports the recent average political lean in percentage points away from the national average at the level of the congressional district; for example, a political lean of R+ 6 indicated that in the past two presidential elections, that congressional district had on average 6% more Republican voters in presidential elections than the national average. Religious affiliation for each institution was coded as dichotomous (yes/no).

Missingness. Policy data were considered missing when researchers were unable to collect information on the presence or absence of a policy after a minimum of three contacts to relevant administrators and staff. Across all policies, missingness in a given policy ranged from 1.6%-8.4%. Across all colleges, 24.1% contained missing data for one of the 12 included policies, 11.9% contained missing data for two policies, and 8.0% contained missing data for three or more policies. Colleges with three or more policies missing had greater odds of being in the West South-Central Census Division (Arkansas, Louisiana, Oklahoma, and Texas) compared to the New England Division (Maine, New Hampshire, Vermont, Massachusetts, and Connecticut). Schools with missingness for three or more policies did not differ from schools with two or fewer missing policies across other institutional characteristics.

Latent Class Analysis. We used polytomous latent class models to characterize TNB-supportive policy environments. All statistical analyses were conducted in R (Version 4.4.3, R Foundation for Statistical Computing, Vienna, Austria). To account for minimal missingness in policy variables, we used multiple imputation with chained equations to create 15 imputed datasets under missing-at-random assumptions.^{234,235} We included all institution characteristics in the imputation model. After creating 15 imputed data sets, we conducted a 3-stage LCA²³⁶ to

characterize the distribution of TNB-supportive policies and institutional characteristics within and across different policy environments:

Stage 1. We ran 2-class, 3-class, 4-class, 5-class, and 6-class latent class models with all 15 imputed data sets and examined model fit statistics, class sizes, and posterior probabilities across all 15 sets of latent class models. We examined fit statistics by identifying models with global minimums for a given fit statistics and by employing elbow plots across four indicators: Bayesian Information Criterion (BIC), Sample Adjusted BIC (SABIC), and Akaike Information Criterion (AIC), and log-likelihood maximums.²³⁷⁻²³⁹ Values closer to zero indicate greater model fit, though it is common for indicators to not reach a global minimum, and BIC generally favors a parsimonious, and therefore more interpretable class solution. We also examined log-likelihood ratio tests. We examined average posterior probabilities (the probability of an observation belonging to a certain class) across data sets to assess classification certainty, where values >0.70 indicate high classification certainty.²³⁸ We further examined class stability via class sizes by ensuring all classes were $>10-15\%$ of the institutional sample, and examined interpretability via item-response probabilities (IRP) and class sizes.²³⁷ Based on the information across these measures, we selected the optimal number of classes for our model.

Stage 2. After selecting the number of classes for our model, we added political lean from the Cook PVI as a covariate. Given that political lean is associated with anti-TNB bias, congressional district-level political lean may function as an indicator of regional bias, thereby influencing TNB-supportive policy enactment.²⁴⁰⁻²⁴² At this stage, we examined average posterior probabilities, class sizes, and IRPs again to determine classification certainty and interpretability.

Stage 3. To aggregate model results across data sets, we first accounted for class ordering inconsistencies by calculating and matching the difference between IRPs across imputations. We then pooled IRPs imputed datasets. We determined class membership across all data sets based on pooled posterior probabilities. To better understand the contexts of different classes for the purposes of recommending interventions, we calculated descriptive statistics (means, percentages, and frequencies) for institutional characteristics across class membership determined by pooled posterior probabilities. We also examined statistical associations between class membership and institutional characteristics using bivariate multinomial models within each imputed data set and reported pooled results. We used a combination of pooled-IRPs, descriptive statistics, and pooled multinomial model results to name and describe classes.

Results

Presence of Institutional Characteristics and TNB-Supportive Policies

There was substantial variation in institutional characteristics across the 311 colleges. Regarding institution type, 35.4% (n=110) were Doctorate-granting institutions, 22.2% (n=69) were Associate's colleges, and 16.7% (n=52) were Baccalaureate colleges. While college sizes varied, a notable number of schools (39.0%, n=122) had between 1,000-4,999 students. A majority of institutions (62.4%, n=194) were public schools and 16.1% of schools (n=50) were religiously affiliated. Regarding geographic distribution, most schools came from the following census divisions: South Atlantic Division (South Region; 18.0%, n=56), New England Division (Northeast Region; 17.0%, n=53), Pacific Division (West Region; 13.8%, n=43), and East North Central Division (Midwest Region; 13.2%, n=41). The mean graduation rate across schools was 56.1% (SD=0.22).

Across schools, the majority had a TNB-supportive nondiscrimination policy (82.0%, n=255), name change policy (74.3%, n=231), and TNB-inclusive trained counseling staff (60.5%, n=188). The prevalence of remaining supportive policies ranged from 50.2%-41.5% (counseling insurance coverage, n=156; paid staff for LGBTQ students, n=129, respectively). Regarding housing policies, 47.0% (n=146) had gender-inclusive on-campus residences, restrooms, and showers available for all students, while 11.9% (n=37) offered no gender-inclusive housing and 23.5% (n=73) did not offer any on-campus housing (Table 4.2).

Table 4.2. *Campus Policies and Characteristics of the Healthy Minds Study, 2020-2022*
(*N=311*)

Policy or Characteristic	%	<i>n</i>
TNB-Supportive Policies		
Nondiscrimination	81.99	255
Name Change Policy	74.28	231
LGBTQ Resource Center	43.73	136
Paid Staff for LGBTQ Students	41.48	129
Gender Inclusive Housing		
Gender-Inclusive Housing & Facilities	46.95	146
Gender-Inclusive Facilities and Housing for Returning Students Only	3.54	11
Gender-Inclusive Facilities Only	5.79	18
No Gender-Inclusive Housing or Facilities	11.90	37
No On-Campus Housing	23.47	73
LGBTQ Counseling Groups	45.02	140
Trained Counseling Staff	60.45	188
Counseling Insurance Coverage	50.16	156
HRT Insurance Coverage	47.59	148
Characteristics		
Institution Type		
Associate's Colleges	22.19	69
Baccalaureate Colleges	16.72	52
Doctorate-granting	35.37	110
Master's Colleges and Universities	18.65	58
Special Focus Institutions	7.07	22
Institution Size (Number of students)		
<1000	7.40	23
1,000-4,999	39.23	122
5,000-9,999	21.54	67
10,000-19,999	17.68	55
20,000+	14.15	44
Public School Status	62.38	194
Community College Status	21.54	67
Geographic Region		
Midwest Region, East North Central Division	13.18	41
Midwest Region, West North Central Division	5.47	17
Northeast Region, Middle Atlantic Division	12.22	38

Table 4.2. (Continued)

Northeast Region, New England Division	17.04	53
South Region, East South-Central Division	9.65	30
South Region, South Atlantic Division	18.01	56
South Region, West South-Central Division	3.22	10
West Region, Mountain Division	7.40	23
West Region, Pacific Division	13.83	43
Religious Schools	16.08	50
	<i>M</i>	<i>SD</i>
Graduation Rate	56.1%	0.22
Political Lean (as quartiles)		
R+ 30 - R+11	27.83	86
R+ 11 - D+ 3	26.54	82
D+ 3 - D+ 13	21.68	67
D+ 13 - D+ 39	23.95	74

Latent class Analysis

Stage 1 and 2: Class Enumeration and Model Building. Across all 15 imputed data sets, BIC had a global minimum with a four-class solution 100% of the time. AIC, SABIC, and log-likelihood maximums did not have a global minimum but showed diminishing returns for a class solution larger than four. Log-likelihood ratio tests were significant for all models across datasets and therefore did not play a role in model selection. Average differences in posterior probabilities for a four-class solution were predominantly high ($>.70$), indicating high class separation and further supporting the final selection of a four-class solution. Adding political lean as a covariate to the four-class model yielded class instability and thus was not included in the final models.

Stage 3: Class Descriptions and Associations with Institutional Characteristics. The four classes were named as follows: Moderately Supportive and Moderately-Resourced (class 1),

Least Supportive and Least-Resourced (class 2), Highly Supportive and Moderately-Resourced (class 3), and Highly Supportive and Highly-Resourced (class 4).

Colleges within class 2, which we labeled “Least Supportive and Least-Resourced”, had the lowest IRPs across all TNB-supportive policies. With the exception of administrative policies (Nondiscrimination and Name Change Policies; IRP= 0.72, 0.64, respectively), the highest IRP within this class was 0.31 for TNB-supportive trained counseling staff. Colleges within class 1, which we labeled “Moderately Supportive and Moderately-Resourced”, had moderate IRPs for administrative policies, TNB-supportive trained counseling staff, and gender-inclusive housing and facilities (range: 0.45-0.71), high IRPs for insurance policies (range: 0.98-1.00), but low IRPs for programmatic policies (range: <0.01-0.04). Class 3 was labeled “Highly Supportive and Moderately-Resourced” and had high IRPs for administrative policies and programmatic policies (range: 0.86-0.94), moderate to high levels of counseling policies (range: 0.69-0.88), moderate IRP for gender inclusive housing (0.58), but little to no probability of insurance coverage (range: <0.01-0.08). Class 4 was named “Highly Supportive and Highly-Resourced” and had moderate to high IRPs for all supportive policies (range 0.78-1.00) and almost no probability (0.02) of colleges that offered no on-campus housing (Table 4.3; Figures 4.1-4.3).

Table 4.3. *Item Response Probabilities for TNB-Supportive Policies (IRPs) Across Class Membership*

	Class 1	Class 2	Class 3	Class 4
Nondiscrimination	0.71	0.72	0.94	0.97
Name Change Policy	0.54	0.64	0.98	0.97
LGBTQ Resource Center	0.04	0.02	0.94	0.97
Paid Staff for LGBTQ Students	0.00	0.05	0.86	0.94
Gender Inclusive Housing				
Gender-Inclusive Housing & Facilities	0.45	0.16	0.58	0.87
Gender-Inclusive Facilities and Housing for Returning Students Only	0.04	0.02	0.06	0.06
Gender-Inclusive Facilities Only	0.11	0.09	0.08	0.02
No Gender-Inclusive Housing or Facilities	0.28	0.20	0.10	0.03
No On-Campus Housing Available	0.11	0.54	0.18	0.02
LGBTQ Counseling Groups	0.32	0.17	0.69	0.78
Trained Counseling Staff	0.57	0.31	0.88	0.89
Counseling Insurance Coverage	1.00	0.00	0.08	0.98
HRT Insurance Coverage	0.98	0.00	0.00	1.00

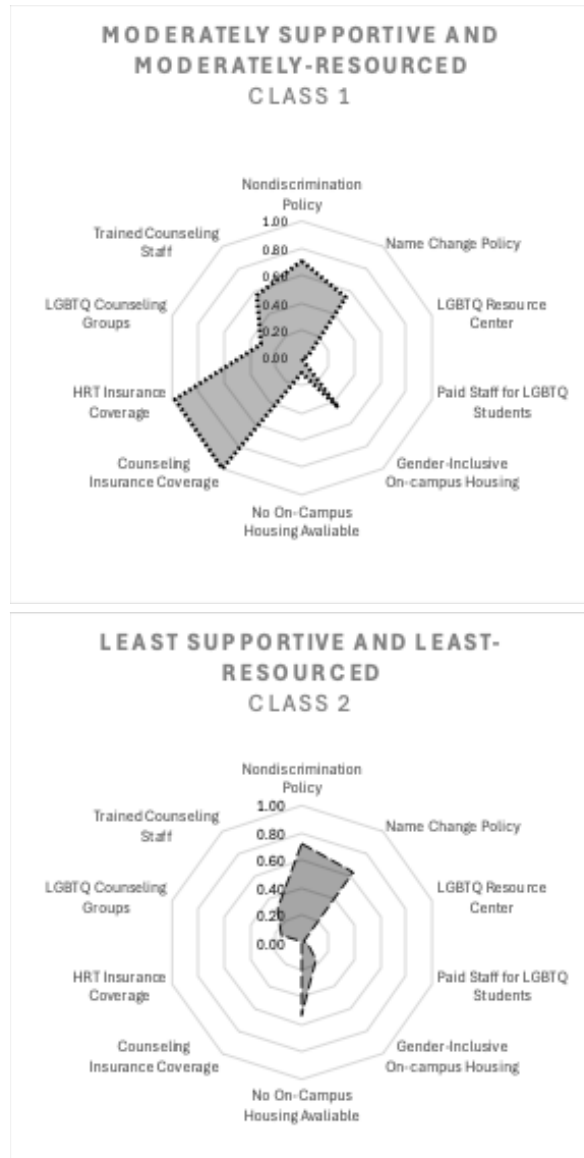


Figure 4.1. Radar Plot of Classes 1 and 2

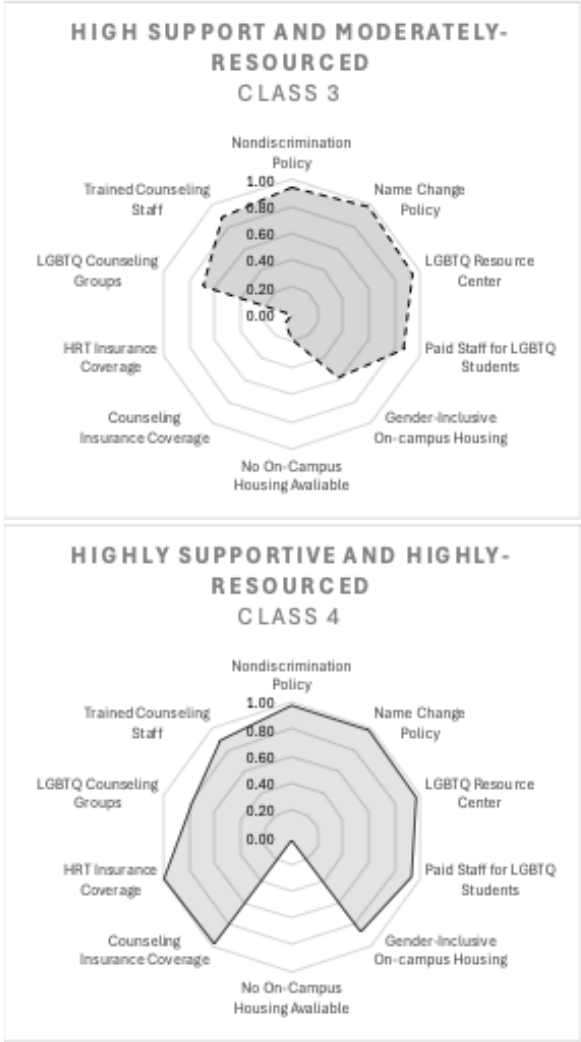


Figure 4.2. Radar Plot of Classes 3 and 4

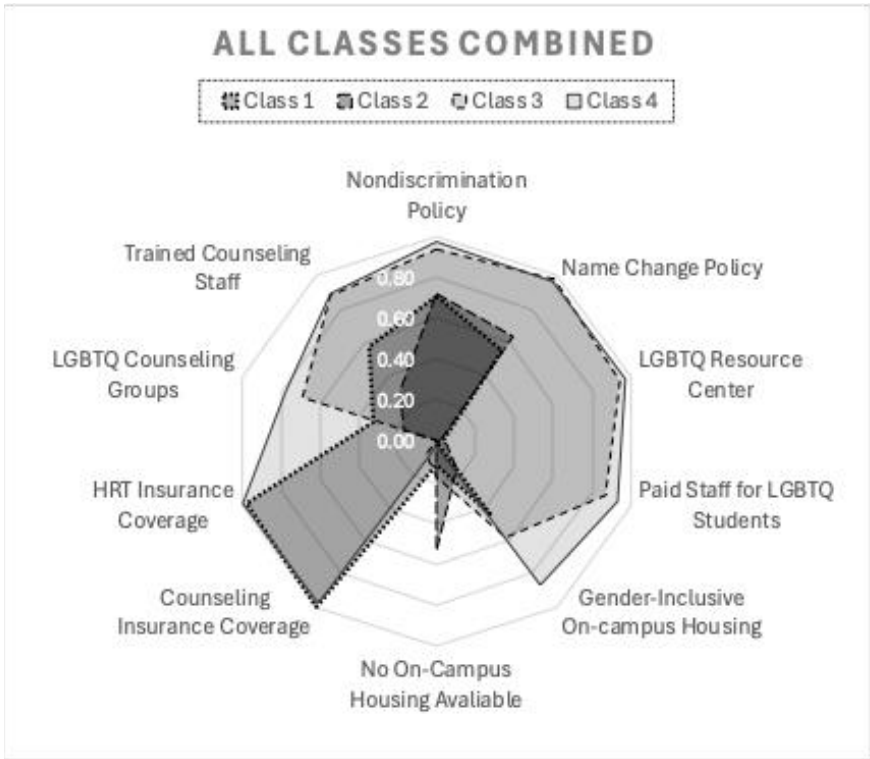


Figure 4.3. Radar Plot of All Classes

Least Supportive and Least-Resourced colleges (class 2) had the highest percentage of Associate's colleges (54.3%), a substantial number of schools with a student body of 1,000-4,999 students (45.7%), a high percentage of public schools (75.2%), the lowest graduation rate (42.1%), and the highest mean political lean for Republican-leaning congressional districts (R+ 1.7). This class also had the highest proportion of colleges in the East South-Central Census Division (15.2%; Kentucky, Tennessee, Mississippi, and Alabama), the Mountain Division (10.5%; Montana, Idaho, Wyoming, Nevada, Colorado, Arizona, and New Mexico), and the Pacific Division (19.0%; Alaska, California, Hawaii, Oregon, and Washington). It also had a low proportion of colleges in the New England Division (10.5%; Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) and the lowest proportion of colleges in the South Atlantic Division (8.6%; Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia).

Moderately Supportive and Moderately-Resourced colleges (class 1) were relatively evenly distributed across Baccalaureate colleges, Doctorate-granting institutions, and Master's colleges and universities (range: 25.0%-33.3%) and contained very few Associate's colleges (5.0%). Within this class, half of schools (50.0%) had a student body between 1,000 to 4,999 students, nearly half (48.3%) were public schools, and the mean graduation rate was 54.1%. The mean congressional district political lean for colleges in this class was Democrat leaning at D+ 4.2. Regarding geography, this class had the highest proportion, by far, of schools in the South Atlantic Division (38.3%) and a high proportion (20.0%) of schools in the New England Division.

The majority of Highly Supportive and Moderately-Resourced institutions (class 3) were Doctorate-granting institutions or Master's colleges and universities (50.5% and 22.0%,

respectively). Institution size was relatively evenly distributed across schools with 1,000-4,999 students, 5,000-9,999 students, and 10,000-19,999 students (range: 24.0%-30.0%), with 18.0% of schools having 20,000+ students. This class had the highest proportion of public schools (76.0%) and a graduation rate of 56.6%. Mean political lean was neutral at R+ 0.06. This class also had the highest proportion of colleges in the East North-Central Division (22.0%; Illinois, Indiana, Michigan, Ohio, and Wisconsin), a high proportion of colleges in the Pacific Division (18.0%), and the lowest proportion of schools in the New England Division (10%). Highly Supportive and Highly Resourced colleges (class 4) had the smallest percentage of Associate's colleges at 2.1% and the largest percentage of Doctorate-granting institutions (58.3%). Most colleges were either smaller (student body of 1,000-4,999; 32.3%) or large (student body of 20,000+; 30.2%). Exactly half of the schools in this class were public schools, and the mean graduation rate was the highest of all classes at 72.3%. Colleges in this class occupied, on average, the most Democrat-leaning congressional districts (D+ 6.4). This class also had the highest proportion of schools in New England (26.0%) and the lowest proportion of schools in the East-South Central Division (5.2%; Table 4.4).

Table 4.4. Campus Characteristics by Class Membership

Characteristic	Class 1 (n=60)		Class 2 (n=105)		Class 3 (n=50)		Class 4 (n=96)	
	%	n	%	n	%	n	%	n
Institution Type								
Associate's Colleges	5.0%	3	54.3%	57	14.0%	7	2.1%	2
Baccalaureate Colleges	33.3%	20	8.6%	9	12.0%	6	17.7%	17
Doctorate-granting	25.0%	15	13.3%	14	50.0%	25	58.3%	56
Master's Colleges and Universities	28.3%	17	14.3%	15	22.0%	11	15.6%	15
Special Focus Institutions	8.3%	5	9.5%	10	2.0%	1	6.2%	6
Institution Size								
<1000	11.7%	7	11.4%	12	2.0%	1	3.1%	3
1,000-4,999	50.0%	30	45.7%	48	26.0%	13	32.3%	31
5,000-9,999	23.3%	14	20.0%	21	30.0%	15	17.7%	17
10,000-19,999	10.0%	6	20.0%	21	24.0%	12	16.7%	16
20,000+	5.0%	3	2.9%	3	18.0%	9	30.2%	29
Public School Status	48.3%	29	75.2%	79	76.0%	38	50.0%	48
Community College Status	3.3%	2	54.3%	57	12.0%	6	2.1%	2
Geographic Region								
Midwest Region, East North Central Division	6.7%	4	11.4%	12	22.0%	11	14.6%	14
Midwest Region, West North Central Division	5.0%	3	5.7%	6	2.0%	1	7.3%	7
Northeast Region, Middle Atlantic Division	15.0%	9	13.3%	14	12.0%	6	9.4%	9
Northeast Region, New England Division	20.0%	12	10.5%	11	10.0%	5	26.0%	25
South Region, East South-Central Division	6.7%	4	15.2%	16	10.0%	5	5.2%	5
South Region, South Atlantic Division	38.3%	23	8.6%	9	14.0%	7	17.7%	17
South Region, West South-Central Division	1.7%	1	4.8%	5	2.0%	1	3.1%	3
West Region, Mountain Division	3.3%	2	10.5%	11	10.0%	5	5.2%	5

Table 4.4 (Continued)

West Region, Pacific Division Religious Schools	3.3%	2	20.0%	21	18.0%	9	11.5%	11
	18.3%	11	19.0%	20	18.0%	9	10.4%	10
	<i>M</i>		<i>M</i>		<i>M</i>		<i>M</i>	
Graduation Rate	54.1%	-	42.1%	-	56.6%	-	72.3%	-
Political Lean	D+ 4.2	-	R+ 1.7	-	R+ 0.06	-	D+ 6.4	-

Multinomial Models

Bivariate multinomial models compared the presence of institutional characteristics within Least Supportive and Least-Resourced colleges (class 2) to those within remaining classes. Baccalaureate colleges, Doctorate-granting universities, and Master's colleges and universities had higher odds of being in classes 1, 3, or 4 than class 2 (Least Supportive and Least-Resourced colleges) compared to Associates colleges. Regarding institution size, colleges with more than 20,000 students had higher odds of being in class 4 (Highly Supportive and Highly-Resourced colleges) than class 2, compared to colleges with less than 1,000 students. Public Schools had lower odds of being in class 1 (Moderately Supportive and Moderately-Resourced) compared to class 2, and lower odds of being in class 4 (Highly Supportive and Highly-Resourced colleges) compared to class 2. Community colleges had lower odds of being in classes 1, 3, and 4 compared to class 2. Regarding geography, colleges in the Middle Atlantic Division, the East South-Central Division, and the West Region had lower odds of being in class 4 versus class 2 when compared to colleges in New England. Additionally, colleges in the West Region had lower odds of being in class 1 vs class 2 when compared to schools in New England. A one-point increase in graduation rate was associated with increased odds of being in class 1, 3, or 4 compared to class 2. A 1-point shift in political lean towards the Democratic party and away from the Republican party was associated with higher odds of being in class 4 compared to class 2. Religious affiliation was not associated with class membership (Table 4.5).

Table 4.5 (Continued)

Midwest Region East	0.33	0.08	1.34	1.82	0.47	6.96	0.50	0.17	1.45
North Central Division									
Midwest Region West	0.59	0.11	3.30	0.38	0.03	4.19	0.53	0.14	2.07
North Central Division									
South Region South	2.73	0.84	8.90	1.93	0.43	8.69	0.93	0.30	2.91
Atlantic Division									
South Region East	0.26	0.07	1.03	0.64	0.15	2.78	0.14	0.04	0.49
South-Central Division									
South Region West	0.31	0.03	3.14	0.01	0.00	>500	0.19	0.02	1.50
South-Central Division									
West Region Mountain	0.17	0.03	0.93	0.91	0.20	4.05	0.20	0.06	0.72
Division									
West Region Pacific	0.09	0.02	0.47	0.82	0.22	3.10	0.23	0.08	0.64
Division	0.97	0.41	2.30	0.88	0.36	2.16	0.52	0.23	1.20
Religious Schools	19.42	3.35	112.59	35.74	5.71	223.64	6326.49	735.10	54447.28
Graduation Rate	1.02	1.00	1.04	1.01	0.99	1.03	1.03	1.01	1.05
Political Lean									

Discussion

TNB college students experience stark mental health inequities in comparison to their cisgender counterparts, which are of significant public health concern.⁶ While previous studies have attempted to examine the role of college policy in TNB student mental health, these studies are limited in scope and present conceptual and methodological limitations. The goals of this study were to 1) address these conceptual and methodological research gaps in the study of TNB-supportive policy environments, 2) discern differences in types of TNB-supportive policy environments, and 3) provide groundwork necessary to characterize relationships between TNB-supportive policy environments and student mental health. To our knowledge, this study is the first to describe the patterning of any structural efforts to mitigate cisgenderism. By using LCA this study employs novel and rigorous methods, grounded in social epidemiologic theory and best practices for causal inference. Results from this study show distinct patterns in the distribution of TNB-supportive college policies across US institutions of higher education. There was variation in the proportion of colleges implementing supportive policies across the sample. The most common supportive policy was nondiscrimination, with 82% of colleges implementing this policy. The least common policy was employment of paid staff for LGBTQ support services, with 41.5% of colleges implementing this policy. Institutional characteristics also showed substantial heterogeneity across the sample.

Findings from LCA indicate that TNB-supportive policy environments may be shaped by college resources, including financial resources and type and number of campus residential buildings, and political lean of a college's congressional district. Potential influences of these elements are best illustrated by examining the characteristics of the two moderately resourced classes. First, Highly Supportive and Moderately-Resourced colleges had a high probability of

having implemented nearly all TNB-supportive policies, with the exception of insurance policies and gender affirming housing. This class contained several indicators of more moderate college resources, including a graduation rate lower than the national average.^{243,244} This class also had a high percentage of public schools (76.0%), which have fewer financial resources on average per student than private institutions.²⁴⁵

Fewer insurance policies being implemented within Highly Supportive and Moderately-Resourced colleges may be an additional indicator of more moderate resources, as offering student insurance often requires substantial financial resources.^{246,247} While these data were not systematically collected, research team members who were involved with data collection reported that it was extremely rare for a college to offer insurance coverage but not offer coverage for at least HRT or counseling services for TNB students. Consequently, the absence of TNB-supportive insurance coverage at these schools may be more an indicator of limited financial resources to pay for insurance than reduced desire to support TNB students.

Most Highly Supportive and Moderately-Resourced colleges also offered on-campus housing, yet these colleges did not consistently offer gender-inclusive housing. Offering gender-inclusive housing may be in part driven by lower resources, as building new housing or converting existing housing structures into gender-inclusive housing can be cost-prohibitive, sometimes requiring building private bathrooms, shower facilities, or building housing with private rooms. While further data and analyses are needed for confirmation, these indicators of more moderate financial resources, lower implementation of high cost TNB-supportive policies, and high implementation for lower cost TNB-supportive policies may indicate a desire to create a TNB-supportive college environment that has been mitigated by budget limitations within this class.

In comparison, nearly all Moderately Supportive and Moderately-Resourced colleges offered insurance policies. This class also had the lowest proportion of public schools across classes (48.3%), only 3.3% community colleges, and the vast majority of schools offered on-campus housing, indicating at least moderate access to resources. However, this class implemented fewer TNB-supportive policies overall compared to Highly Supportive and Moderately-Resourced colleges. The lower implementation of moderate-cost policies (e.g., counseling policies and programmatic policies) and low-cost policies (e.g., administrative policies) within this class could indicate a lack of desire to support TNB students, a lack of knowledge concerning mechanisms for supporting TNB students, a need to prioritize other costs, or other motivations among colleges in this class. Additionally, nearly 40% of schools within this class were located within the South Atlantic Census Division, where most congressional districts within the state have a Republican political lean.²³² While the congressional districts within which colleges were physically located leaned Democrat in this class, it is possible that key stakeholders (e.g., board members, college presidents, alumni networks, and administrators) involved in policy decision making reflect and/or cater to the Republican political leans of the majority of congressional districts within their states. Republican political lean of surrounding congressional districts could therefore have resulted in schools within this class being less likely to implement TNB-supportive policies.

Least Supportive and Least-Resourced colleges had the lowest support for TNB students. In terms of indicators of low resources, colleges in this class had the highest probability of not offering any on-campus housing, a high percentage (75.2%) of public schools, no probability of insurance coverage, a high proportion of Associate's colleges (54.3%), and the lowest graduation rate (42.1%). These differences were statistically significant in that being a community college,

public school, or having a lower graduation rate was associated with membership in this least supportive class. Colleges in this class also had an average Republican political lean relative to other colleges, and the highest proportion of colleges in the East South-Central Division, where the vast majority of congressional districts are heavily Republican leaning.²³² It is possible that the combination of Republican lean within college's congressional districts in addition to substantial Republican lean within the remainder of the state contributed to higher levels of anti-TNB bias and may have influenced the decisions of administrators and other key stakeholders to create fewer TNB-supportive policies.^{241,242} As a result, this class may be least supportive due to both a lack of resources and a lack of political motivation to support TNB students.

In comparison, Highly Supportive and Highly-Resourced colleges had the highest probability of supportive policies and indicators of high financial resources. For example, this class had fewer public schools, nearly all colleges in this class had insurance policies, only 2.1% of schools were Associates Colleges, and average highest graduation rate was 72.3%. This class also had the strongest Democrat-leaning political lean. This suggests administrators at these colleges may have the desire, knowledge, and financial resources needed to create a supportive environment for TNB students.

It is notable that, while Least Supportive and Least-Resourced colleges offered the least amount of support overall, they still had a notable proportion of supportive administrative policies. Implementation of nondiscrimination policies within this class might be due to efforts to demonstrate compliance with the Obama and Biden administration's policies regarding the interpretation of Title IX, which stated that discrimination against sex in educational settings was inclusive of discrimination against gender identity.²⁴⁸ As a result, it is difficult to determine to

what degree inclusive nondiscrimination policies are indicators of further support received by TNB students.

The prevalence of name change policies may be moderate in Least Supportive and Least-Resourced colleges in part because name change policies that do not require a legal name also support inclusion efforts for international students who use a non-legal English names while studying in the US.²⁴⁹ Schools implementing name change policy websites often noted international students using non-legal English names as an example of a reason for having a non-legal name change, though these websites did not often mention TNB students. While accessible name change policies offer support to TNB students regardless of the intention behind policy implementation, there may be differences in the magnitude of broader support indicated by the presence of name change policies at different colleges. For example, at some colleges, the impact of name change policies on the policy environment may be limited exclusively to the ability to change one's name on institutional records without a court order. However, at other colleges, the presence of name change policies may also serve as an indicator of administrators' knowledge of and desire to meet the needs of TNB students, which may provide additional positive impacts on TNB student mental health.

It is also notable that, while we observed differences in the distribution of institutional characteristics across classes, various types of schools have the potential to have TNB-supportive policy environments. For example, while class 2 (Least Supportive and Least-Resourced colleges) had the highest proportion (54.3%) of community colleges and a high proportion of public schools (75.2%), class 3, which contained Highly Supportive and Moderately-Resourced colleges, contained 12% community colleges and 76% public schools. This indicates that more public schools and community colleges likely have the potential to improve supportiveness of

TNB students. Similarly, while community college status was associated with lower odds of being in a class with moderate or highly supportive policy environments, our models measured associations and not causal effects. It is possible that community colleges may experience barriers to supporting TNB students that can be reduced with increased resources and/or information on the benefits of enacting TNB-supportive policies.

Given the current anti-TNB sociopolitical climate in the US, it is especially important for researchers, interventionists, and college policy makers to better understand the nature and drivers of TNB-supportive policy environments. The past five years have seen unprecedented attacks on TNB youth and adult's civil rights at the state and federal levels.⁹⁻¹¹ The severity of these policy-based attacks have increased substantially since 2021, especially with the onset of the second Trump administration in January 2025.^{10,11} Based on prior research, these attacks are likely to result in a dramatic increase in the burden of mental health concerns among TNB students.^{195,250,251} Recent federal executive orders are putting further pressure on colleges to reduce efforts to support marginalized students, including TNB students, by threatening to withdraw federal funding from schools that either a) support diversity, equity, and inclusion initiatives,²⁵² or b) allow TNB students to participate in some school activities (e.g., athletics).²⁵³

While many of these executive orders are being challenged in court at present, there is likely to be a chilling effect regarding institutional support for TNB students, especially among schools who receive federal and state funding.²⁵² For example, the second Trump administration has not only nullified the rule regarding inclusion of TNB students in Title IX policies²⁵⁴, but reversed it by banning TNB student participation in sports. As a result, it is possible that colleges may remove gender identity from their nondiscrimination policies to comply with the goals of the Trump administration. Colleges have already begun to cancel DEI-related events and

programming,²⁵² which can include services provided by LGBTQ resources centers and paid staff supporting LGBTQ students. Additionally, college health centers may also restrict gender affirming care services.¹⁰ As TNB-supportive policy environments at federal, state, and institutional levels worsen rapidly, ongoing research to understand and improve critical components and drivers of supportive environments for TNB and other marginalized students is needed now more than ever.

Strengths and Limitations

To our knowledge, this is the first study to measure and characterize the patterning of structural efforts to mitigate cisgenderism, a critical component for future research of intersectional health disparities faced by TNB individuals.^{38,255} With 311 colleges represented, this is also the largest institutional-level study of TNB-related college policies. Methodologically, the use of LCA in this analysis is novel and addresses gaps in the literature regarding the operationalization of campus policy environments. This study also opens the doors for future research on efforts to structurally mitigate cisgenderism, as the results of this study can be combined with national data from HMS to examine the impacts of TNB-supportive policy environments on college student mental health. Our findings can thus serve as a valuable contribution to the literature for examining the role of policy environments in the health and experiences of college students prior to the initiation of the recent federal-level anti-TNB political attacks.

This study also contains limitations. Across nearly all sources of data in this study, we relied on self-reported data from institutions. While we attempted to limit this bias by contacting relevant administrators and staff when conducting phone and email-based data collection, our

data may still contain bias. For instance, some colleges may have presented themselves to be more or less supportive than they actually are, either due to incorrect knowledge or assumptions regarding TNB-supportive policies, or a desire to present the campus as more or less supportive. Additionally, while this study focused on the patterning of 12 policies often mentioned in the literature, there are many more institutional factors and policies²²⁹ influencing TNB student experiences that were not taken into consideration in this study and may shape TNB-supportive policy environments. Regarding analysis, while we had initially planned to control for political lean in LCA models, we were unable to due class instability, which could have resulted in statistical bias in the estimates of class membership. We instead included political lean in our assessment of the distribution of institutional characteristics across latent classes, which showed differences in political lean across policy environments. Regarding measurement, policy measures were dichotomized to align with Campus Pride's data reporting protocols, however this forced us to obfuscate the wide variation in the implementation of some policies. For example, different colleges allow name changes in different aspects of institutional records (ID, email, class rosters, health records, etc.), such that some colleges allow name changes in only one or two locations, while others allow name changes in most or all locations. Similarly, we coded religious affiliation as dichotomous, which may have also prevented us from observing differences in the type of religious affiliation across classes. (For example, Jesuit schools may be more supportive of TNB college students compared to Southern Baptist schools.) Lastly, this study drew on data regarding institutional characteristics as indicators of potential access to resources among institutions, including public-school status. While public schools spend less money per student than private schools, state-level funding per student can vary substantially by state.²⁵⁶ Cost-of-living-adjusted, state-specific public funding per student may be a better metric

to approximate heterogeneity in resources across TNB-supportive policy environments in addition to public/private institution status.

Future Directions

Future studies should examine impacts of exposure to TNB-supportive policy environments on TNB student mental health outcomes. These studies should be conducted using an intersectional framework to assess the degree to which policy environments may differentially impact TNB college students across other dimensions of social position (e.g., racialization/ethnicity, socioeconomic status, and sexual orientation). Future efforts to classify TNB-supportive policy environments should 1) explore how covariates such as local political lean and religious affiliation contribute to the characterization of the policy environment, 2) examine variation in the degree of implementation of adopted supportive policies across colleges, and 3) examine a wider number of policies. Future analysis of TNB-supportive policy environments should also more directly examine potential roles of financial resources in TNB-supportive policy environment creation, including funding sources and amounts of funding per student. For example, using cost-of-living-adjusted state-specific rates of post-secondary institution public funding per student as an indicator of resources may better approximate heterogeneity in state-level public school access to resources.

Future research should also examine the priorities, desires, and knowledge of key stakeholders and policymakers within colleges in less supportive vs. more supportive policy environments to inform intervention development. Lastly, especially given the current anti-TNB sociopolitical climate, further research is needed to ascertain the relationships between state federal policy, TNB-supportive college policy environments, and TNB student mental health, as

TNB-supportive policy environments may act as a partial buffer to the negative mental health impacts of discriminatory policies at state and federal levels.

Overall, this study used an innovative methodological approach to overcome conceptual and methodological limitations within the field of TNB student health research. We offer insights into the different types of policy environments experienced by TNB US college students and identify potential explanatory factors for differences between policy environments. While further research is needed to understand the relationships between TNB-supportive policy environments and TNB health outcomes, this study takes a crucial next step toward this objective at a critical period in time.

Chapter 5: Conclusion

In summary, this research characterizes social determinants and the patterning of mental health outcomes among TNB youth and college students. In particular, findings suggest opportunities to intervene to support caregivers of TNB youth, and subsequently, TNB youth themselves, at all levels of the social ecological model. Examining intersectional mental health outcomes of TNB college students across social positions defined by gender identity, race/ethnicity, and socioeconomic status suggested that border identity stress plays a role in TNB student mental health. Lastly, findings also document the possible role of college resources in determining the level of support provided to TNB college students by their institution.

Future work on caregivers of TNB youth should include greater representation of families of color and longitudinal and quantitative studies of the needs of and intervention effectiveness among caregivers of TNB youth. These studies should also discern between caregiver perception of their acceptance or supportiveness of TNB youth and a caregiver's enactment of supportive behaviors to better understand the ways in which caregivers may improve their support of TNB young people. Future studies of intersectional college student mental health outcomes should examine the role of policies, resources, and other college-level factors in mitigating mental health outcomes and health disparities of multiply marginalized college students.

The findings of these studies also have important implications for research and clinical practice more broadly in the field of TNB youth and college student mental health. Overall, there is a need to center the voices and experiences of TNB youth of color, college students of color, and their families. Incorporating core ideas of intersectionality (social inequality, power, relationality, social context, complexity, and social justice) and community-based participatory

research (CPBR) can support researchers in engaging in this work within a single study, or within a broader research agenda.³⁸ For example, CPBR-informed qualitative work among TNB individuals and families can focus exclusively on the influences of social inequalities among TNB families with shared culture and similar experiences of systemic oppression. Such studies can complement secondary quantitative data analyses by examining the roles of power and social context, two components of intersectionality often left out of quantitative intersectional research.

To better incorporate the final core idea of intersectionality, social justice,³⁸ intersectional, CBPR-informed interventions, should be implemented for TNB youth, families, and college students at all levels of the social ecological model. These interventions are especially needed at the community, organizational, and societal levels where there is an absence of empirical studies of the effectiveness of interventions. Within the context of families, interventionists may consider tailoring their work to the needs of families of color, as previous interventions have focused predominantly on White families. Within the context of colleges, policy-based interventions should consider examining impacts of policy environments supporting both students of color and TNB students.

The development of community and organizational-level interventions is especially critical at this time due to increasing political attacks on TNB youth and college students, as these interventions may serve as buffers for the harmful impacts of these policies on TNB mental health. Societal-level interventions should also be enacted to shift anti-TNB beliefs and norms, and challenge anti-TNB policies. Researchers must build skills in political advocacy and coalition building to challenge discriminatory and unscientific policies being implemented that will ultimately harm all trans youth and adults. Societal-level interventions should also utilize an intersectional framework to ensure equitable benefits for all TNB individuals. Ultimately,

engaging in intersectional, multi-level intervention development provides essential recommendations needed to promote healthy, thriving futures for TNB populations.

Appendix

Table S1. Fixed Effects of Intersectional MAIHDA, Unadjusted

	Depression Symptoms		Suicidal Ideation		Suicide Attempts		Positive Mental Health	
	OR	CI	OR	CI	OR	CI	OR	CI
Simple intersectional model								
Random Effects								
Between-stratum variance	6.4	-	0.5	-	0.6	-	8.5	-
VPC, %	13.8	-	13.6	-	14.7	-	14.7	-
Intersectional model								
Gender Identity								
Transgender Women	4.48	3.72 – 5.24	5.05	3.97 – 6.42	5.72	3.61 – 9.06	-6.28	-7.32 – -5.24
Transgender Men	5.20	4.69 – 5.71	4.02	3.41 – 4.74	4.73	3.51 – 6.37	-5.72	-6.42 – -5.02
Non-binary, AFAB	5.14	4.61 – 5.67	4.85	4.09 – 5.74	4.12	3.00 – 5.66	-5.58	-6.30 – -4.86
Non-binary, AMAB	6.15	5.85 – 6.46	4.46	4.04 – 4.92	3.52	3.01 – 4.11	-5.94	-6.35 – -5.53
Cisgender Women	1.73	1.51 – 1.95	1.22	1.13 – 1.31	1.07	0.96 – 1.19	-0.28	-0.57 – 0.01
Race/Ethnicity								
American Indian/Alaskan Native American	0.82	0.08 – 1.56	0.90	0.65 – 1.25	1.65	0.77 – 3.53	-0.62	-1.63 – 0.39
Indian/Alaskan Native and White	1.25	0.69 – 1.81	1.58	1.30 – 1.92	3.42	2.41 – 4.85	-1.18	-1.94 – -0.42
Asian	-0.40	-0.76 – -0.05	0.85	0.77 – 0.95	1.20	1.04 – 1.38	-1.11	-1.57 – -0.64
Asian and White	0.20	-0.26 – 0.66	1.11	0.95 – 1.29	1.22	0.88 – 1.70	-0.45	-1.06 – 0.17
Black/African American	-0.30	-0.67 – 0.07	1.11	0.99 – 1.24	2.16	1.88 – 2.47	0.92	0.43 – 1.41
Black/African American and Hispanic/Latine	1.27	0.71 – 1.82	1.30	1.06 – 1.59	2.08	1.35 – 3.19	-0.70	-1.45 – 0.05
Black/African American and White	0.96	0.48 – 1.44	1.46	1.24 – 1.71	2.21	1.63 – 3.01	-1.23	-1.87 – -0.59
Hispanic/Latine	0.22	-0.14 – 0.58	0.92	0.82 – 1.03	1.36	1.17 – 1.58	-0.22	-0.69 – 0.25

Table S1 (Continued)

Hispanic/Latine and White	0.41	0.03 – 0.80	1.10	0.97 – 1.24	1.34	1.07 – 1.67	-0.27	-0.78 – 0.24
Middle Eastern/Arab	0.58	0.12 – 1.05	0.86	0.72 – 1.02	1.01	0.66 – 1.55	-0.78	-1.40 – -0.16
Middle Eastern/Arab and White	0.62	0.04 – 1.21	1.02	0.82 – 1.28	1.00	0.53 – 1.89	-0.47	-1.26 – 0.31
Multiracial or Monoracial of Another Race	1.19	0.79 – 1.60	1.45	1.27 – 1.64	2.33	1.90 – 2.86	-0.84	-1.38 – -0.30
Native Hawaiian/Pacific Islander	0.75	-0.20 – 1.69	1.13	0.75 – 1.70	3.05	1.35 – 6.89	0.81	-0.49 – 2.11
First Generation College Students	0.72	0.52 – 0.91	1.10	1.03 – 1.17	1.14	1.04 – 1.26	-0.87	-1.13 – -0.61
Random Effects								
Between-stratum variance	0.1	-	0	-	0	-	0.1	-
VPC, %	0.2	-	0.2	-	0	-	0	-
PCV, %	98.6	-	98.7	-	100	-	98.3	-

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