The Development of a Measurement and Structural Model
of Gender Affirmative School Climate

by

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ABSTRACT

The theoretical basis of the proposed study is drawn from an ecological-transactional (Lynch & Cicchetti, 1998) systems approach to development, which focuses on contexts, and correspondingly, overlays the gender affirmative model's (GAM) transactional model of support (Keomeier & Ehrensaft, 2018) to reveal protection in the school ecology. Combining these two approaches provides unique insights into protective factors in the school ecology, distinct from developmental systems approaches driven by the minority stress model (Meyer, 2003), which are designed to highlight the multidimensional quality of risk (Eisenberg et al., 2019).

The dissertation had two central aims: 1) to report on the development of the Gender Affirmative School Climate (GASC) scale, a self-report survey designed to capture high school climate specific to the domain of gender, and 2) to explore how gender affirmative school climate (GASC) relates to student self-esteem and school belongingness. Unique from risk factors approaches the central aims sought out to identify protective factors within a developmental system ecology of the high school context.

In two pilot studies (N=12; N=758; trans = 413, non-trans = 344) and primary study (N=813; trans = 482, non-trans = 328) results for scale development provide evidence to validate assumptions that the proposed (GASC) construct captures what was intended, that is, school climate specific to the domain of gender. However, measurement invariance procedure showed that not all items operated equivalently across trans and non-trans groups, and confirmed that the proposed scale meets criteria for "weak measurement invariance".

High school students that reported more positive school climate reported lower self-esteem scores. Only one protective moderator was consistent with hypotheses: More feelings of similarity to peer group gender (boys) emerged as a protective factor for transgender identified high schoolers attenuating the negative relationship between perceptions of school climate and self-esteem. Latent measurement models for each gender group demonstrated that the school belongingness construct is highly related to the proposed (GASC) construct. This demonstrated domain overlap with "feelings of school belongingness" signals that the proposed scale showed good convergent validity. The results provide insight about ways high schools can be pro-active to promote a healthier school climate for transgender students.

DEDICATION

Dedicated to my Mom and Dad.

ACKNOWLEDEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

The school ecology emerges in the literature to be just as tenuous as a space as the home for transgender adolescents (Keomeier & Ehrensaft, 2018). For example, when transgender teens meet with a medical provider, such as a therapist, youth first commonly express anxiety about school and being victimized in this space (Lev and Wolfgould as cited in Keomeier & Ehrensaft, 2018). However, research is only beginning to identify factors that promote resilience among this at-risk group when they are at school (Gower et al., 2018; Taliaferro, McMorris, & Eisenberg, 2018; Hatchel & Marx, 2018; Jones et al., 2016; McGuire et al., 2010). Although literature shows that "empowering youth and school personnel to create a more inclusive school climate may be the missing link in improving the school environment and health of LGBTQ students" (Baams, Semon-Dubas, & van Aiken, 2017, p.941), research methods that have been employed to address this topic often draw upon the minority stress model, and this model is more oriented to reveal risk instead of protection. Likewise, school climate measures that are used as a tool to predict transgender student wellness outcomes, including those that capture facets of school climate, more commonly correspond with stress versus protection, such as bullying and victimization (Hatchel & Marx, 2018). Currently, there is limited school-based research driven by the gender affirmative approach that identifies and measures protection within a school ecology (Luecke 2011; Luecke, 2018; Malpas, Glaeser, & Giammatei, 2018).

While identifying risk factors has provided important information about stressors in trans students' lives, this approach tells only part of the story. Unique from the risk

factors approach, the goal of the present study is to identify and reveal protective factors within a developmental system ecology of the school. As a result, the present study intends to call attention to how the school ecology facilitates trans students' well-being, and overall, their ability to thrive in this context. More specifically, the general aims of the current study includes measuring: 1) the relationship between the proposed gender affirmative school climate measure and self-esteem among transgender and non-trans students, 2) the relationship between the proposed school climate measure and school belonging among transgender and non-trans students, and 3) the extent to which individual level (transgender-related pride) and group level variables (involvement in activism; similarity to peer group gender) moderate the relationship between school climate and school wellness outcomes (self-esteem; school belongingness). To accomplish these aims, a measure of school climate focusing on gender in school spaces is needed. Building upon research that has identified gender affirmative strategies which bolster school climate for transgender and other gender diverse students (Luecke, 2018; Ullman, 2018; Goodrich & Barnard, 2018; Coulter et al., 2016; Toomey, McGuire, & Russell, 2012; Baams, Dubas, & van Aiken, 2016; Scrofani et al., *Under Review*), the proposed gender affirmative school climate scale is intended to be used as a tool to 1) reveal and measure factors that educate and affirm high school students, focusing on the treatment of gender in school spaces, and 2) to relate school climate to student wellness outcomes (self-esteem and school belonging) using the instrument developed. Currently, there is no validated measure that captures dimensions of a school climate of gender among students at large, and there is no validated climate measure focusing on gender that is guided by the needs of gender diverse and trans students. This research aims to

help to highlight school efforts to facilitate transgender student support, (such as creating visibility and inclusion (Luecke, 2018), instigating a culture of gender equity, and educating about gender diversity), and reinforces that the benefit of these efforts is not limited among transgender youth, but for the student community at large (Ullman, 2018). Among the 6 states in the US that have explicit policy guidelines in place to create a positive school climate for transgender students (GLSEN, 2020), correspondingly have made progress in implementing gender programming for the student body at large. Commonly, this support focuses on the treatment of gender and diversity education in curricula, such as reducing the salience of traditional gender roles in education across subject domains (i.e. teaching about why gender stereotypes in the math and sciences came about). Perhaps the most tangible alternative approach in contrast to more progressive programming emerges among single sex gender programming approaches which do not provide a space for students to learn and identify outsides of a strict binary (Gurian Institute; Gurian, Henley, & Trueman, 2011).

US Policy Creates New Challenges for Transgender Students

Transgender high school students in the US continue to be one of the most at risk populations to face challenges in school spaces. In a recent webinar by the Society for Adolescents (SRA; December 2021) a panel of trans-focused researchers and activists and youth shared results of recent research on trans youth development, and discussed the negative impact of state mandated legislature which discourages support for trans youth in schools, and the home. Asaf Orr (National Center of Lesbian Rights) explains how regional pushback towards transgender youth began in 2016 when Kentucky joined 11

3

other states against the federal government proposing to ban transgender bathroom guidelines. Orr continued to explain, conservative pushback during the Trump administration continued in 2019, with Idaho's transgender athlete bill banning trans girls and women from participating in school sports. Passed in 2020, similar legislation has been created 19 states (2021, Boise State Public Radio), such as Utah's "Preserving Sports for Female Students" bill that proposes that public school student athletes can only play on teams aligned with their birth sex. SRA panelists Andrew Cronyn (Transhealth Northampton) and Debi Jackson (Gender inc.) emphasize that bills proposed in the past decade, and others, (such as the introduction of legislature against trans disclosure in schools in 2020-2021), are about erasing transgender youth. More specifically, Debi Jackson described how recent proposed bans against access to youth gender affirmative healthcare for youth, such as in Arkansas and Alabama (2021), follow a strategic agenda to take away the voices of parents, by creating laws which rationalize that affirmative care is child abuse. Making gender affirmative care for trans youth illegal has consequences which extend beyond the home, such as push back to ban or restrict talking about gender identity in schools. Despite recent challenges against transgender youth in US, Russ Toomey (University of Arizona) explained how research shows that parents, teachers, and using the correct names or pronouns are leading protective factors promoting healthy trans youth development.

Individual and Group Level Protective Factors

Based on the minority stress model (Meyer, 2003) applied to transgender and other gender diverse people (see Testa et al., 2015), previous research on transgender

individuals have identified individual and group level protective and risk factors that explain the process by which minority stress relates to wellness outcomes (Katz-Wise et al., 2021; Breslow et al., 2015; Testa et al., 2015). Research has begun to move beyond solely focusing on risk in this model, to explain the process by which protection relates to wellness outcomes (Barr, Budge, & Adelson, 2016), and to identify individual and group level factors that facilitate the relationship between protection and wellness. Moreover, recent school-based studies which sample transgender students have been designed to focus on protection, and seek to identify individual and group level factors that contribute to the process by which school supports relate to student wellness outcomes (McGuire et al., 2010; Heck et al., 2014; Hatchel & Marx, 2018).

To reveal protective factors, moderators were included in the structural model to interact with school climate to influence student wellness outcomes. Moderators can be used to reveal transactions (Sameroff & Mackenzie, 2003) that define different processes of resilience (Luthar, Cicchetti, & Becker, 2000). The body of existing literature that shows indirect transactions of school climate on trans adolescent development *within* each contextual level of an ecological model, and *between* multiple contextual ecologies commonly include moderators in their structural models to captures these relationships (Pampati et al., 2020; Day, Perez-Brumer & Russell, 2018; Greytak, Kosciw, and Boesen, 2013; Hatchel & Marx, 2018). Mediation is sometimes used in research to show indirect relationships so the influence of multiple predictors can be observed to impact development jointly (Bornstein & Lamb, 2015), however most of this research is cross-sectional, so directionality cannot be established among variables associated with student outcomes (McGuire et al., 2010, Heck et al., 2014, Hatchel & Marx, 2018).

Research based in school settings has started to focus on the overlap between macro and micro systems in contributing to trans students' school climate, such Hatchel and Marx (2018) and Eisenberg's et al. (2019) research that examines the indirect effect of micro-level (i.e. school belongingness) and macro-level variables (i.e. school location geography/community) in influencing the relationship between transgender middle and high schoolers perception of safety and student wellness outcomes. Accordingly, this research helps to identify if protection against risks at school varies more so by the broader social ecology, or by closer proximal and individual factors.

The addition of moderators to the model allowed for a more complex look at specific types of resilience, conversely risk mechanisms, that illustrate the simultaneous experience of multiple contexts, such as the school and ontological indicators, or the school and the home environment (Luthar, Cicchetti, & Becker, 2000). For example, Eisenberg et al. (2019) results demonstrate "amplified disadvantage" by showing that transgender middle and high schoolers attending school in sub-urban settings experience high rates of psychological disorders as compared to students in urban and rural settings. Put simply, this specific resilience process shows how students that experience advantages in one setting, may be experiencing heighted disadvantages in another setting (Gaias et al., 2017). Moreover, revealing "amplified disadvantage" (Gaias et al., 2017), such as stress in parent-child relationships when acceptance gained at school is not mirrored by close family members, can be more thoroughly examined by the including moderators in the model.

Understandably, the USDOE doesn't have a clear category for ontological processes, or the unique way that each student interprets and copes with vulnerability and

6

privilege. Individual level variables such as transgender pride (Bockting et al., 2020), internalized transphobia (Breslow et al., 2015), and gender stereotyping (Olson & Enright, 2016), can help give a more detailed and nuanced look at one-on-one and group socialization in school spaces. The need for a concentrated focus on the dynamic between socio-emotional development and student wellness at school is most profound for transgender students, since trans youth are among the most marginalized communities in and out of school spaces. Especially, given the salience of gender in school spaces.

In keeping with interest in focusing on protection in the school ecology (see model by Testa et al., 2015), in supplemental analyses I will measure the mediating role of individual (pride in transgender identity) and group level supports (involvement in activism; similarity to peer group gender) in the relationship between gender affirmative school climate and student wellness outcomes. The mediating role of minority stress at the individual level (internalized transphobia) will be included in the mediation model for comparison. In addition, for supplemental analyses I plan to assess the mediating role of "similarity to peer gender groups" in the relationship between gender facilitative school climate and school wellness outcomes (self-esteem; school belonging), given research that demonstrates the similarity between transgender and cisgender students in identifying as members of their gender group (Gulgoz et al., 2020), and some advantages of gender similarity with peers in school spaces.

While most school-based research assessing LGBT middle and high schoolers that measures intermediary processes which influence the relationship between school climate and student outcomes define school climate by risk, commonly bullying and victimization (Hatchel & Marx, 2018), some isolate school supports (McGuire et al.,

2010; Heck et al., 2014; Kosciw et al., 2013). For example, results from McGuire et al. (2010) show that, among LGBT high school students, connection to adults at school mediated the positive relation between school protective factors (e.g., five strategies including teacher intervention for gender and sexuality-based harassment, participation in GSAs, etc.) and students' reported feelings of safety. In other words, only when schools were proactive in creating a positive school climate focusing on gender and sexual identities did students report more positive connections with school staff, precipitating more positive perceptions of safety (McGuire et al., 2010). Furthermore, in a follow-up focus-group study specific to a subsample of transgender students, the role of teachers and staff in promoting school climate emerged as the most protective factor in the school ecology. For example, transgender students spoke about the need for state-wide coalitions to initiate staff and teacher interventions, and more proximally, the need for teacher and staff to intervene when witnessing gender-based harassment (McGuire et al. 2010).

Similar to McGuire's et al. (2010) research that attends to the gap in the literature among LGBT students to identify school-based supports that inform school climate, and the influence of school supports on student's academic outcomes, Kosciw et al. (2013) findings demonstrate that two of four school supports examined (comprehensive anti-bullying/harassment policy and supportive educators) emerged as significant predictors of student's self-esteem. At the same time, when victimization based on gender expression was included as a moderator in the regression model, results suggest that inclusive curricula may be particularly protective among schools for the students who are more severely victimized (Kosciw et al., 2013). More specifically, high victimization

based on gender expression increased the strength of the positive relationship between inclusive curricula and students' self-esteem.

Not only do findings demonstrate that school supports such as school belongingness (Heck et al., 2014) and inclusive curricula (Kosciw et al., 2013) contribute to gender diverse students' health and education outcomes, but these findings show how peer relationships are central in facilitating this relationship. Based on research that identifies distinct ways gender diverse students' cope and become resilient in school spaces, the current study also sampled cisgender students (and other non-transgender identified identities) to identify which individual and group level protective factors are more relevant for transgender students versus cisgender students. At the same time, I examined which individual and group level factors are relevant for non-transgender identified students in facilitating the relationship between school climate and wellness outcomes (self-esteem; school belongingness).

Developmental Systems and the Gender Affirmative Model (GAM)

The theoretical basis of the proposed study is drawn from an ecological-transactional (Lynch & Cicchetti, 1998) systems approach to development, which focuses on contexts, and correspondingly, overlay the gender affirmative model's (GAM) transactional model of stress (Keomeier & Ehrensaft, 2018) to reveal protection in the school ecology. This approach provides unique insights into protective factors in the school ecology, distinct from developmental systems approaches driven by the minority stress model (Meyer, 2003), which correspondingly are modeled to highlight the multidimensional quality of risk (Eisenberg et al., 2019). The literature assessing school

climate among transgender and other gender diverse identities demonstrate that when

support and risk within the school ecology is organized multi-contextually, so that

multiple contexts can be considered (Scrofani et al. *Under Review*; Leung et al., 2022),

we can isolate specific protection and strain by proximity, and more easily observe how

these factors overlap. To be more specific, applied to the school ecology, bioecological

(Beale-Spencer, 2017; Bronfenbrenner & Morris, 2006) and transactional (Sameroff,

2009) systems approaches to development can reveal the ways broad contextual forces

interact to create each student's shared experiences, risks, and opportunities, but equally

stress the role of perception and cognition in micro-exchanges (Leung et al., 2022; Santa

Lucia et al., 2000), such as each student's unique exposure to "messages about

opportunity, power, and privilege" (Beale-Spencer, 2017, p.288).

The gender affirmative model (GAM) overlayed on the ecological-transactional

model provides a useful framework to conceptualize resilience processes dialectically,

allowing us to better highlight protection and resilience in the school domain. Moreover,

Ehrensaft's GAM model (2017) meshes well with the ecological-transactional approach

to development (Lynch & Cicchetti, 1998) because it follows a transactional model to

conceptualize development, however, focusing in on gender. In this way, Ehrensaft's

(2011; 2017) conceptualization of the developmental system of gender identity and

socialization (nature, nurture, culture, time) is defined as a "gender web". This

conceptualization stands between traditional gender essentialist epistemologies that favor

biology, and more recent social constructivist conceptions of gender identity that favor

social influence. That is, Ehrensaft (2011) emphasizes that gender development is not

created out of thin air, but it is a dialectical creation between the organism and the

environment. More specifically, the GAM is in line with Sameroff's (2009) transactional approach in that they both go beyond Cartesian split ontology on their position about the function of nature and nurture by using systems epistemology. In this way, gender identity in development is not understood as either the result of nature or nurture, rather mutually impacted by both biology and socialization through time from the system of exchanges experienced. Commonly, theories of gender identity based in nature traditionally regard biological sex as the official marker of gender identity (Buss, 1995). Conversely, theories of gender identity based in nurture assume gender identity develops primarily through a process of socialization (Harris, 1995). However, the system of exchanges encompassed by the "gender web" is distinct from split mechanistic-contextual ontology that presumes that development of gender identity is a passive experience, one in which we are either recipients to a socializing world, or limited by birth sex. As a result, systems approaches to gender identity in development (Fausto-Sterling, 2012) take into consideration an individual's *perceptions* in micro-exchanges with individuals, and macro-exchanges with groups, communities, and social contexts. From the start, this creates a space for children's own gender creativity and inclinations apart from what is being imposed on them from others (Ehrensaft, 2011; 2016).

Proximally, the gender affirmative approach is distinct from traditional approaches to parenting gender diverse youth that encourage parents to correct their children. Instead, GAM reverses this dynamic. Accordingly, rather than correcting gender nonconforming behavior, Ehrensaft (2011) argues that parents of trans youth should be encouraged to follow their child's lead by avoiding imposing their own bias or preferences on them. The GAM and transactional approaches to parent-child research

allow us to follow this dynamic process or "discover the conditions under which positive discontinuities could occur- when a change in one partner has the opportunity to reorganize the behavior in the other" (Sameroff, 2009, p.19). This incentive extends outside the home, and is particularly applicable to teacher-student dyads (and other adult school professionals working with trans students) who are experiencing inter-generational differences in beliefs regarding gender diversity and transgender embodiment.

Broadly speaking, ecological systems models have the potential to reveal how risk and resilience unique to transgender youth are impacted by the interplay of many social positions. Overall, the GAM mirrors the multi-dimensional approach MDFA (Multi-Dimensional Family Approach; Malpas et al., 2011) created to be used with transgender youth, which encourages that family support, access to the community, and child well-being must be each be considered with respect to other contexts. Within transgender students' immediate community, research clearly demonstrates the need for resilience to be fostered in school spaces, above all other community settings (Greytak et al., 2009; Keo-Meier & Ehrensaft, 2018). Although the GAM is traditionally applied as a therapeutic model in clinical settings, the approaches' basic tenets are beginning to be applied to school-based research on gender diverse students, especially as a means to reveal support (Luecke, 2011; Luecke, 2018, Ullman, 2018). Overall, basic tenets of GAM advocate that a) we allow children and teens to take the lead in identifying and expressing gender, and b) to provide support (or affirmation) of this identity (Ehrensaft, 2017). Unlike previous pathological conceptualization of gender diversity, the GAM defines *gender health* as "…the opportunity for a child to live in the gender that feels

most real and/or comfortable for the child and the ability for children to express gender without experiencing restriction, criticism, or ostracism" (Keo-Meier & Ehrensaft, 2018, p.13).

Commonly, research targeting transgender youth that draws upon developmental systems theory applies the minority stress model (Eisenberg et al., 2019) to explicate how individuals experience, perceive, and cope with vulnerability and privilege within a system ecology. By itself, the minority stress model (Meyer, 2003) has been applied to research among transgender youth in and out of school spaces to reveal how social stress specific to gender diverse and LGBT youth is associated with well-being (Hatchel & Marx, 2018; Testa et al., 2015; Breslow et al., 2015; Coulter et al., 2016). Based on this clinical model of stress, Testa's et al. (2015) gender minority stress model intended for gender diverse youth proposes that distal stressors have a negative influence on psychological well-being, with proximal stressors mediating their relationship (Testa et al., 2015). For example, Blais, Gervais, and Herbert (2014) apply this model of stress to the school domain, demonstrating that the ontological process of internalized homophobia significantly accounts for part of the variation in predicting self-esteem from peer homophobic bullying. In contrast to the risk factors approach, the measurement and structural model used in the current study departs from the mediation model based on Testa et al., 2015 by focusing on protective factors, individual and group level, as moderators in predicting transgender student outcomes (self-esteem; school belongingness) from school climate. Correspondingly, in contrast to the risk factors approach, in the current study, the school climate measure was informed by literature sampling transgender students which highlights support and protection specific to trans

13

identified middle and high school students, and equally, fosters a culture of gender equity and inclusion among the student body at large.

School Climate and Self-Esteem

Recent school-based research that compares group outcomes by gender identity showed mixed findings in measuring the relationship between school supports and student reported self-esteem. For example, using data from *The Outlook Study* in Waterloo Region, Ontario, Canada, Taylor et al. (2020) found that social support from friends was associated with higher report of self-esteem for cisgender LGB students, but not for transgender students. These results suggest that the relationship between school supports that encompass school climate, such as peer support, and self-esteem is more complicated among transgender students, moreover, that there are intermediary processes yet to be revealed.

Research studies conducted with LGBT students attending middle school through college shows that risk from the peer community, peer victimization (Kosciw et al. 2013), similarly, homophobic bullying (Blais, Gervais, & Hebert, 2014) has a direct negative impact on students' self-esteem. Findings from studies by Kosciw et al. (2013) and Blais, Gervais, and Herbert (2014) show that peer victimization is negatively related to students reported self-esteem, however, Blais, Gervais, and Herbert (2014) more narrowly focus in on homophobic bullying in this relationship, excluding victimization based on gender identity. Moreover, results show that the direct and indirect effect of homophobic bullying on self-esteem is negative, and that internalized homophobia partially mediated this relationship (Blais, Gervais, and Herbert, 2014). Furthermore, Kosciw et al. (2013),

unlike Blais, Gervais, and Hebert (2014), isolate four protective factors that inform school climate for LGBT students, then measure the direct relationship of each with student self-esteem, and extent to which victimization based on gender expression moderates these relationships. In line with most school-based literature that assess risk among LGBT students, victimization based on sexuality identity was also included in the model. Emerging from the four school supports examined, moderation results suggest that inclusive curricula positively influences self-esteem within schools with students who are victimized based on gender expression. In addition, supportive educators and comprehensive anti-bullying/harassment policy were both related to student reports of higher self-esteem (Kosciw et al., 2013).

School Climate, School Belongingness, and School Connectedness

Due to the overlap in the conceptualization and in the definition of terms of school belonging and school connectedness in school-based literature, the adolescent school climate literature reviewed in the following section includes research using measures from both constructs. However, unlike some school connectedness models, school belongingness can be conceptualized as a psychological construct related to the 'self' (Arslan & Duru, 2016), so emphasis is placed on individual experience in an interpersonal context. Moreover, Arslan and Duru (2016) explain one approach to school belonging conceptualized and modeled after two domains, 1) experiences of valued involvement, and 2) fit between a person and their environment (Hagerty et al., 1992 as cited in Arslan & Duru, 2016, p.1045). At the same time, many school connectedness measures are conceptualized almost synonymously (e.g., Barber & Schluterman 2008;

15

Lee & Robbins, 2000), as a multi-dimensional construct including the 'self' domain. For example, Barber and Schluterman (2008) break school connectedness into two domains corresponding with a relational and autonomy component that 1) "…supposes a connection or bond to others…" and 2) "…that refers to how individuals feel when they are valued within a relationship " (as cited in Carroll, Bower, & Muspratt, 2017). Overall, Caroll, Bower and Muspratt (2017) explained that there is little consensus in how social connectedness is operationalized, rather researchers approach the construct from different perspectives (e.g. Jose et al. 2012; Karcher & Sass, 2010; Lee et al., 2001 as cited in Carroll, Bower, & Muspratt, 2017). Similarly, Hagerty et al. (1992) explains "sense of belonging" as the experience of personal involvement in a system or environment so that persons feel themselves to be an integral part of that system or environment" (as cited in Arslan & Duru, 2016 p. 1045). Furthermore, research encourages that sense of belonging, and similar constructs like connectedness, should be understood within a systems framework, "in the context of person-environment relations" (Arslan & Duru, 2016, p.1035). Similarly, newer approaches to capturing social connectedness follow a systems organization as a means to capture both personal (autonomy) and relational components across multiple contexts, such as the school, home, and community (Carroll, Bower, & Musspratt, 2016).

Recent school-based research that compares group outcomes by gender identity demonstrates the complexity of assessing multiple intersecting identities in measuring the relationship between school supports and self-report of school connectedness. Coulter's et al. (2020) study, based on a large sample of middle and high schoolers who completed the 2013-2014 *California Healthy Kids Survey (CHKS),* reveals intersectional differences

by gender identity, sexual identity, and race, in four protective school assets, including school connectedness. In this way, relationships between minority status variables, including gender identity, and four protective assets, including school connectedness were assessed. In predicting school connectedness, results showed a significant three-way interaction between transgender status, sexual identity, and race, revealing that transgender adolescents who are Hispanic, and identified "LGB only" had poor perceptions of school connectedness (Coulter et al., 2020). Similarly, a second three-way interaction by intersection of minority status, shows that transgender identity, "LGB only", and students with lower levels of parent education, also significantly related to negative reports of school connectedness among this demographic. Overall, this study demonstrated that students with multiple marginalized identities were most stigmatized in school spaces, especially among transgender identified students, and they reported fewer school assets, including poor perceptions of school connectedness. Moving forward, Coulter et al. (2020) suggested research should explore how different types of "…stigma and discrimination at multiple sociological levels converge to impact dual and multiple minority populations…" and to measure protection in this ecology (p. 327).

Similarly, research shows that gender facilitative practices promote school connectedness among LGBT(QIA) (Bullock, 2018) and cisgender (Day, Snapp, & Russell, 2016) samples when they report on their high school experiences. First, among a small sample of LGBT(QIA) students, Bullock's (2018) qualitative study identified three protective factors from students reports which enhanced school connectedness, including diversity of professional development for school staff, the need for more support staff, and group and mentorship opportunities. In line with Bullock's (2018) research initiative

to isolate supportive practices in contributing to student's perceptions of school connectedness, Day, Snapp, and Russell (2016) results show that supportive practices (as reported by teachers) were positively related with student report of school connectedness, however, punitive practices were not. In addition, when homophobic bullying was including in the model as a predictor, only supportive practices moderated the negative association between homophobic bullying and school connectedness, while punitive practices did not. Although gender identity and sexual identity were not reported, so group outcomes cannot be compared, results indicate that students who experience more homophobic bullying reported higher school connectedness only when they attended schools in which teachers reported fostering and applying more supportive practices (Day, Snapp, & Russell, 2016). Day, Snapp, and Russell (2016) pointed out that school connectedness is lower in schools that have an absence of supportive policy, whether not or bullying is present. These findings underscore literature that proposes a reevaluation of punitive policies (Ullman, 2018) in facilitating school climate, especially in promoting school connectedness, and creating protection in the context of bullying (Day, Snapp, & Russell, 2016).

Tuite (2020) pointed out that there has been little research carried out on the intersection of gender identity (and gender expression) as it relates to school belonging and related wellness outcomes, despite the high risk that peer socialization poses to gender diverse students in school spaces (Kosciw et al. 2018). To attend to this gap in the literature, Tuite (2020) examined the relationship between sense of belonging (encompassing 3 sub-domains competence, autonomy, and relatedness) and life satisfaction, measuring group differences by variations in gender identity, in a high

school for high ability students. Results show that gender and sexually diverse high schoolers uniquely benefited from the specialized environment of the new academy. Moreover, among the three dimensions of belonginess identified, changing schools contributed to the highest positive percent increase in the sub-domain of autonomy (Tuite, 2020). These findings are in line with conclusions from school-based research sampling transgender students that links self-agency (as it relates to gender) to connectedness with others, such as the peer community. Tuite (2020) explained that "a student's sense of autonomy grows when the student is provided with opportunities for personal growth within an environment where they not only feel systemic support, but also feel empowered to make decisions, pursue interests, and be who they genuinely are" (Deci et al., 2006; Legate, Ryan, & Weinstein, 2012 as cited in Tuite, 2020, p. 122).

Like Tuite (2020), the research conducted by Bockting et al. (2018) and Heck et al. (2014) was instigated by the high risk that peer socialization poses to school belongingness among gender diverse students in school spaces (Kosciw et al. 2018). The results of Bockting et al. (2018) and Heck et al. (2014) results demonstrate that more sense of belongingness predicts less peer victimization, however, cross-sectional data limits conclusions that can be drawn in the opposite direction. Therefore, results encourage us to consider how peer group inclusion, equally close friendships, contribute to the amount of peer victimization experienced and reported. Furthermore, in the online survey conducted by Jones et al. (2016) in Australia, the authors found that transgender high schoolers with supportive peers at school were not only less likely to experience different types of harassment and discrimination, but were less likely to report experiencing social exclusion.

School Climate Measures

To advance understanding and measurement of school climate, and corresponding school policies centering on gender for transgender adolescents, it is necessary to consider a multi-contextual view of school climate. When organized in an ecological-transactional model, literature that highlights support among transgender students in middle and high school shows that protection fostering positive school climate is multi-faceted, both proximal and distal factors each playing an important role (Scrofani et al. *Under Review*). Similarly, drawing on themes that emerged from a review of literature organized by Bronfenbrenner's ecological framework on LGBT support in school, Leung et al. (2022) concluded that a collaborative whole school approach may be the benchmark of support for LGBT students. Albeit, Leung et al. (2022) admitted that multi-contextual support may be idealistic and unrealistic for some schools to obtain, depending on the environment. At the same time, proximal support systems, such as supportive educators, emerged as a central form a protection in the school ecology in each review (Leung et al. 2022; Scrofani et al. *Under Review*). Beyond this, research shows that a multi-level conceptualization of school climate can be used as a tool to predict transgender student wellness outcomes, and to explore if protection from intermediary forms of coping (such as transgender pride or youth activism) are more or less beneficial for students depending on the extent to which school climate is positive.

In the US, the United States Department of Education (USDOE) uses three broad domains to define school climate: engagement, safety, and the environment, (US Dept. of Education, Retrieved March 2022), each comprise of sub-domains used to understand 6-

12th grade student, faculty, and parent perceptions of school climate (Lindstrom-Johnson et al., 2017; Bradshaw et al., 2014). Likewise, indicators of many school climate measures used for secondary school students are modeled after these three domains, and correspondingly, touch upon each. For example, the United States Department of Education School Climate Survey (EDSCLS) scoring is based off a composite of 13 subdomain topical areas consolidated by domain scores for engagement, environment, and safety (EDSCLS, Wang, Murphy, & Kantaparn, 2016). Similar to the EDSCLS student instrument, the School Climate Assessment Instrument (SCAI-S-S) (Shindler et al., 2009; Shindler et al., 2016) and the Comprehensive School Climate Inventory (CSCI-S) student surveys (are two of many examples that) touch upon the three-domain model recommended by the USDOE. The SCAI, however, is more extensive including indicators about community relations, administrative leadership, and student voice (Voight & Hanson, 2014). To follow suit with the three-domain definition of school climate, indicators from the SCAI-S and the EDSCLS were used to inform created indicators and corresponding sub-domains of the proposed Gender Affirmative School Climate Scale (GASC) in the current study. Although the breadth of topic areas included on measures like the EDSCLS (Wang, Murphy, & Kantaparn, 2016) cover student perception of their school's respect of diversity across demographics, on most school climate measures questions specific to gender diversity are either missing or limited. Echoing the themes outlined by the USDOE, researchers have created school climate measures to help capture what supports LGBT students (DePedro, Lynch, & Esqueda, 2018; Coulter et al., 2016; Toomey, McGuire, & Russell, 2012), but the facilitation of gender (i.e. equity, inclusion, and education) in school spaces has yet to be isolated in a

21

school climate measure. Moreover, there is no validated measure that captures dimensions of a gender affirmative school climate targeting support for transgender adolescents, that can also be used for the student body at large. To fill this gap, the current study developed a school climate measure that targets domains of support for transgender high school students, at the same time, overlaps with areas of support for cisgender, and other non-trans identified high school students.

Aside from the breadth of topics covered on secondary school student school climate measures, school climate measures commonly base assessment on respondent's level of agreement on statements about the school or classroom (Brand et al., as cited in Voight & Hanson, 2014). At the same time, sometimes indicators probe about respondent's own experiences, thus ask about their own attitudes or behaviors (Voight & Hanson, 2014). As a result, the current study's school climate measure was created using a 7-point Likert scale based on agreement. Most questions ask about level of agreement on statements about school spaces and supports for the community at large. However, there are also indicators that probe about personal experience, including proximal processes at the ontological and micro-level, which ask respondents about their own attitudes or behavior. For example, *At my school students of all gender identities feel listened to, represented, and that they have a voice* (Shindler et al., 2009; Shindler et al. 2016, SCAI-S-S), (adapted from the SCAI-S-S to target gender identity), asks the respondent to speak for the student body at large. In contrast, *When I'm at school I have the opportunity to be free to live in the gender that feels most real and comfortable* (GAM definition of gender health, Keo-Meier & Ehrensaft, 2018; pg. 13) asks the respondent to speak directly to their own experience.

Next, the school climate measure's indicators are driven by the gender affirmative model (GAM) because its dialectical approach highlights what schools can do to help, and it corresponds with new research that shows that expanding this clinical model to the school domain promotes transgender wellness beyond the home (Luecke, 2011; Luecke, 2018; Goodrich & Barnard, 2018; Ullman, 2018). Moreover, adopting a gender affirmative approach to assess school climate is necessary because the school shows to be a significant ecology for gender development, especially among individuals most at risk. Research demonstrates that creating a positive school climate for transgender students requires that schools, above all, are *pro-active*, and prioritize gender equity, inclusivity, and education as a core mission to the school at large (Ullman, 2018; Luecke, 2011; 2018; Jones et al. 2016). Furthermore, extending the GAM to the school domain encourages school professionals to be conscious of their ability to promote or restrict students' self-agency to identify and be affirmed in the gender they are most comfortable in. This argument echoes the sentiment of the GAM applied to parent-child research which encourages parents to follow their child's lead in affirming their identities, and to adapt to change (Hill & Menvielle, 2009; Hill et al., 2010). Accordingly, in research conducted by Ullman (2018) and Luecke (2018), self-agency emerges as an important feature of protection for transgender students in schools, and has been shown to facilitate positive school climate. As a result, in the current study "agency" was initially chosen as the topical domain that encompasses the proposed ontological latent factor of the GASC scale, informing school support at the individual level. Later on in scale development, "agency" emerged as a latent subject domain among items across contextual levels, moreover, did not show to be specific to the individual level as first hypothesized.

School-based research shows that the home plays a significant role in contributing to school climate for transgender students (Kosciw et al. 2018; Malpas, Glaeser, & Giammattei, 2018). Likewise, GAM theorists assert that school staff's correspondence with the parents of transgender students is a key factor in informing and supporting their well-being at school. Since the home emerges as an overlapping ecology for transgender students in contributing to their school climate, the proposed scale indicators encompassing the meso-system latent factor only focus on one topical domain, the home.

Transgender Highschool Student Risk and Resilience

In many middle and high schools high rates of bullying and victimization targeting transgender and other gender diverse students has pushed regional districts to implement policies and develop programs that work to create a safe space for transgender and other gender diverse students. Across focus groups of transgender students ages 12-23, McGuire et al. (2010) explained there was almost a universal agreement that schools are a not a safe space for transgender and other gender diverse youth. Related, in Kosciw et al. (2016) analysis of the *2015 School Climate Survey (GLSEN)*, 65% of transgender student report being verbally harassed, while 25% were physically harassed. Among those that were harassed, approximately three quarters expressed that they did not report incidents to school staff because they doubted or feared staff's ability to help (Kosciw et al., 2016). More recently, results of the *2017 School Climate Survey (GLSEN)* show a similar trend, 83.7% of transgender identified students reported victimization at school based on gender identity, while 83% of transgender students reported feeling unsafe based on their gender identity (Kosciw et al., 2018). Overall, transgender students

reported having a more hostile school climate compared to non-binary, genderqueer, and LGB cisgender students, and approximately half of all students sampled report hearing frequent negative remarks about being transgender (or about transgender people), like "tranny" or "he/she" (Kosciw et al., 2018). Furthermore, compared to previous GLSEN surveys, the number of reported negative remarks heard about gender expression from teachers and staff increased to approximately 71% (Kosciw et al. (2018). In a similar vein, data shows that improper pronoun use by teachers and staff persists in both 2015 and 2017 School Climate Surveys (GLSEN).

Similar to findings based on recent GLSEN surveys, results from one of the largest known samples of transgender youth in the US, *the California Healthy Kids Survey (CHKS)*, also demonstrate that there are gaps in school support among gender diverse teens, and that the most apparent and urgent need to surface generally is bullying and victimization. Moreover, the results of Day, Perez-Brumer, and Russell (2018) show that transgender middle and high school students are more likely to experience biased-based bullying and victimization compared to cisgender students, and report more negative perceptions of school climate, overall. Research abroad sampling transgender and gender diverse students demonstrates a similar pattern, such as Jones et al. (2016) mixed methods study that investigates the school experiences of Australian transgender (and other diverse) students ages 14-25 years old. In line with the results of past GLSEN School Climate Surveys (Kosciw et al., 2016; 2018) approximately 65% of students report verbal abuse based on gender identity and expression, while 21% report physical abuse based on gender differences (Jones et al., 2016). At the same time, Jones et al. (2016) emphasizes that the survey questions and online interviews with transgender

students (performed in real-time) focused on asking about school supports and "revealed that while most constructions of transgender and gender diverse students in research to date focus on victimization (Jones, 2013), it is also possible to reframe such students as often empowered individuals who advocate on their own (and others') behalf, in ways that promote their own well-being but also fulfil a complex social duty" (Jones et al., 2016, p.168). In this way, more proximal modes of coping that emerged include participation in activism, supportive classmates, and teacher support (including proper pronoun use). At the same time, supports more distal to the students showed to be protective, such as not adhering to a gender segregated culture (and spaces) and "sexuality and puberty education class". Similarly, in McGuire et al. (2010) transgender students in focus groups called attention the need for distal systemic action, in suggesting a need for state-wide coalitions to inform staff interventions. Jones et al. (2016) concludes that policy guidelines and corresponding faculty training should be based on a multi-level framework to accommodate student diversity and social inclusion, specific to each student's needs, and that such accommodations must go beyond the traditional model for gender norm enforcement (and gender segregation in these spaces).

CHAPTER 2

THE CURRENT STUDY

Drawing on the multi-contextual quality of school climate for transgender students identified in the literature (Scrofani et al., *Under Review*) and the gender affirmative model (Ehrensaft et al. 2011), the first goal is to create a school climate scale focusing on the facilitation of gender (interrogating diversity, inclusion, and equity) in

school spaces. In the past researchers have created school climate measures to help capture the factors that support LGBT students (DePedro, Lynch, & Esqueda, 2018; Coulter et al., 2016; Toomey, McGuire, & Russell, 2012), but the facilitation of gender (i.e. equity, inclusion, and diversity) in school spaces has yet to be isolated and assessed in a school climate measure. Furthermore, because we lack a tool to gauge school climate specific to the needs of transgender students, there is no reliable and valid way to capture how well schools are supporting transgender students in their diverse identities.

For the first step of scale development a pilot study was conducted to generate and establish indicators of gender affirmative school climate among high school students, prioritizing the needs of gender diverse youth, especially transgender students. To create a scale that is both psychometrically fit and developmentally appropriate (Syvertsen, Wray-Lake, & Metzger, 2015), the pilot study followed a two-step mixed methods procedure, including 1) a cognitive interview, and 2) a self-report survey of the drafted items for the proposed scale. The first pilot assessment included interview prompts which asked participants about their understanding of each of the proposed indicators on the Gender Affirmative School Climate (GASC) scale. At the same time, to establish what content is in and out of bounds some interview prompts were designed to stimulate inductive reasoning. So, participants were also asked to generate new questions. Following revisions between steps in the pilot data collection procedure, I applied Exploratory Factor Analysis (EFA) to establish latent domains, model fit, and provide a basis for refinement of the school climate scale again in the primary study. See Methods section for more details on the pilot procedure.

Next, the second main goal of the study is to confirm the proposed model for the school climate measure, and to investigate the relationships between the proposed scale and student outcome measures. To do this, following the two-step pilot procedure, data was collected in a third study, or the primary study. Scale development procedure continued by applying Confirmatory Factor Analysis (CFA) to the primary sample data to examine if latent structure and relationships among indicators resembled the measurement model drawn from the pilot 2 sample data. Then, Measurement Invariance using multiple-group CFA procedure was carried out to examine if the proposed school climate instrument is invariant across transgender and non-transgender high school students. Last, student outcomes self-esteem and school belongingness, and potential moderators contributing to this relationship, including transgender pride, youth activism, and similarity to peer group gender, were added to the model.

In this way, I first examined the direct relationship between gender affirmative school climate and students' self-esteem. Literature has shown that LGBT students who are supported in their gender identities at school demonstrate more confidence in themselves (Taylor et al, 2020; Kosciw et al., 2013). More research is needed which samples transgender students to isolate the protective and risk factors corresponding to school climate that inform self-esteem outcomes among this population. Moreover, more research is needed to determine how school climate overall contributes to transgender students' self-esteem, given the likelihood of social strain in other spaces, such as in the home or neighborhood, informing this relationship. As a result, OLS regressions and structural latent SEM models including student outcomes and potential moderators therein were each carried out separately by gender group (transgender identified or non-

transgender identified), to help examine if school climate informs self-esteem uniquely among transgender students.

For the outcome school belonging, I examined the direct relationship between gender affirmative school climate and students' perception of school belongingness. Literature has shown that supportive practices precipitate positive (LGBT) student perceptions of school connectedness (Day, Snapp, & Russell, 2016). Similarly LGBT students suggest staff be more proactive to help promote a sense of school belonging, such as including diversity professional development for school staff, encouraging group and mentorship opportunities (Bullock, 2018). In the current study, I compared the relation between gender affirmative school climate and school belonginess for transgender and for non-transgender students by modeling each sub-sample separately.

I assessed moderators in these relationships. More specifically, drawing on the multi-contextual quality of school climate for transgender students identified in the literature (Scrofani et al., Under Review), I aim to measure which individual (transgender pride) and group level factors (youth activism; similarity to binary and non-binary gender identities) moderate the relation between gender affirmative school climate and self-esteem, and the relation between gender affirmative school climate and school belongingness. Transgender student outcomes were compared to that of non-transgender identified students to isolate interactions between school climate and similarity to peer group gender indicators that may be particularly protective for transgender students in influencing the relationship between gender affirmative school climate and student wellness outcomes (self-esteem; school belongingness). Although there continues to be a trend in the literature that prioritizes the study of risk factors, more recently attention in

the field has switched to identifying factors that promote resilience among this at-risk group (Gower et al., 2018; Taliaferro, McMorris, & Eisenberg, 2018; Hatchel & Marx, 2018; Jones et al., 2016; McGuire et al., 2010). In line with this goal, I aimed to explore how trans youth develop coping skills to navigate difficultly expressing their identities, find acceptance, and be supported in their private and public lives encompassing the school ecology.

Finally, I included short answer questions on the primary study that are designed specifically for the sub-sample of transgender high schoolers. The first aim of the short answer questions seeks to expand on, and clarify what dimensions encompass gender affirmative school climate among transgender students. In this process, data was collected on whether students' have disclosed their gender identity at school. Transgender students that are "out" at school were asked about these experiences, more specifically, about how they received support in this process. Next, the second aim of the qualitative portion is to shed light on how school climate informs transgender students perceived school belongingness, and self-esteem. See appendix for a complete list of questions included in the primary survey, including qualitative short answer questions which appear only for participants who report that they are transgender identified.

Hypotheses

Consistent with the protective themes that emerged in an ecological-transactional review of the literature sampling transgender students in middle and high school (Scrofani et al., Under Review), I anticipate that five latent variables will encompass the proposed gender affirmative school climate measure, including ontological, micro, meso,

and macro-system levels of the school ecology. Figure 1 shows a diagram of the proposed latent constructs and sub-domains within each. Indicators for each latent construct were based on sub-domains identified in Figure 1.0. See appendix for a complete list of indicators that encompass the gender affirmative school climate scale and sub-domains therein.
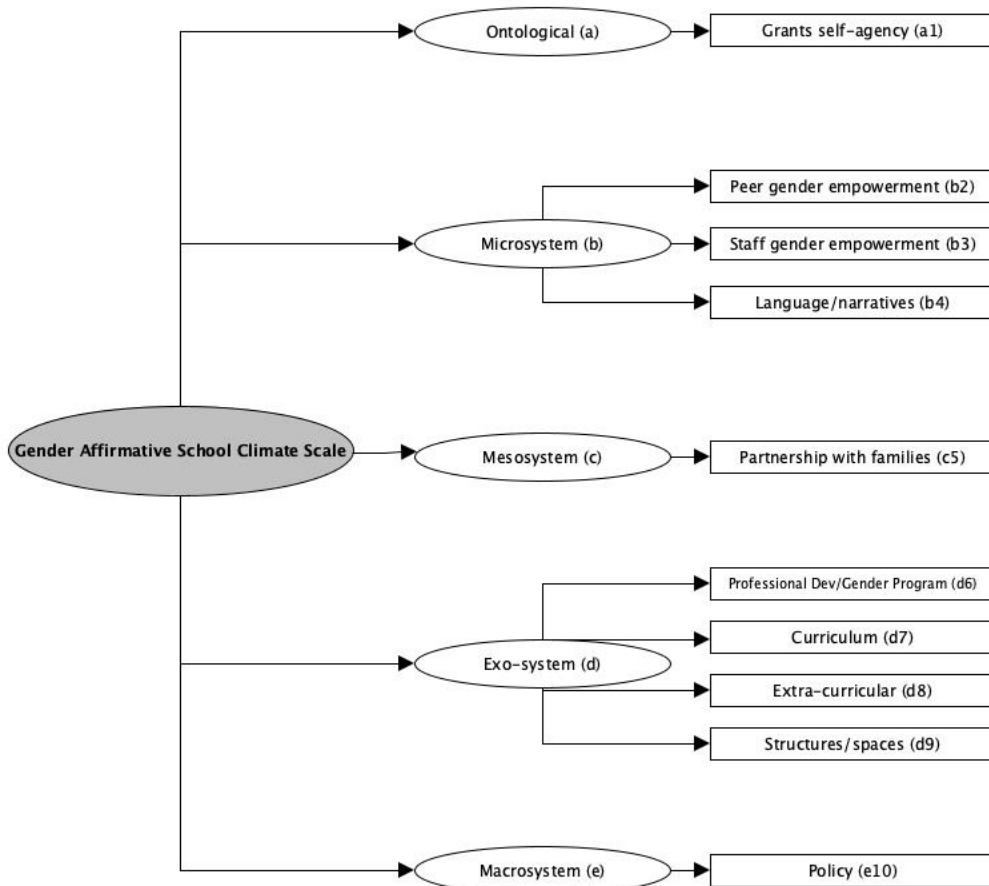
(Figure 1.0)

Direct Relationships between Proposed Gender Affirmative School Climate Indicators and Student Wellness Outcomes (self-esteem; school connectedness)

31

H1a: I anticipate that students who self-report more gender affirmative school climates will self-report higher self-esteem (ASQ; Hafekost et al., 2015). More specifically, I anticipate that OLS regression analyses will show that gender facilitative school climates will relate to higher self-esteem, controlling for grade level. I anticipate this relationship among all sample participants.

H1b: In addition, I anticipate that latent sub-domains corresponding with proximal levels of the GASC will show to be more associated to student self-esteem, as compared to more distal levels. Some research in the literature that assesses transgender school climate shows that proximal factors informing school climate, at the ontological and micro levels, promote student wellness outcomes more so than that of distal levels, due to their immediate accessibility (Scrofani et al., Under Review). However, more research on this topic is needed.

H2: I anticipate that students who report more gender affirmative school climates will report higher school belongingness (PSSM; Goodenow, 1993). More specifically, I anticipate that regression analyses will show that gender facilitative school climates relate to more positive perceptions of school belonging, controlling for grade level. I anticipate this relationship among all sample participants.

Moderation by Protective Factors (individual and group level); Path Diagrams of Proposed Moderation Models (H3-H6)

H3a-b: At the individual level, transgender-identity related pride (TIS; Pride sub-scale; Bockting et al., 2020) will be included in the model as a moderator for the trans identified sub-sample. I anticipate that higher reported levels of transgender pride will strengthen the relationship between gender affirmative school climate and student wellness outcomes (self-esteem; school belongingness). Conversely, I anticipate that lower levels of pride will weaken the relationship between gender affirmative school climate and student wellness outcomes. Including variables to the model that capture ontogenic processes add value by their capacity to "describe whether or how individuals utilize or interact with" (Gaias et al. 2017) school resources, and to capture individual coping with social strains such as bullying/victimization.
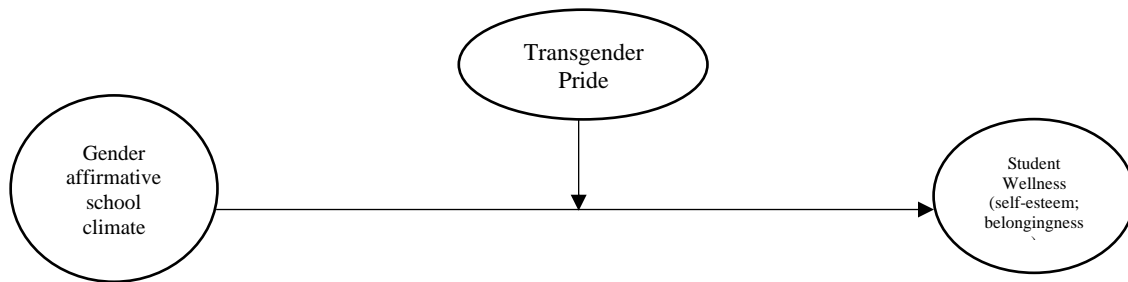
H4a-b: At the group level, involvement in activism (YII; Pancer et al., 1997) will be included in the model as a moderator. I expect that relationship between gender affirmative school climate and student wellness outcomes to differ for students who are engaged in activism from those who are not engaged in activism. More specifically, I expect that higher levels of youth activism will strengthen the relationship between gender affirmative school climate and student wellness outcomes. Conversely, I expect that lower levels of youth activism will weaken the relationship between gender

affirmative school climate and student wellness outcomes. I anticipate this relationship among all sample participants.
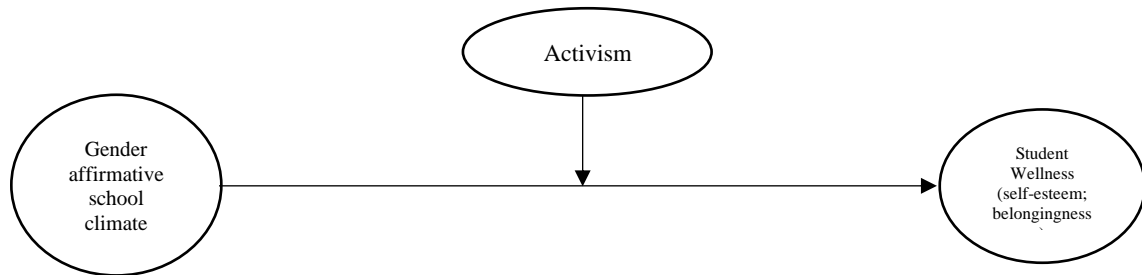
H5a-b: At the group level, <u>similarity to peer group gender (</u>Martin et al. 2017) will be included in the model as a moderator. The following regressions hypotheses were first tested among transgender identified participants, and then the process was repeated among non-transgender identified participants. I tested each interaction between sim to peer gender groups (girls, boys, and non-binary) and gender affirmative school climate (GASC) corresponding with binary and non-binary categories. Across non-transgender and transgender identified participants, I expect that higher levels of 'similarity to peer group gender' (including binary and non-binary groups) will strengthen the relationship between gender affirmative school climate and self-esteem.
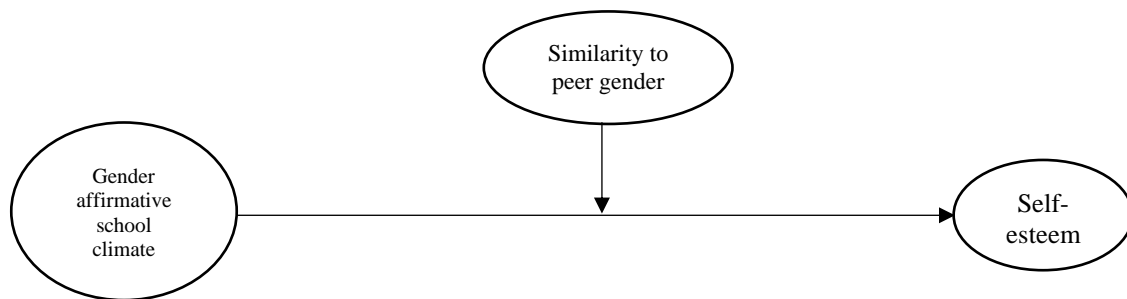
H6a-b: The following regressions hypotheses were first tested among transgender identified participants, and then the process was repeated among non-transgender

identified participants. I tested whether each category of similarity to peer gender groups (girls, boys, and non-binary) corresponding with binary and non-binary categories interacted with gender affirmative school climate (GASC). Across non-transgender and transgender identified participants, I expect that higher levels of 'similarity to peer group gender' (including binary and non-binary groups) will strengthen the positive relationship between gender affirmative school climate and school belongingness.
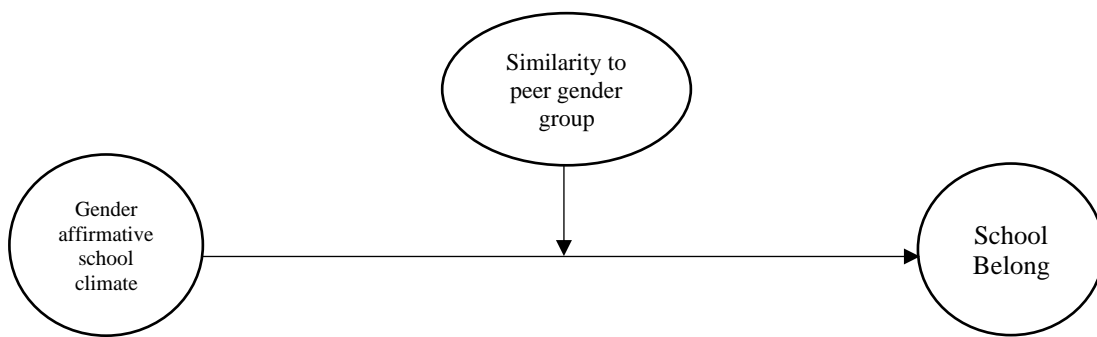
Supplemental Data Analyses: Atemporal Mediation by Protective Factors (individual and group level); Path diagrams of Proposed Mediation Models (H6-H8)

H7: At the individual level, <u>transgender pride</u> will be included in the model as a mediator. I anticipate transgender pride will mediate the positive relation between gender affirmative school climate and student wellness outcomes (self-esteem; school belonging). Moreover, based on the gender affirmative model, I expect that trans adolescents who can count on school spaces to support them in their gender identities (i.e. in prioritizing gender equity, inclusion, and education to foster a gender facilitative climate), will report higher sense of pride in their identities (higher gender-related pride),

and will self-report more positive student wellness outcomes (self-esteem; school belonging).
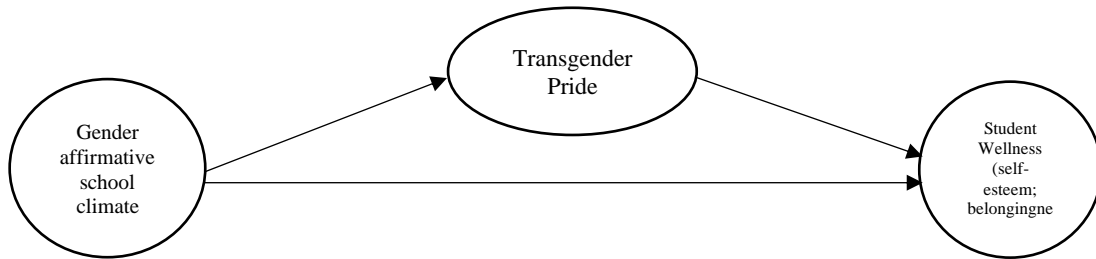
H8: At the group level, <u>involvement in activism</u> will be included in the model as a mediator. I expect that adolescents who can count on school spaces to support them in their gender identities (demonstrated by higher GASC scores), will show more involvement in activism, and will self-report more positive student wellness outcomes (self-esteem; school belonging). Across all participants, I anticipate involvement in <u>activism</u> will mediate the positive relation between gender affirmative school climate and student wellness outcomes (self-esteem, school belonging).
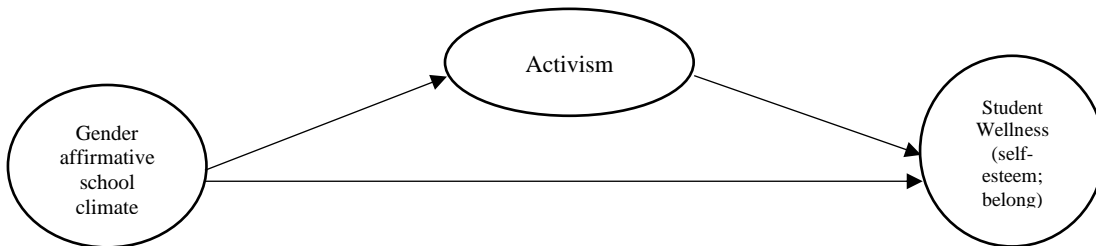
H9: At the group level, <u>similarity to peer group gender</u> will be included in the model as a mediator. Given the salience of gender in the school ecology, I expect that transgender adolescents that can count on school spaces to support them in their identities (demonstrated by higher GASC scores) will feel more similar to gender peer groups, and will self-report more positive student wellness outcomes (self-esteem; school belonging). Likewise, for non-transgender identified participants, I anticipate similarity to peer group

gender will mediate the relation between gender affirmative school climate and student

wellness outcomes (self-esteem, school belonging).However, I anticipate that exclusively

among sample members that identify as "non-binary", across transgender and non-

transgender identified students, similarity to binary group gender peers will not mediate

the relationship between gender affirmative school climate and student wellness

outcomes.
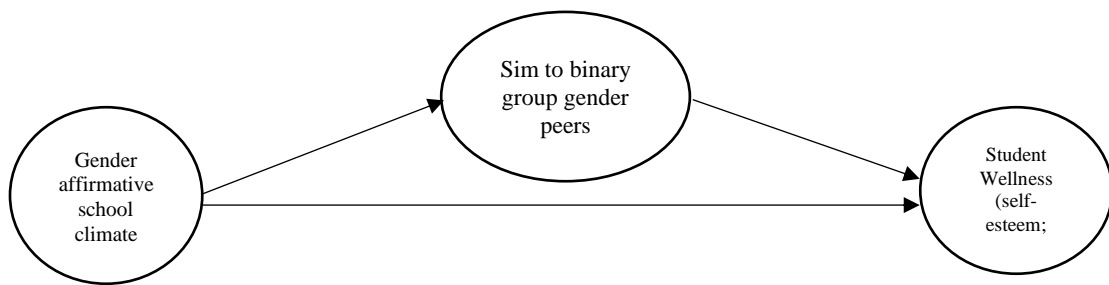
Methods

The following sections are organized by two main sub-headings, "pilot study" and

"primary study", so that details on the sample and procedure of each can be organized

accordingly. The proposed factor structure and pattern of measured variables are based

on an a priori hypothesis which proposes that school climate of gender is a multi-level

ecology. Moreover, the scale development procedure was guided from a body of research

that highlights protection for transgender students whom are often the most at-risk

(Scrofani, Under Review). Cognitive interviews were first performed to facilitate the

creation of scale questions during the Summer of 2022. Proposed items were then applied

to self-report surveys in the pilot (Fall 2022) and primary data collection phases (Winter

2022-23), evolving after edits from each stage. Two separate samples were drawn to

facilitate the scale development process (Germain, 2006, p.896), applying Exploratory

Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to establish latent

domains based on the pilot data sample, and CFA again to confirm this structure with the primary data sample.

Pilot Study

A two-step mixed methods procedure was applied to create a scale that is both psychometrically fit and developmentally appropriate (Syvertsen, Wray-Lake, & Metzger, 2015) measure of gender affirmative school climate for high school age students (ages 15 through 19). First, one-on-one cognitive interviews were performed over two months (June-July 2022) drawing on a small sample (N=12; approximately 50% (6) self-disclosed cisgender (50% (3) self-disclosed cisgender male; 50% (3) self-disclosed cisgender female); 25% (3) self-disclosed non-binary; 25% (3) did not self-disclose gender or binary identities) of high school students. Cognitive interviews were held over Zoom, and were guided by the proposed GASC scale indicators. Questions prompts to determine overall reading comprehension and understanding of proposed questions and content were asked in this process. Second, after initial revisions on survey items were made following the cognitive interview procedure (Pilot 1), the self-report study (Pilot 2) was administered online applying the revised GASC scale items (N= 758; approximately 54.5% (N=413) transgender identified).

Initial creation of scale items of the proposed GASC measure was based on research from two domains, a) research that identifies school supports for gender diverse youth, as well as, b) literature on the psychometrics of school climate, (focusing on scales that follow the USDA's three domain model, and some that push beyond this model by including more climate domains). See the section on validity for more information on the

deductive process to generate questions that were used as fodder in the cognitive interview procedure. While all items are developed by the author of this study, some of these items are not "original", but are either "adopted" or "adapted" from previous research (Syvertsen, Wray-Lake, & Metzger, 2015). When appropriate, references corresponding to each item are cited in the appendix, and indicate if the item has been either "adapted" or "adopted" from previous literature. More specifically, Syvertsen, Wray-Lake and Metzger (2015) define *adopted* items as "drawn directly from the existing literature", whereas *adapted* items are "heavily revised from existing sources or written by taking inspiration from the existing literature" (p.5). Aligned with Syvertsen, Wray-Lake, and Metzger (2015) definition of the term, "adapted" items were changed to follow the current project's theoretical aims, and corresponding research questions, and to accommodate the reading abilities of the average high school student.

Pilot Sample Overview

Sampling procedures for both the pilot and primary study samples attempt to recruit a representative sample of high schoolers based on the population of high school students in the United States (US). High school students between the ages of 15 – 19 years of age were eligible to complete the cognitive interviews, pilot 2 self-report, and the primary study. See primary study sample section below for more details on sample recruitment for the main study. The pilot study encompasses two sub-samples, the cognitive interview sample (N=12) recruited in the first step of the pilot procedure, and the self-report sample (N=758; approximately 55% transgender) recruited in the second step of the pilot procedure.

Cognitive Interview Sample - Pilot 1

Participants (N=12; approximately 50% (6) self-disclosed cisgender (50% (3) self-disclosed cisgender male; 50% (3) self-disclosed cisgender female); 25% (3) self-disclosed non-binary; 25% (3) did not self-disclose gender or binary identities) that participated in each one-on-one cognitive interview held online over Zoom were first recruited online. Instagram advertisements (using Meta for Business) were created to circulate the recruitment script and link to informed consent. After completing an online informed consent, participants that were interested in being interviewed clicked a link to toggle to a new window to make an appointment to be interviewed at time they select from the online scheduler (Calendly). As an attempt to lessen anticipated regional differences in understanding of concepts, the cognitive interview sample was recruited among high school student across regions in the US. As such, Instagram recruitment parameters for location were set within the boundaries of the US. Although cognitive interview participants were not required to reveal their location, 2 participants self-disclosed that they attend high school in California, and 1 participant self-disclosed that they attend high school in Florida. (It was anticipated that students interviewed may or may not attend a high school with specific protection or guidelines for accommodating transgender students.) Participants were not required to report their grade level, however it was mandatory that their age fell within 15 - 19 years old, and that they had attended high school in the previous academic year.

Overall Instagram recruitment with online appointment scheduling for cognitive interviews spanned about two months (June-July 2022). The interview process was on-

going during this time. Each participant was rewarded with a $20.00 Amazon gift card at the completion of the interview process.

Self-Report Sample - Pilot 2

Prior to data collection, power analyses were run on G*Power (Faul et al., 2007; Faul et al., 2009) to estimate the target sample size for the self-report survey of the proposed gender affirmative school climate scale items. Moreover, this procedure to estimate the sample size helped to ensure that there is enough power to estimate scale indicators. Initially, I approximated that the scale would have about 30 indicators after the cognitive interview procedure. This allows for approximately 6 questions per latent domain, given the proposed five factor model. Sample size estimates were calculated using both minimal (.70) and moderate level (.80) probability values for power. In addition, effect sizes chosen to calculate sample size values were based on convention among research in the social sciences, including effect size values of .13 and .15 (e.g. Cohen et al.). First, based on a moderate level (.08) of power, and an effect size value that equals .13 ($\rho2$), the recommended sample size is 188 participants. Next, based on a moderate level (.80) for power, and an effect size value that equals .15 ($\rho2$), the recommended sample size is 163 participants. Based on results for a moderate level of power, the chosen minimum sample size was (N=200). See Appendix for power analysis output. Both pilot and primary study samples size meet criteria for power.

The total sample size for the pilot 2 self-report survey exceeded initial expectations (N=758; approximately 55% transgender). For gender identity, 117 (15.4%) participants identified as cisgender, 413 (54.5%) participants identified as transgender,

139 (18.3%) genderqueer, 39 (5.1%) agender, 49 (6.5%), "none apply to me, I identify

as…". Related, crosstabs with binary identity show that the largest percent of participants

are transgender male 231 (30.5%), followed by transgender non-binary 139 (18.3%), and

cisgender female 85 (11.2%) identified. Only 27 (3.6%) participants were cisgender

male, 19 (2.5%) participants were transgender female, and 4 (.05%) participants were

cisgender non-binary identified. While 49 (6.5%) participants did not fall within the

confines of these categories. While most participants were White, 75.5% (572), 11.3%

were 2 or more races (86), and 6.8% were Black or African American (52). Related,

14.1% (107) participants were Hispanic, Latino and/or Spanish origin. A similar percent

of students reported that they attend a high school with predominately Latino, Hispanic

and/or Spanish origin (10.3%) students. Most students reported that they attend either a

predominately white high school (43.4%; 330) or a school with a mix of ethnic

compositions, 37.4% (284). The most frequent grade level among students that completed

the survey was 11th grade (Junior) (255), followed by Seniors or 12th graders (237), then

Sophomores or 10th graders (202), and last 9th graders or Freshman (35). These numbers

coincide with age criteria for eligibility, being that high schoolers under the age of 15

were not permitted to participate. See Tables 1.1 – 1.2 for complete data on

demographics.

Instagram advertisements (using Meta for Business) were created to circulate the

recruitment script with a link to the informed consent form. The advertisements were

shown for approximately 2 weeks (September 2022), and then stopped when the target

maximum sample size was reached. As an attempt to recruit an approximately equal

amount of transgender and non-transgender identified participants with Instagram Ads,

separate advertisements were made, each with either cisgender and transgender labels. Participants that were interested in completing the survey clicked a link to toggle to a new window to complete the informed consent form. After completing the informed consent form, participants that agreed to participate clicked a link to begin the survey. Participants were awarded with a $1.00 donation gift card at completion of the survey as incentive to complete the survey and compensation for time spent. They had a choice of different vendors to donate to, including *The National Park Foundation* and *The American Red Cross*.

Cognitive Interview Procedure – Pilot 1

Survey development began by drafting survey items to be used in the cognitive interview procedure. See the section on validity for more information on the deductive process to generate questions. Interviews were held online over Zoom face-to-face, and took approximately 1 hour to complete. Survey instructions were read out a loud to participants, and participants were instructed to use a paper and pencil to write down their answer choices corresponding with the Likert scale shown on screen. Throughout, participants were verbally guided through the proposed survey questions, and were stopped intermittently for questions. The semi-structured interview script was designed to interrogate participant reading comprehension and general understanding of content from questions encompassed by each of the five latent domains (microsystem, mesosystem, etc.) proposed. Overall, the goal of questions included in the semi-structed script was to determine if the drafted items for the proposed GASC scale are developmentally appropriate, and what content is in and out of bounds for this new measure of school

climate. Also, to encourage an inductive process, prompts were included to explore high schoolers narratives about what it means to be in a school space which promotes gender inclusion, equity, and diversity, (personally, and for the study body at large). Sample questions from the semi-structured interview include 1) "Explain in a few words what you think the last set of questions focused on." 2) "Did you have trouble understanding any of the questions?", 2a) "if so, which ones and explain why?", 2b) Were there any words that were difficult to understand?" 3) "Did you feel uncomfortable reporting any questions?", 4) "Have you experienced or witnessed school supports that promote gender equity (i.e. topics in curricula that advocate for equal rights for women), inclusion (i.e. gender integrated learning versus single sex), and/or diversity (i.e. topics in curricula that educate beyond traditional gender norms) that have not been asked about?" 5) Likewise, "Have you experienced or witnessed risks in school spaces that restricts gender equity, inclusion, and/or diversity that have not been asked about?" I intended for cognitive prompts to both assess high schooler's ability to understand questions, and to accurately report on content items intend to tap in to.

Throughout the cognitive interview process (June – July 2022) qualitative feedback from each participant was recorded, and organized by topic and question prompt. Four rounds of outlines were compiled corresponding with the order participants were interviewed, with content from approx. 3 participants summarized in each outline. This qualitative data was adapted to the cognitive interview script (for example, adding items suggested by participants to try in later interviews, replacing difficult vocabulary, or dropping problematic questions) in each consecutive round. After the cognitive interview procedure, a total of 12 items were dropped from the initial 56 questions

proposed. Some (7) questions were added to sub-domains "curriculum" (3), "structures and spaces" (2), and "peer relationships" (2) touching on content suggested by students interviewed. After reflecting with my mentor on cognitive interview data, 5 more questions were added touching on the sub-domain of "peer bullying", and 5 more questions were added to assess "felt-pressure to gender norms". While the addition of more questions that probe about "peer bullying" are intended to complement peer support related questions, likewise, questions that touch on "felt pressure to gender norms" are intended to complement questions from the ontogenetic sub-domain which hone in on agency.

Finally, I met with a team of professionals to discuss the validity of the proposed items, and to help make any unresolved decisions about wording and vocabulary. This process helped to ensure that the questions are accessible to high school aged students. Changes made throughout the cognitive interview procedure to items were discussed.

Self-Report Procedure – Pilot 2

Participants filled out a self-report survey online made up of the proposed Gender Affirmative School Climate scale (GASC) indicators. Participants accessed the Qualtrics survey by clicking a link shown only for those that agreed to the informed consent form. On average, the survey took approximately 20 minutes to complete.

Next, a series of Exploratory Factor Analysis (EFA) were ran on the pilot data to establish latent domains, model fit, and to provide a basis for refinement of the school climate scale. Finally, a CFA was performed once latent domains were established. Based on the results of the pilot data factor analysis procedure, I eliminated proposed items that

are contributing to poor measurement quality. See Appendix D (pg.207- 214) for a

complete list of items dropped post cognitive interviews, and highlights and footnotes on

Table 2.1-2.2 for items dropped post pilot self-report data collections. For example,

content in item 76 (*Gender identity and/or gender expression does not prevent any*

student from attending a school dance with another student, such as the prom) may not

be accessible to younger students, including freshman, sophomores, and juniors, that

have not attended a school dance yet in the first place. As a result, item 76 was dropped

after the pilot self-report procedure. In addition item 29 (*I have friends at school who I*

freely talk to about topics that expand the traditional concept of gender, such as gender

diversity (for example advocating for non-binary and trans identities) and gender equity

(for example, challenging gender roles in the math and sciences or speaking up for

school gun violence) was dropped after the pilot self-report procedure. It is possible this

question has more unique variance compared to covariance with other indicators (loading

on factor 1, agency) because most micro-system support related questions correspond

with teacher and faculty support, with a fewer number touching on peer supports.

Primary Study

Primary Study Sample

Sampling procedures for both the main study sample and pilot study attempted to

recruit a representative sample of high schoolers based on the population of high school

students in the United States (US). A stratified (non-random quota) sampling approach

was used as an attempt to sample an equal amount of transgender and cisgender

participants. In this way, two separate advertisements, each targeting transgender identified, and cisgender identified high school students (in the US) accordingly, were circulated until a quota of each sociodemographic was obtained. An advertisement for cisgender males, cisgender females, and non-binary identified was added later in recruitment as an attempt to find more non-transgender identified participants.

Like the pilot self-report study sample, the primary self-report survey sample was gathered using advertisement parameters (Meta for Business) that target high school aged (age 15 – 19 years) living in the US. Parent consent was waived for adolescents ages 15-17. Given that many transgender adolescents have not come out to their parents, and that many transgender high schoolers remain hidden in school spaces due to risk of stigmatization, a case for parent consent to be waived by the IRB was made (Salk, Thoma, Choukas-Bradley, 2020). The Instagram platform was used to promote the survey independently, using a social media marketing approach with advertisements on Meta for Business (Facebook).

Prior to data collection, power analyses were run on G*Power (Faul et al., 2007; Faul et al., 2009) to estimate the target sample size of the primary self-report survey. Moreover, using this procedure to estimate the sample size helps to ensure that there is enough power to estimate model parameters relating scale indicators to student wellness outcomes, and measuring the impact of protective factors in this relationship. All together I approximated that the primary study would have 101 questions, including scale items on the revised school climate measure (approximately 30), and other survey items that encompass student wellness outcomes and protective factors (approximately 71). Sample size estimates were calculated using both minimal (.70) and moderate level (.80)

probability values for power. In addition, effect sizes chosen to calculate sample size values were based on convention among research in the social sciences, including values ρ2 values .13 and .15 (e.g. Cohen et al.). Chosen effect size values were also informed by squared multiple correlation values in school based research that measures the relationship between school climate (alternatively a sub-domain within, such as areas of safety or engagement) and transgender student outcomes (Colvin, Egan, & Coulter, 2019; Greytak, Kosciw, & Boesen, 2013; Hatchel & Marx, 2018); likewise, significant effect size values in this research ranges from .05 - .30 (ρ2).

First, based on a moderate level (.08) probability value for power, and an effect size value that equals .13 (ρ2), the recommended sample size is 341 participants. Next, based on a moderate level (.80) probability value for power, and an effect size value that equals .15 (ρ2), the recommended sample size is 300 participants. Finally, the target sample size (N=300) was based on calculation using a moderate level (.80) probability value for power, and an effect size value that equals .15 (ρ2). More precisely, the recommended sample size using these parameters is 300 participants. See Appendix for power analysis output.

The total sample size for the primary self-report survey exceeded initial expectations (N=813; approximately 59.3% (482) transgender). A few participants reported that they had participated in one of the previous data collections; 19 reported that they were a participant in the self-report report survey (Pilot 2) in September 2022; while 16 reported that they had participated in the pilot interview over the summer. Since this is over the amount recruited, it is possible that some of these students had made an appointment but did not follow through to interview. For gender identity, 105 (12.9%)

participants identified as cisgender, 482 (59.3%) participants identified as transgender, 99 (12.2%) genderqueer, 52 (6.4%) agender, 72 (8.9%), "none apply to me, I identify as…". Related, crosstabs with binary identity show that the largest percent of participants were transgender male, 301 (37.02%), followed by transgender non-binary 122, (15%), genderqueer non-binary, 58, (7.13%), and cisgender female 56 (6.89%) identified. Only 46 (5.66%) participants were cisgender male, 34 (4.18%) participants were transgender female, and 3 (.037%) participants were cisgender non-binary identified. Still 72 (8.86%) participants did not fall within the confines of these categories. Transgender participants were asked if they had come out to anyone (including peers and staff) at school as "transgender" prior to the short answer questions the probe about coming out experiences. Many transgender identified participants (275; 33.8%) had come out to someone at school as transgender, some (22; 2.7%) indicated that they had not come out yet, while 297 (36.5%) trans participants did not fill out this question. Of the 275 transgender identified high school students that reported that they had come out to someone at school, 16 identified as transgender female, 70 identified as transgender non-binary, 178 identified as transgender male, and 11 reported a different label.

While most participants were White, 77.1% (627), 10.8% were 2 or more races (88), 4.1% were Black or African American (33), and 4.1% were Asian (33). Compared to the pilot study, a slightly larger percent of participants (19.3% (157) were Hispanic, Latino and/or Spanish origin. While 595 (73.2%) were not Hispanic, Latino, and/or Spanish origin. Related, some students (9.7%; 79) reported that they attend a high school with predominately Latino, Hispanic and/or Spanish origin students. Like the pilot self-report sample demographics, most students reported that they attend either a

predominately white high school (41.5%; 337) or a school with a mix of ethnic compositions, 41.0% (333). Unlike the pilot sample data, the most frequent grade level among students that completed the survey was 10th grade (Sophomores) (277; 34.1%), followed by Seniors or 12th graders (238; 29.3%), then Juniors or 11th graders (230; 28.3%), and last 9th graders or Freshman (67; 8.2%). These numbers coincide with age criteria for eligibility, being that high schoolers under the age of 15 were not permitted to participate. See Tables 1.1 – 1.2 for complete data on demographics.

Primary Study Procedure

Like the pilot study, an online self-report survey design was applied to the primary study. Participants were recruited on Instagram during November 2022 using Ads that were shown for approximately two weeks. Self-report surveys were created and filled out on Qualtrics. The informed consent procedure occurred electronically by clicking on a link shown on the Instagram Ads. High-school students that indicated they are 15-17 years old were shown an assent form tailored to this age group, while high-school students that indicate they are 18 years old were shown an adult version of this form (See Appendix D).

At the completion of the online self-report survey, sample participants who indicated that their gender identity is "transgender" were asked to complete a series of short answer questions which probe about school climate needs specific to trans-identified students.

Measures – Self-Report Surveys (Primary Study and Pilot 2)

Demographics

To capture gender identity in pilot 2 self-report and the primary study, both "Gender Identity" and "Binary Identity" were used. Gender Identity (Cisgender, Transgender, Genderqueer, Agenger, "None apply to me, but I am…"). Binary Identity (Male, Female, Non-Binary, Third gender, "None apply to me, but I am…"). To allow for comparison between transgender and non-transgender high school students, participants were coded 1 if they did not identity as transgender, and 2 if they did identify as transgender.

Other individual level sociodemographic covariates were chosen based on their significance in school-based literature. Among them demographics chosen include "Grade level" (9th, 10th, 11th, 12th), "Race" (White, Black or African American, Asian, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Two or more races, Unknown), and "Ethnicity" (Hispanic or Latino or Spanish origin). In addition, "Sexual orientation" (heterosexual, homosexual, bisexual, queer-identified, asexual, questioning) was collected.

Sociodemographic covariates that characterize the school environment were chosen based on their significance in school-based literature. "Type of community high school is located in" (urban, suburban, rural), "Type of school" (public, private, charter, magnet, special education, advanced placement), and "School size" (small, medium, large). In addition, "gender composition of high school" (co-education, single sex, offers both co-education and single sex classes) was collected. "Ethnic composition of student body" (majority Hispanic, Latino, and/or Spanish origin, majority White, or Mix of Hispanic, Latino, and/or Spanish origin and White) will be collected.

Finally, sociodemographic covariates that capture geographic location were chosen based on their significance in school-based literature in the US. These variables include home residence "City" (open ended response) and "State" (open ended response), and high school location "City" (open ended response) and "State".

Gender affirmative school climate (GASC)

The proposed Gender Affirmative School Climate (GASC) scale was developed in the current study, and was informed by previous work that highlights school climate supports for transgender middle and high school students. Dimensions that facilitate a *gender affirmative school climate* were modeled after themes that emerged from an ecological-transactional review of the literature on the school climate of transgender students (Scrofani et al. *Under Review*, Ullman, 2014; Luecke, 2018). Initially, I aimed to develop items that represent five latent constructs modeled after an ecological-transactional analysis of the school ecology, each representing a contextual level in this system (Scrofani et al., *Under Review*). The five latent constructs proposed encompassed ontological, micro, meso, and macro-system levels of the school ecology. Figure 1 (p. 31) shows a diagram of the proposed latent constructs and sub-domains within each. Prior to the cognitive interview process, I developed a list of indicators for each latent construct based on sub-domains identified in Figure 1.

Throughout the scale development procedure proposed scale indicators evolved, accordingly, a new latent measurement model emerged. While the structure and content of the proposed scale resemble the hypothesized model, there are important distinctions. More specifically, based on the factor analysis procedure from pilot and primary sample

data the pattern of loadings suggest that there are four distinct sub-domains of school climate that the proposed scale is tapping into: 1) agency/phenomenology of gender (20 items; $\alpha = .945$), 2) peer bullying/victimization (8 items; $\alpha = .870$), 3) exo-and meso-system support (18 items; $\alpha = .945$), and 4) felt pressure to gender norms (5 items; $\alpha = .885$). Furthermore, factor 1's latent content encompasses three sub-domains corresponding with the proposed ecological structure, 1) individual level support, 2) micro-level support, and 3) structures and spaces support. For example, question 20 asks about individual-level perception and experience that facilitate a sense of agency: *When I'm at school I'm free to live in the gender that feels most real and comfortable*, while question 43 asks about micro-level perception and experience that facilitate gender agency: *Teachers and other staff at school support me in my gender identity*. Similarly, factor 3's latent content encompasses 3 sub-domains, including indicators that focus on support from the 1) curriculum, 2) meso-system (school-home), and 3) extra-curriculars. Although most ecological levels which correspond with the proposed ecological-transactional model emerged in the final latent structure (individual, micro, exo, and meso-system), the overall factor structure is not delineated by proximity, or by each level. Rather, items from varying degrees of proximity showed to share in common an overarching theme, the facilitation of gender agency. Related, proposed macro-system related questions were dropped after the cognitive interview phase. Content on regional and state policy was out of scope of the knowledge of high school students interviewed.

After revisions, the proposed four-factor model that makes up the GASC scale has a total of 51 questions ($\alpha = .963$). The high value for Cronbach's alpha (over .95) suggests that there is some redundancy among the scale items contributing to multicollinearity. At

the same time, the magnitude for alpha corresponding with each sub-scale (or latent domain) fell between .85-.95 (see discussion above), suggesting that there is high reliability among items for each set separately. Cronbach, Schoneman, and McKie's (1965) recommend using a stratified alpha coefficient for reliability for multidimensional scales with multiple latent domains. This approach will be considered in the future, and is beyond the purpose of this manuscript. See Table 11.1-11.2 for reliability score of each sub-sample's (transgender and non-transgender) total score and factor scores.

All 51 indicators were answered using a 7-point Likert style scale, with items scaled based on agreement (1= Strongly Disagree − 1 = Strongly Agree). A total of 13 items (25, 32, 33, 35, 36, 37, 38, 39, 40, 41, 42, 53, and 54) were reverse coded so that higher scale sum scores represent more supportive school climate. Sub-scale scores corresponding with each of the four latent domains were calculated by dividing each sum by the total number of sub-scale items. Again, high scores represent supportive or positive school climates, and lows scores signify poor school climate. See appendix for a complete list of proposed indicators on the cognitive interview script, and the final version of the scale items on the primary study script.

Measures – Exclusive to Primary Study Survey

Student Outcomes: Self-esteem and School Belonging

Outcome measures were selected as an attempt to capture important ontological and group level indicators of student well-being, including *self-esteem* and *school belonging*. School belonging was captured using the *Psychological Sense of School Membership* (PSSM) scale (Goodenow, 1993), an 18 item Likert style scale that assesses

54

school belonging in students over the age of 10. More specifically, indicators are scaled on a 5-point Likert style scale (1= not at all true, 5=completely true), and are scored by summing to attain a total score. High scores indicate higher levels of school belonging. More specifically, five negatively worded questions were reverse coded including items 85, 88, 91, 94, and 98. Questions include "*Its hard for people like me to be accepted at my school*", and "*I wish I were in a different school*". See appendix for a complete list of indicators encompassing the PSSM scale (Goodenow, 1993). Based on the primary study data the PSSM scale showed high reliability (α =.887). Furthermore, the trans sub-sample showed moderately high reliability on the PSSM (α =.892), while the non-trans sub-sample reliability score on the PSSM was slightly lower (α =.878).

Self-esteem was assessed using the Adolescent Self-Esteem Questionnaire (ASQ) (Hafekost et al., 2015). More specifically, 12 indicators are scaled on a 5-point Likert style scale, with the first half of items scaled based on frequency, (1= Almost all of the time – 5 = Hardly ever), and the second half of the items scaled based on agreement (1= Strongly Agree – 5 = Strongly Disagree). To score, 8 positively worded items are reverse coded so that higher sum scores equal higher self-esteem (Hafekost et al., 2015). Reverse coded items include 101, 103, 104, 107, 108, 109, 111, and 112. Furthermore, "…low self-esteem is equivalent to a score of 17 or below" (Hafekost et al., 2015). For example, questions based on the frequency scale include "*I feel useless*" and "*I feel I can be myself around other people*". Questions based on the agreement scale include "*I am a good person who has a lot to offer*" and "*I feel confident in my abilities to achieve the things I set my mind to*" (Hafekost et al., 2015). See appendix for a complete list of indicators encompassing the ASQ scale (Hafekost et al., 2015). Based on the primary study data the

ASQ scale showed moderately high reliability ($\alpha =.772$). Furthermore, the trans sub-sample showed moderately high reliability on the ASQ ($\alpha =.758$), while the non-trans sub-sample reliability score on the ASQ was slightly higher ($\alpha =.783$).

Internalized Transphobia – Shame sub-scale

Limited to transgender participants, the proximal mediator *internalized transphobia* was measured using the *Transgender Identity Survey (TIS)* (Bockting et al., 2020) shame sub-scale. Internalized transphobia was not included as a main hypothesis, because this individual level factor corresponds with risk, rather than protection. For future work it will be tested as a mediator in the model given previous research that shows negative internalized feelings about trans identity facilitates the relation between discrimination and well-being (Breslow et al., 2015).

Overall, the *Transgender Identity Survey* (TIS) is comprised of 26 items encompassing four sub-domains (pride, passing, alienation, shame), and is designed to capture internalized transphobia. Initially during scale development items were pooled from an open-ended questionnaire that prompted a small sample (N=12) of transgender adults to discuss their "thoughts and feelings when they felt down or ashamed of being transgender versus when they felt good or proud" (Bockting et al. 2020, p.18). Later, using data from a larger study on HIV risk and gender (N=1229) items with little covariation with other items were dropped in confirmatory factor analysis (CFA) procedure, resulting in 26 items and a four-factor structure (pride, passing, alienation, shame) (Bockting et al., 2020). Following this, Bockting et al. (2020) ran a CFA of the four-factor model (26 items) with the sample limited to transgender and transsexual

participants (N=903). Bockting et al. (2020) anticipated that the TIS would show to be more relevant and internally consistent limited to a trans identified sample because internalized transphobia is likely to be more central to their identity. Results of CFI and RMSEA suggest moderate fit of the four-factor model among a sample exclusive to transgender identified participants. Reliability of indicators of the TIS was run using pilot data (Bockting et al., 2020). Internal consistency (Cronbach's alpha) and test-rest reliabilities of three of the four sub-scales (CA of Alienation is moderate at $\alpha = .66$; N=103) suggest reliability of items are strong (Bockting et al., 2020).

Two of the four scales encompassing the TIS are applied in the present study. More specifically, the "shame" sub-scale (8 items) is used as a measure of internalized transphobia, while the "pride" sub-scale (8 items) is used as a measure for gender identity related pride. Based on agreement, the TIS uses a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7). For example, questions on the "shame" sub-scale include "*Being transgender makes me feel like a freak*" and "*I envy people who are not transgender*". See appendix for a complete list of scale items. Items are scored so that higher scores reflect more transphobic, negative attitudes (Bockting et al., 2020). Only transgender identified participants completed measures from the TIS in the current study.

Transgender Pride

Again, limited to transgender participants, the pride sub-scale of the *Transgender Identity Survey* (TIS) (Bockting et al., 2020) was used to capture (proximal moderator) *transgender pride*. More specifically, the pride sub-scale was used to assess the ontological moderator *transgender pride*. Details on the validity and reliability of the TIS

survey at large are explained above. Furthermore, the CFA procedure used to validate the TIS measure confirmed that the factors are not independent, moreover, "shame" and "pride" sub-scales are negatively related (r = -.68) (Bockting et al., 2020). Moreover, the sub-scales can be conceptualized as opposing constructs. While the "pride" construct measures feelings of self-regard corresponding with gender identity, such as sense of self-worth and respect in regard to being transgender, inversely, the shame construct captures negative feelings of self-worth in regard to trans identity.

Two of four of the TIS's subscales were used in the current study, "shame" as explained above, and "pride", reviewed in the current section. More specifically, while the "shame" sub-scale (8 items) is applied as a measure of internalized transphobia, the "pride" sub-scale (8 items) is applied as a measure for transgender pride. Based on agreement, the TIS uses a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7). For example, questions on the "pride" sub-scale include "*I am proud to be a transgender person*" and "*I am comfortable revealing to others that I am transgender*". See appendix for a complete list of scale items. In total, TIS items are scored so that higher scores reflect more transphobic, negative attitudes (Bockting et al., 2020). In this way, items on the "pride" and "passing" sub-scales are reverse coded. No reverse coding was needed for the current study since higher scores denote more pride. Only transgender identified participants completed measures from the TIS in the current study, including pride and shame sub-scales. Based on the primary study data (trans sub-sample) the *TIS pride* scale showed high reliability (α =.863).

Youth Activism

At the group level**,** *involvement in activism* was measured using the Youth

Inventory of Involvement (YII) scale (Pancer et al., 1997; Pancer, Pratt & Hunsberger,

2000; 2007). The YII has 30 items designed to capture the frequency of youth's

involvement in community, school, and political activism, as well as more proximal

helping activities (Lyons 2005; Leviss, 2020). The measure is not based on a theoretical

framework, rather was created by Pancer et al. (2007) for the purpose of their study

(Pontes, Henn, & Griffiths, 2016). More specifically, Pancer, Pratt, and Hunsberger

(2000) used factor analysis to establish four sub-scales including political activities,

community/neighborhood activities, helping activities, and responding activities. All

scales encompassing YII are applied in the present study. Using a 5-point Likert scale,

participants rate how often they participated in each activity in the past year. Based on

frequency, the YII uses a 5-point Likert scale including 0 = you never did this, 1 = you

did this once or twice, 2 = you did this a few times, 3 = you did this a fair bit, 4 = you did

this a lot (Pancer et al., 1997; Lyons, 2005). For example, questions include

"*Participated in a school academic club or team*" and "*Volunteered at a school event or

function*." See appendix for a complete list of scale items. Total scores range from 0 –

140, ranging from uninvolved to highly involved (Lyons 2005).

Internal consistency of items is high. More specifically, in a longitudinal study

based on a Canadian adolescent sample Pancer et al. (2007) obtained a Cronbach's alpha

(based on total scale score) at each time point that suggests high reliability ($\alpha = .90$ at

Time 1; $\alpha = .88$ at Time 2). This is similar to CA scores based on the total score of the

YII for the National Conference for Community and Justice (NCCJ) in their research on

the application of their diversity awareness program ($\alpha = .92$; N = 253) (Lyon, 2005)

among a sample of adolescent high school students. Like previous research, the YII scale showed high reliability (α =.946) among the current primary study's high school student sample. Among the trans sub-sample the YII showed high reliability (α =.927), while the non-trans sub-sample reliability for the YII is slightly higher (α =.958).

Furthermore, Pancer et al. (2007) assessed the validity of the YII by correlating its total score with the Youth Social Responsibility Scale (YSRS). The YSRS assesses youth's feelings of social responsibility, unlike the YII that assesses the frequency of involvement in activism (Lyons, 2005). Correlations between the YSRS and YII at both time 1 (.33; N=871, p < .01) and time 2 (.23; N = 326, p < .01) were low, so validity was deemed satisfactory (Pancer et al., 2007; Pontes, Henn, & Griffiths, 2016).

Similarity to Peer Group Gender

Next, *similarity to peer group gender* was measured using the Gender Similarity scale (Martin et al. 2017). Students were asked the extent to which they feel similar to boy, girl and non-binary peer gender groups. While binary categories applied are based on the original measure (Martin et al., 2017), the addition of the non-binary category was adapted to accommodate students with non-binary identities in the current study. For example, one of the questions reads "*How similar do you feel to peers who identify as Girls*?", and the added question reads "*How similar do you feel to peers who identify as non-binary*?" Items were scaled using 5 points, on a scale of 0-4. Participants were asked to report the extent to which they feel similar to peer groups based on their binary (gender) identity (0 =not similar at all, 1 = a little similar, 2 = somewhat similar, 3 =

moderately similar, 4 = extremely similar). All participants completed this measure. A complete list of questions are listed in Appendix D.

Transgender Short Answer Questions

See Appendix D for a complete list of questions asked in the qualitative short answer portion of the self-report survey, only shown to transgender identified students. Short answer questions were included as a device to ask more in depth about school supports and challenges specific to high school transgender students. As such, a portion of these questions were designed to ask about the "coming out" experience at school. So, transgender identified participants were first asked if they had come out to any one at school, including staff and peers. For example, one question asks: *Did at least one school professional take the lead to communicate with your family to create a partnership advocating support for your gender identity?*

Data Analysis

After the cognitive interview procedure (pilot 1), two separate samples were drawn (pilot 2 and primary study) to facilitate the scale development process (Germain, 2006, p.896; Syvertsen, Wray-Lake, & Metzger, 2015). First, data analyses were internal focused, aiming to test parsimony and fit of the measurement model of the proposed school climate scale indicators. Based on the pilot self-report data, the first step was an exploratory factor analysis (EFA) procedure to estimate the number of latent domains, and content therein. Furthermore, this procedure tested if the hypothesized factor structure (based on the ecological-transactional model) showed to be the most

61

parsimonious. Throughout the series of EFAs the model rotation and amount of latent domains were refined. Finally, a confirmatory factor analysis (CFA) was run to confirm the latent structure with the pilot data. Accordingly, descriptive analyses on items (M, SD, mode) and each sub-scale were conducted.

Next, to examine if the latent structure and relationships among indicators resembled the measurement model drawn from the pilot 2 sample, the scale development procedure continued by applying CFA to the primary sample. Descriptive analyses on items (M, SD, mode) and each sub-scale were conducted. The CFA procedure confirmed the proposed scale's structure with the primary data sample.

Measurement Invariance using a multiple-group CFA approach was carried out to examine if the proposed school climate instrument is invariant across transgender and non-transgender high school students. First in this procedure, baseline latent measurement models each for transgender and non-gender groups were developed using CFA, and re-specification of these models to reach the most parsimonious solution. Measurement and structural invariance across "gender identity" status were explored with invariance testing.

Based on primary study data, composite reliability (internal consistency) for each factor, and the GASC scale composite were assessed using Cronbach's alpha. Then, correlation analyses were conducted to assess direct relationships between sub-scales, proposed moderators, and outcome variables. Correlation tables were divided by transgender and non-transgender groups, to illustrate differences in these relationships by group.

Second, data analyses transitioned to be more external focused, aiming to test the structural model for the proposed GASC scale with student wellness outcomes (school belonging and self-esteem). Related to this goal, I aimed to test chosen moderators hypothesized to interact in this relationship, between school climate and school belonging, and school climate and self-esteem. First, all hypothesized main effects and interactions in the relation between gender affirmative school climate and self-esteem, and gender affirmative school climate and school belonging were assessed using Ordinary Least Squares (OLS) regression analysis, controlling for grade level. Then, latent modeling applying structural equation modeling (SEM) was used to estimate the relationship between the proposed gender affirmative school climate scale and student wellness outcomes (self-esteem and school belonging), and to estimate protective factors that may indirectly contribute to this relationship.

More specifically, I tested three moderators (trans pride, activism, and similarity to peer group gender) in these relationships. First, the moderation models tested the contribution of individual level supports (transgender-identity pride) to strengthen the relation between more distal support in school ecology (the current school climate measure) and student wellness outcomes. Second, the moderation models tested the impact of group level supports (activism; similarity to peer group gender) in contributing to the strength of the relation between gender affirmative school climate and student wellness outcomes. Furthermore, I aimed to examine if individual and group level factor act as protective factors by strengthening the relationship between school climate and student wellness outcomes, including self-esteem and school belonging. For the sake of time, the findings from only one latent interaction model, (transgender pride as a

63

moderator in the relation between school climate and school belonging), is included in this manuscript.

Supplemental Analyses: Atemporal Mediation Model

Going forward, supplemental analyses will test three mediators contribution in the relation between gender affirmative school climate and student wellness outcomes. The mediation model is proposed to measure the process by which individual and group level supports are informed by school climate, and in turn influence student outcomes, including self-esteem, and school belonging. More concretely, to measure the process by which individual and group level supports account for the relation between school climate and student outcomes.

First, a mediation model will be tested that measures the process by which individual level school supports (transgender-identity pride) mediate the relation between more distal support in school ecology (the current school climate measure) and student outcomes. Using this mediation approach ontological variables such as individual perception are subsequent to external factors in the school ecology that encompass school climate, and lead to school and wellness outcomes. Although mediation models that follow a clinical model of stress have been used in transgender health research (Breslow et al., 2015), by anticipating proximal systems to mediate the relationship between more distal factors and mental health outcomes, rarely has this been modeled in the school ecology to measure trans student outcomes (McGuire et al., 2010; Hatchel & Marx, 2018).

Second, expanding on the clinical model of stress which follows that individual

level indicators mediate the relation between gender-minority-stress and wellness

outcomes, at the group level, involvement in activism and similarity to peer gender

groups will be included in the model as mediators in the relation between school climate

and student outcomes (self-esteem; school belonging). Similar to this model, Breslow's et

al. (2015) research (albeit not school-based) demonstrates a need for more literature

based in schools that simultaneously examines ontological and group level factors, like

transgender pride and involvement in activism, in contributing to the relationship

between supports encompassing school climate and trans student outcomes.

Inference and Use Argument (IUA) for Validity

In practice, a mixed methods approach to scale development was applied to

validate assumptions about the content of the scale indicators. These assumptions are

grounded by an argument-based approach to validity, chosen to generate an "empirically

grounded construct *interpretation*" (Messick, 1995) of the proposed GASC scale. Since

the GASC scale proposes a new lens to capture school climate, an argument-based

approach to validity helps to provide evidence that the item content is capturing

characteristics of the phenomena which coincide with a proposed conceptual definition

(DeVellis, 2017). Overall, Kane's (2013) argument-based approach to validity takes into

account how reasonable the researchers' argument is in claiming that scores are

encompassing what they set out to.

In the current study, an interpretation and/or use argument (IUA), a formal set of

claims that outlines the reasoning integral to the proposed or hypothesized use of scores

(Kane, 2013), has been developed to explain the key assumptions underlying the proposed use (Weinfurt et al., 2022) of a Gender Affirmative School Climate (GASC) scale. In addition, the IUA is backed up by evidence for and against assumptions underlying the proposed use of the GASC scale. As a result, validation of the GASC is gauged by the extent to which there is evidence that claims are reasonable. In other words, validity depends on how well evidence supports these claims.

Overall, the proposed interpretation and use of the GASC scale is to act as a tool to capture high school student perceptions of school efforts to facilitate trans and non-trans student support, such as creating gender visibility and inclusion (Luecke, 2018), promoting a culture of gender equity, and educating about gender across subject domains, including topics in the curriculum that teach about traditional stereotypes, and gender diversity. Furthermore, scores are intended to be used to identify gender affirmative strategies which bolster school climate for transgender and other gender diverse students (Luecke, 2018; Ullman, 2018; Goodrich & Barnard, 2018; Coulter et al., 2016; Toomey, McGuire, & Russell, 2012). Currently, there is limited school-based research driven by the gender affirmative model to identify and measure protection within a school ecology (Luecke, 2011; Luecke, 2018; Ullman, 2018; Malpas, Glaeser, & Giaammatei, 2018). Overall, the GASC can be used to reveal ways schools can be pro-active, and to encourage them to shift focus to acknowledge their own role in creating a safe space that is equitable, inclusive, and diverse (Ullman, 2018; Luecke, 2018; Goodrich & Barnard, 2018). There have been school climate measures created to help capture what supports LGBT students (Coulter et al., 2015), but the representation of gender in school spaces has not been isolated from sexuality among school climate scales.

Assumption 1-4 of the IUA for this study are related to content validity as described in the common three-type model (DeVellis, 2017). So, content related evidence is discussed to rationalize that generated indicators denote an appropriate estimate of gender affirmative school climate, as defined by theories that inform the scale (Kane, 2013). Assumption 5 attends to evidence that scale scoring is equivalent across groups. See Appendix B for a complete list of assumptions with corresponding evidence argument discussion.

CHAPTER 3

RESULTS

Missing Data - Pilot 2 Sample

The same procedure to assess systematic missingness was carried out on pilot and primary study self-report data. For the sake of time, this procedure is reviewed in full only for the primary study data (See Appendix C). A general overview of missingness patterns for the pilot 2 data is reviewed first here.

Little's MCAR Test - Pilot 2 Sample

Little's MCAR test (Little, 1998) was ran with the MVAs to test the null hypothesis that the data is missing completely at random (MCAR). Results of Little's MCAR tests suggest that the data is missing completely at random (MCAR), ($\chi 2$ (df = 2066, N = 813) = 2060.957, p = 527).

Missing Data Patterns and Frequencies

For the pilot sample, MVA results show that the three most common missing data patterns at the item level are demarcated by transition points on the online self-report instrument. In the order of most common drop-off patterns (the first being no missing data) Item 26 (and beyond), 43, and 65 are all the first question to appear after the user clicks an arrow to toggle to the next screen. For example, approx. 81 participants dropped off at question 26, and approximately 80 more dropped off at question 43 on the school climate measure. These results suggest that the three most common missing data patterns are not random, and in part are related to this methodological bias.

Systematic Missingness

Auxiliary analyses ran suggested that drop-off at question 26 and 43 was not random, and is biased beyond the design of the survey instrument. First, missingness on item transition points were each regressed on demographic variables, including gender identity, binary gender, sexual orientation, grade, and race. This process was followed by a running a crosstab analysis between each demographic variable and missingness on each drop-off variable to further examine frequencies by group and to interpret the chi-square statistic of relationship.

Sexual orientation was the only demographic significantly related to missingness on question 43 in both the chi-square (χ2 (df = 6 , N = 758) = 12.82, p = .046) and logistic regression ran. Homosexual (N=134; missing =8) and Heterosexual (N=80; missing =6) had the lowest rate of missingness at item 43, followed by drop off. While asexual (15%) and bisexual (14.2%) identities have similar amounts of missing to non-

missing on item 43. Thus, it does not seem that drop-off at question 43 is influenced by LGBT status.

Earlier in the survey at question 26, gender identity related to missingness in both the chi-square ($\chi 2$ (df = 4 , N = 758) = 19.06, p = .001) and logistic regression ran. Genderqueer (N=139; missing =8) and "None apply to me" (N=49; missing =3) had the lowest rate of missingness at item 43, followed by drop off. Cisgender (21.4%) identity has the largest rate of missingness at 43, followed by drop-off. Whereas transgender (10.2%) and agender (7.6%) identities have similar amounts of missingness on item 43. For the pilot sample cisgender status influences the likelihood of drop-off at item 26, however these result were not replicated based off the primary study sample.

Conclusions

Based on the results of missing data analyses reviewed multiple imputation was chosen to handle missingness on items. First the SPSS version 12 compatible random number generator was used to set the starting sequence value (2000000) to reproduce a sequence of random numbers for the imputations. This is a regression approach which generates multiple iterations to find suitable data. Based on the monotone pattern of missingness, monotone was selected as the imputation method, and 20 imputations was used to find a robust solution. All items on the proposed school climate scale were used as predictors and imputed in the model.

Missing Data - Primary Study

See Appendix C for a complete review of the procedure.

Based on the results of missing data analyses reviewed multiple imputation was chosen to handle missingness on items. First the SPSS version 12 compatible random number generator was used to set the starting sequence value (2000000) to reproduce a sequence of random numbers for the imputations. This is a regression approach which generates multiple iterations to find suitable data. Based on the monotone pattern of missingness, monotone was selected as the imputation method, and 20 imputations was used to find a robust solution. All items on the proposed school climate scale, and scales corresponding with outcome and moderators, were used and imputed in the model.

Pilot Study – Scale Development

After candidate items were established in the cognitive interview phase of the pilot study, these indicators were applied to encompass questions on the pilot 2 self-report study. Similar to the item generation and cognitive interview stages, pilot 2 data collection is internal focused. Moreover, data analysis at this stage was focused on testing how items behave and relate to each other. Accordingly, results establish the amount and quality of latent domains, given the hypothesized model. Mplus version 8.8 was used to estimate the proposed measurement model. In Mplus version 8.8 an Exploratory Structural Equation Modeling (ESEM) approach was applied to accommodate the multiple imputed data set. These models essentially can be interpreted as exploratory factor analyses (EFA). Weighted Least Squares (WLSMV) estimation was applied to all ESEM models to accommodate the ordered categorical scaling of the proposed school climate scale.

However, ML estimation was used in the first preliminary model to generate a scree plot (See Figure 3.0). Quartimax rotation was selected for the first preliminary analysis ran since its commonly applied to maximize the variance of factor loadings for indicators in the social sciences. Based on Quartimax rotation, scree plot suggests to retain 3-4 factors to reach a parsimonious solution. We can estimate the number of factors to include in the model for the proposed scale by counting the points that fall before the elbow of line.

Given that the factor correlations (Table 4.0) from both the 3 and 4 factor models estimated were moderate, oblique rotation, which allows factors to correlate, was chosen for all subsequent models ran. Overall, results of the three-factor model using Quartimax rotation, and four-factor model Varimax rotation were similar. At the same time there are important distinctions between these rotations that influenced the number of latent domains, and content within.

First, comparing the factor loading matrices of the three (Quartimax) and four factor models (Varimax) (Table 5.0) the pattern of loadings suggested that there are either three or four distinct sub-domains of school climate that the proposed GASC indicators are tapping into. For Varimax, the four-factor model's (ESEM; WLSMV estimation) pattern of loadings suggested that there are four distinct sub-domains of school climate that the GASC is tapping into: 1) Peer bullying/victimization, 2) Agency/phenomenology of gender, 3) Exo-system support, and 4) Felt pressure to conform to gender norms. For Quartimax, the three-factor model's (ESEM; WLSMV estimation) pattern of loadings suggested that there are three distinct sub-domains of school climate that the GASC is tapping into: 1) Agency/phenomenology of gender, 2) Peer bullying/victimization, and 4)

Felt pressure to gender norms. While the goal of Quartimax rotation is to maximize the variance of the factor loadings, one strong general factor is a potential limitation. Based on the Quartimax rotation (ESEM) results, indicators loading on factor 1 and factor 3 were consolidated onto factor. While items with content focus on exo-system (curriculum 52, 61, 63, 65, 66, 67, 68, 69, 70, 71, 75 extra-curricular 72, 73, 82) and meso-system (school-home 56, 57, 58, 60) hung together on factor 3 using the Varimax (ESEM) approach. CF-Varimax is recommend if factor loadings are showing to favor the first factor, rather than spread among the proposed number of factors (ie loadings are higher for indicators on factor one).

Second, OLS unique variances and communalities of indicators for the three (Quartimax ESEM) and four factor model (CF-Varimax ESEM) analyses ran show that proportion of variance accounted for is similar. Items 73 (*My school has a social support group/s designed to create an alliance between cisgender and students in the great LGBTQIA+ community, such as a Gay Straight Alliance (GSA).* (Moved from factor 1 in the pilot study) and 29 (*I have friends at school who I freely talk to about topics that expand the traditional concept of gender, such as gender diversity (for example advocating for non-binary and trans identities) and gender equity (for example, challenging gender roles in the math and sciences or speaking up for school gun violence*) showed high unique variance from each rotation approach. While item 29 was dropped, item 73 has been retained due to the empirical significance of GSA's influence on school climate among LGBT students shown in the literature (SScrofani, *Under Review*; specific refs add here). Due to the addition of the latent domain "exo and meso-system support" using CF-Varimax rotation, the proportion of variance (communality) of

item 65 and 66 accounted for by the new factor in the model increased, and unique variance went down.

Third, OLS matrix of residuals for both the Quartimax and CF-Varimax solution show that the majority of residual covariances were low, below .100. Residual for covariances values showed that model parameters adequately estimate the relationships between most indicators using each rotation approach. Item 65 and 66 is one major area of strain identified across three and four factor models. The high positive estimate (1.554; CF-Varimax) suggested that there is redundancy in content between these two items.

Based on a comparison of results between three (Quartimax) and four factor models (Varimax) looking at 1) factor loading matrices, 2) OLS unique variances and communalities, and 3) OLS residual matrices, the four-factor model was chosen based on overall measurement quality and fit (Quartimax: $\chi2 = 4707.059$; RMSEA=.048; CFI =.860; SRMR=.037; CF-Varimax; $\chi2 = 6754.735$; RMSEA=.062; CFI =.907; SRMR=.039; See Table 3.0).

Following Samuels (2017) guide to dropping indicators during the EFA procedure, I ran a series of ESEMs (CF-Varimax; Oblique) to help eliminate questions that showed poor measurement quality, likewise were contributing to overall misfit of the model. First in this process, 1) I removed 6 items with very low communalities .3 and below (items 30, 34, 47, 51, 55, 74). After re-assessing model results without the 6 items, 2) I removed items with low factor loadings (items 27 and 28), and re-run the model. Third, 3) the pattern of loadings were assessed again, taking into consideration theory, factor loadings, and communalities I dropped items 31 and 44. Finally, after re-assessing

model results with 10 items dropped, item 48 was dropped in the final model that was ran (See Table 3.0 for model fit information).

A Confirmatory Factor Analysis (CFA) was run on the total sample (N=758) following the ESEM procedure, applying the factor structure identified from the EFA-ESEMs ran ($\chi2$ = 8487.586; RMSEA=.085; CFI =.860; SRMR=.074; See Table 3.0). Question 28 was retained for its theoretical significance in this model. Model fit without Q28 was slightly better ($\chi2$ = 8367.195; RMSEA=.086; CFI =.859; SRMR=.075) for most fit statistics. Question 28 was retained as an indicator for the second self-report sample, the primary study.

Primary Study – Scale Development

For the next phase of scale development candidate scale items retained from pilot 2 made up the proposed GASC scale included in the self-report instrument. At this stage, the purpose of data analysis was still internal focused, however now Confirmatory Factor Analysis (CFA) was applied to confirm the model established in the pilot phase. Unlike the ESEM approach, constraints were applied to the factor matrix to delineate latent domains, or which indicators loads on each factor. Four latent domains were identified in the model, Gender agency (20 indicators), Peer bullying and victimization (8 indicators), Exo- and Meso-system support (18 indicators), and Felt-pressure to peer group gender (5 indicators). See Table 6.0 and Figure 4.0 to see a complete list of indicators organized by their latent domains.

A series of five CFAs were run, with each consecutive model correcting for identified areas of measurement strain in the previous model. Initially, measurement

quality in model 1 was adequate to good based on factor loading thresholds and significance (majority over .500), moderate (significant) correlations in relationship between all latent domains, and high reliability estimates among sub-scales (Figure 4.0 and Table 6.0 shows estimates for Model 6). In addition, most items showed moderate to high item communalities (over .400) which demonstrated that variance is accounted for by the model, and covariance is due to shared common factors. However, items 29 and 76 had the lowest communalities (below .200) relative too other indicators (Model 1 – 2), with high residual or left over variance not accounted for by the model. As a result, item 29 was dropped in Model 2, and item 76 was dropped in Model 3. Model fit showed slight improvement after eliminating these items (See Table 7.0).

Following this, a fourth and fifth model were run, first moving item 56 to from factor 1 (gender agency) to factor 3 (exo and meso supports), then moving item 73 from factor 1 to factor 3. These changes were made primarily on theoretical grounds, content focus is more related to support derived from exo and meso-system contextual levels (73 with exo support; and 56 with meso-system support). Model fit for Model 5 (with item 56 and 73 re-specified) showed slight improvement compared to the previous model ran ($\chi2$ = 7638.875; RMSEA=.082; CFI =.866; SRMR=.064), see Table 7.0.

Finally, in Model 6 overall measurement quality and model fit results suggest that the re-specified model relating the four latent domains to measures is consistent with the observed data ($\chi2$ = 7433.841; RMSEA=.081; CFI =.872; SRMR=.062), see Table 7.0, and Figure 4.0. In model 6, residual covariances were added between indicators that showed the highest amount of strain (See Figure 4.0). Chosen residuals covariances were based on relationships among items that showed the highest magnitude of strain common

75

to both the transgender and non-transgender baseline models. Further re-specification may be needed, only allowing residual variances to be partitioned among indicators that load on the same factor.

Measurement Invariance – Multi-Group CFA

Procedure

A series of multi-group confirmatory factor analyses (CFAs) were performed to determine if the items that make up the GASC instrument operate equivalently across gender identity. Prior to this process, gender identity was recoded into two categories, non-transgender and transgender, because transgender students are the focus of this manuscript. More specifically, to test for invariance across gender identity, three sets of parameters were tested in sequence. In order from first to last parameters tested in this process include factor loadings, factor variance and covariances, and latent means. Preliminary analyses to estimate baseline models for each group were ran first, followed by conducting a series of tests for equivalence across groups on chosen parameters.

Baseline Model Results

A baseline CFA model each for non-transgender and transgender high school participants was ran to establish each model's optimal fit. These baseline models are the hypothesized multi-group model. Overall, results from each preliminary CFA corresponding with each group shows that baseline models are not identical across transgender and non-transgender participants. For the non-transgender group, CFA results goodness of fit statistics suggest that the initial model has poor fit ($\chi^2 = 3864.78$; CFI = .895 ; RMSEA = .090 ; SRMR = .090), while the transgender group results are

approaching optimal (χ^2 = 3771.090; CFI = .891 ; RMSEA = .075; SRMR = .061). See

Figures 5.0 and 6.0 for latent path model including factor loading and residual error

estimates.

Baseline – Non-Transgender group

After reviewing residual covariances statistics for non-transgender participants

parameters were identified that were contributing to model misfit. Many indicators

showed high residual covariance with item 32, and with item 42 on the GASC

instrument. Item 32 states "*Among peers at school I have witnessed comments or*

behaviors that convey insensitivity, or invalidate the thoughts, feelings, or reality of

marginalized gender identities (including cisgender and gender diverse)." Item 42 states

"*A peer has threatened to physically hurt me because of my gender identity or*

expression." I checked for potential overlapping content, or redundancy that may account

for shared measurement error between items. For negative values, I checked if items have

content with opposing themes. For example, Q32 and Q33 have a residual covariance

value of .371. Item content check shows that these are the same question but one asks

about personal experience, other asks about experience of others. Related, Q32 and Q58

have a high residual covariance value of .363. Item content check suggests that sensitivity

on gender equity, that may relate to sensitivity about gender-related microaggressions. A

third example, Q42 and Q75 have a high residual covariance value of -.361. So, the items

correlate less than the model expected. Item content check shows themes seems to be

opposing each other, one touching on physical threats from peers because of gender

identity, the other asks about gender diverse role models invited to speak.

As a result, a post hoc baseline model (Baseline 2) respecifying these relationships to include residual covariances was ran. Estimation of the respecified model for the non-transgender group yielded improved model fit statistics (χ^2 = 3532.92; CFI = .908 ; RMSEA = .085; SRMR = .084).

A second post-hoc model (Baseline 3) was run to respecify relationships between indicators to include cross-loadings on items. Items 46, 60, 61, 62, and 64 showed high covariance with indicators loading on a separate factor than their assigned latent domain. A correlation that meets or exceeds a threshold of .750 was used to assign cross-loadings for these items. A second pass on correlation statistics using a threshold of .700 was used to identify mismatch in patterns at large. Estimation of the respecified model for the non-transgender group did not improve model fit statistics (χ^2 = 3517.679; CFI = .908 ; RMSEA = .085; SRMR = .084;), rather chi-square increased from the previous model ran. Based on Liu and Sriutaisuk (2021) review comparing FIML and multiple imputation approaches to measurement invariance with ordinal variables a pooled chi-square difference score can be computed compiling difference estimate from each imputation of data (20 total). Since this process would take a substantial amount of time it could not be performed for the purpose of this manuscript.

As a result, a third post hoc baseline model (Baseline 4) respecifying relationships to include residual covariances was ran (note, after this model recommend to respecify one parameter at a time, that is 1 cross loading or 1 residual covariance at a time). A lower threshold than the first pass (above +/- .300) for the first post-hoc model was used to identify patterns between indicators that are out of range, including residuals around .250 (+/-), or between the range of .170 and .300. After reviewing residual covariances

statistics for non-transgender participants parameters were identified that are contributing

to model misfit. Five indicators showed high residual covariance with item 24, "*At my*

school students of all gender identities feel listened to, represented, and that they have a

voice". Residual covariances for item 24 with these five indicators (items 32, 33, 37, 39,

and 42) were added to the baseline 4 model for non-transgender participants. Related to

the previous baseline model, residual covariances at a lower threshold on items 32 (with

items 60, 63, 64, 68, 69, 70, 71, and 80) and 42 (with items 57, 61, 68, 72, 78, 80, and 82)

were added to model 4. Estimation of the respecified model for the non-transgender

group yielded improved model fit statistics (χ^2 = 3236.417; CFI = .919 ; RMSEA = .080;

SRMR = .077), and chi-square decreased from the previous model ran.

Although the third post-hoc baseline model shows improved model fit, a fourth

post-hoc model (Baseline 5) was ran adding more residual covariances that are out of

range. Similar to the threshold used in the previous model, residuals covariances between

items around .250 (+/-), or between the range of .170 and .300 was used as a cut-off.

Question 33, *Peers at school have commented or behaved in ways that convey*

insensitivity, or invalidate my thoughts, feelings, or reality because of my gender identity

(cisgender female, transgender, non-binary identified, etc.) contains the identical content

to item 32, however asks participants to draw on personal experiences. Similar to item

32, item 33 shows the highest amount of residual covariances with other indicators on the

scale, 18 total falling within the threshold used here. Residual covariances for item 33

with these eighteen indicators (items 46, 50, 52, 56, 58, 60, 61, 63, 64, 65, 67, 68, 69, 70,

71, 72, 75, 80) were added to the baseline 5 model for non-transgender participants to

help improve model fit. Estimation of the respecified model for the non-transgender

group yielded improved model fit statistics (χ^2 = 3098.901; CFI = .923 ; RMSEA = .078; SRMR = .073), and chi-square decreased from the previous model ran.

Finally, a fifth post-hoc model (Baseline 6) was ran including remaining residuals covariances that are out of range. Four indicators (item 32, 33, 37, 42) show high residual covariance with Question 26, *At my school students of different gender identities (i.e. including cisgender, transgender, non-binary identified, etc.) blend, interrelate, and feel like valid members of the community.* Four of these items also had an out of range residual covariance with item 24, and were added to the model in the third post-hoc test (Baseline 4). Residual covariances for item 26 with these four indicators (items 32, 33, 37, and 42) were added to the baseline 6 model for non-transgender participants. Estimation of the respecified model for the non-transgender group yielded improved model fit statistics (χ^2 = 3059.873; CFI = .925 ; RMSEA = .078; SRMR = .072), and chi-square decreased from the previous model ran. This baseline model was applied to be used in the configural model, the first and least restrictive model in the group invariance procedure.

Baseline – Transgender group

Since results from the baseline model for transgender participants are approaching optimal (adequate), only one post-hoc test (Baseline 2) was run identifying residual covariances with the highest strain. Similar to the non-transgender group model, high residuals covariances on items 32 and 33 were shown. Distinct from the non-transgender group model, item 32 showed a high residual covariance with items 38, 41, 42, and 73, and item 33 showed a high residual covariance with items 41 and 42. These relationships

were added to the model. Estimation of the respecified model for the non-transgender group yielded improved model fit statistics (χ^2 = 3665.103; CFI = .895 ; RMSEA = .073; SRMR = .059), chi-square decreased from the previous model ran. This baseline model was applied to be used in the configural model.

Beyond this, there are five high residual covariances (above approx. 150) among relationships between items for both transgender and non-transgender identified participants. As a result, residuals covariances were added to the general model on indicator 42 (with items 57, 60, 61, and 75) and 32 (with item 60) in the configural model.

Configural Model

Once the baseline model for each gender group (transgender identified and non-transgender identified) was established, I began the procedure to test the hypothesis for equivalence of the GASC across transgender and non-transgender high school students. Baseline models were applied to be used in the configural model. This is the least restrictive model in the group invariance sequence, without cross-group equality constraints. The same parameters that were estimated separately in each baseline model, are estimated again in the multi-group model. The baseline procedure showed that the hypothesized factor structure across transgender and non-transgender participants is not identical, rather there were many high residuals covariances on 5 indicators for non-transgender participants. As a result we know a priori that the following test for invariance can be denoted as partial measurement invariance. The residual covariances that differ across groups will not be tested.

The extent to which a confirmatory factor (CFA) model measuring Gender Affirmative School Climate (with 51 indicators on a 7 point Likert-type response scale) shows measurement and structural invariance between transgender and non-transgender identified high school students was examined using Mplus version 8.8 (Muthen & Muthen, 1998-2023). Weighted Least Squares (WLSMV) estimation was used for all analyses to treat the Likert-type response scale as ordered categorical. Nested model comparisons using chi-square difference test could not be performed using multiple imputation, so model fit was assessed by improvement of fit statistics. The non-transgender group was the reference group in all invariance models. The configural model was specified so that the four-factor model was specified simultaneously for each group. For identification within each group, the factor means were fixed to 0 and the factor variances were fixed to 1. Factor loadings and residuals variances were freely estimated in each group.

Model fit results from the configural model including the combined baseline models for transgender and non-transgender identified participants showed good model fit ($\chi^2 = 6871.069$; CFI = .913; RMSEA = .066; SRMR = .065). See Table 9.0. Model fit results suggest that the item-factor structure is similar across groups. The same items load on each factor for transgender and non-transgender groups. Without any equality constraints we can conclude that the configural invariance-factor structure is the same across groups. In the following procedure a series of equality constraints were applied in each subsequent model to test measurement and structural invariance.

Invariance Test – Measurement Model 1

First in this sequence, measurement model parameters were targeted by specifying cross-group equality constraints for factor loadings. In this way, factor loadings were constrained to be equal across groups. Like the configural model, residual variances were freely estimated in each group. Factor variance was fixed to 1 for the reference group, however now was freely estimated for the transgender group. Factor means were fixed to 0, like in the configural model. Model fit results from the metric model showed good model fit, with slightly improved level of values on RMSEA and CFI compared to the configural model (χ^2 = 6859.694; CFI = .914; RMSEA = .065; SRMR = .066). See Table 9.0.

Factor loadings and R2 values for indicators were examined to see if there are points of localized strain among the constrained loadings. Among the non-transgender group items 32 and 33 (each question interrogating gender-related micro-aggressions) showed lower R2 and factor loading relative to other questions. This pattern was not observed among the transgender group. At this stage in the procedure metric model fit results meet the criteria for "weak factorial invariance" (Grimm et al., 2017), and suggest that all items are related to the latent factors equivalently across groups. Since area of strain was identified on items 32 and 33, in the next model testing for "strong measurement invariance" (Grimm et al., 2017) most loadings were held invariant across groups, with exception to item 32 and 33.

Once it was known which factor loadings were group-invariant, these parameters were constrained equal, while item thresholds are tested next in this sequence.

Invariance Test – Measurement Model 2

Second in this sequence, measurement model parameters were targeted by specifying cross-group equality constraints for item thresholds. Measurement invariance procedures with categorical indicators require that factor loadings and item thresholds show group invariance to meet criteria for "strong measurement invariance" (Grimm et al., 2017). In Mplus v. 8.8 item thresholds were constrained to be equal across groups. Like the previous models ran, residual variances were freely estimated in each group. Similar to the test for factor loading equivalence, factor variance was fixed to 1 for the reference group, and was freely estimated for the transgender group. Factor mean was fixed to 0 for the reference group, however now was freely estimated for the transgender group. Model fit results from showed good model fit, however was not as optimal as the previous model ran ($\chi^2 = 7583.263$; CFI = .899; RMSEA = .070; SRMR = .065). See Table 9.0. Thus, the measurement model does not meet the criteria for "strong invariance".

Invariance Test – Structural Model 3

Preceding models demonstrate "weak factorial invariance" (Grimm et al., 2017) of the measurement model. Partial measurement invariance was shown a priori in the baseline CFA procedure in which residual covariances were identified for each group accordingly. Structural invariance is tested in the next two models.

First, structural model parameters were targeted by specifying cross-group equality constraints for factor variances. Once it was known which measurement parameters were group-invariant, these parameters were constrained equal, while structural parameters are tested next in this sequence. Based on the previous results, these

parameters encompass criteria for "weak factorial invariance" (Grimm et al., 2017). In Mplus v. 8.8 factor variance was constrained to be equal across groups. Based on results of the model testing for factor loading equivalence (measurement model 1), most loadings were held invariant across groups, with exception to item 32 and 33. Like in measurement model 1 and 2, residual variances were freely estimated in each group. Unlike the test for factor loading (measurement model 1) and threshold (measurement model 2) equivalence, factor variance was constrained equal by fixing both the reference model and transgender model to 1. Like measurement model 2, factors means were fixed to 0 for the reference group, and were freely estimated for the transgender group. Model fit results from showed good model fit, however was not as optimal compared to measurement model 1 (χ^2 = 7275.269; CFI = .905; RMSEA = .068; SRMR = .066). See Table 9.0.

Invariance Test – Structural Model 4

Second, structural model parameters were targeted by specifying cross-group equality constraints for latent means. In Mplus v. 8.8 factor means were constrained to be equal across groups. Like structural model 3, factor variance was held equal across groups. Model fit results from the structural model 4 showed good model fit, with improved level of values on RMSEA and CFI compared to all (configural, measurement, and structural) models ran (χ^2 = 6796.192; CFI = .915; RMSEA = .064; SRMR = .066). See Table 9.0. Improved model fit results suggest that there is some structural equivalence across groups, however we conclude that the proposed scale only meets the criteria for "weak factorial invariance".

Preliminary (OLS) Regression Analyses

Prior to the latent structural equation modeling approach (SEM), each hypothesis was examined by running ordinary least square (OLS) regression in SPSS. In each of the main effect and interaction hierarchal regressions run grade level was held constant. Moderators included in models were centered at their mean.

There are important mean differences among key measures by gender identity (transgender or non-transgender) that stood out. Overall non-transgender identified students (M = 193.96, SD = 58.31) reported higher gender affirmative school climate compared to transgender identified students (M = 179.44, SD = 56.00), t (17008) = 16.33, p < .01. Related, non-transgender identified students (M = 57.18, SD = 12.57) reported higher school belongingness compared to transgender identified students (M = 54.52, SD = 12.79), t (16752) =13.31, p < .01. Non-transgender students (M = 76.39, SD = 27.06) also showed a significantly higher mean than transgender students (M = 66.58, SD = 20.66) for frequency of youth activism reported, t (16736) = 26.56, p < .01. However, transgender students identified students (M = 37.27, SD = 7.55) reported higher self-esteem compared to non-transgender identified students (M = 35.13, SD = 58.31), t (16745) = -18.88, p < .01.

Main Effects - Self-Esteem regressed on School Climate

Hypothesis 1a

In the first hypothesis, I proposed that high school students who reported higher levels of gender affirmative school climate reported higher self-esteem. Instead, OLS multiple linear regression results show that more gender affirmative school climate

significantly relates to negative self-esteem scores, controlling for student's grade level
(F (2, 16806) = 1473.301, $p < .01$, $R2 = .149$). More specifically both gender affirmative
school climate $b = -.335$, $t(16808) = -46.789$, $p < .01$, and grade level grade $b = -.155$, t
(16808) = -21.603 , $p < .01$ showed to be significant variables in the model (See Table
12.1). The directionality of the beta coefficient for grade indicates that high school
students in lower grade levels reported higher levels of self-esteem. More specifically,
participants self-esteem decreased -1.17 points per unit increase in grade level and
decreased -.044 points per unit increase in gender affirmative school climate scores.
Overall, the results of the regression show that GASC and grade level explain
approximately 15% of the variance in self-esteem.

Hypothesis 1b

Related, I expected that high school students who report higher levels of proximal
support for school climate correspondingly report higher self-esteem. To isolate proximal
support indicators encompassing school climate I created a composite score of the first
five indicators of the GASC scale which coincide with ontological (individual) level
support in the school ecology. This composite was used in place of the GASC scale, and
the same relationship was tested as in hypothesis 1.

Unlike my hypothesis, OLS multiple linear regression results show that more
ontological supports are associated with lower self-esteem, controlling for student's grade
level (F (2, 16806) = 1165.734, $p < .01$, $R2 = .122$). More specifically, both ontological
support $b = -.292$, t (16808) = -39.917, $p < .01$, and grade level grade $b = -.152$, t (16808)
= -20.853, $p < .01$ showed to be significant variables in the model (See Table 12.2).

Participant self-esteem decreased -1.152 points per unit increase in grade level and decreased -1.399 points per unit increase in ontological support scores. Overall, the results of the regression show that ontological support and grade level explain approximately 12% of the variance in self-esteem. Contrary to hypothesis 1b, proximal support did not show to associate with higher self-esteem, and was no more beneficial in promoting self-esteem than support derived from school climate at large.

Interaction Hypotheses - Self-Esteem

Hypothesis 3a

The first interaction hypothesis proposes that higher levels of "transgender pride" will show a moderating effect on the relationship between gender affirmative school climate and self-esteem for trans participants. When an interaction term was included in the model, no significant interaction effect was found.

Hypothesis 4a

Next, I tested if there is an interaction between youth activism (YII) and gender affirmative school climate (GASC). It may act as a buffer to improve the negative relationship between school climate and self-esteem. I proposed that higher levels of activism will moderate negative the relationship between gender affirmative school climate and self-esteem. When an interaction term was added to the model, no significant interaction effect was found.

Hypothesis 5a-b

The following regressions hypotheses were first tested among transgender identified participants, and then the process was repeated among non-transgender identified participants. First among transgender participants, I tested each interaction between similarity to peer gender groups (girls, boys, and non-binary) and gender affirmative school climate (GASC) corresponding with binary and non-binary categories, and to explore whether they moderated the negative main effect between school climate and self-esteem. I proposed that higher levels of perceived similarity for each of the three categories would show a moderating effect that improves the negative relationship between gender affirmative school climate and self-esteem. Model results show that an interaction between school climate and similarity to boys had a significant effect on self-esteem ($F_{(4, 9940)} = 300.956$, $p < .01$, $R^2 = .108$). Moreover, the simple slope plot demonstrated that this is a small effect; similar to my hypothesis the significant negative relation between school climate and self-esteem is slightly less pronounced among transgender students with higher levels of similarity to boys.

Conversely, the interaction plot shows that lower feelings of similarity to boy peers strengthens the negative relationship between school climate and self-esteem $b = .158$, $t(9940) = 4.90$, $p < .01$. This is unlike my hypothesis that proposes the interaction will change the negative direction of the relationship between school climate and self-esteem among students with higher reports of similarity to boys. However, similar to my hypothesis in that more feelings of similarity to boys attenuate the negative relationship for transgender boys.

Figure 2.1

Simple Slopes Sim to Boys predicting Self-Esteem
Transgender participants
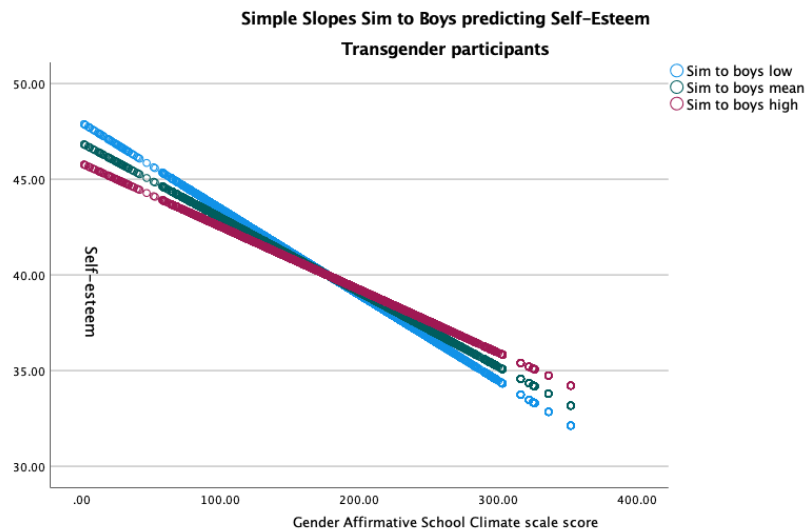
Also, model results show that there is a significant interaction between school
climate and similarity to girls on self-esteem (F (4, 9940) = 361.842 p < .01, R2 = .127).
Moreover, the simple slope plot demonstrates that this is a small interaction, the negative
relation between school climate and self-esteem is more pronounced among students with
higher similarity to girl peers. The interaction plot shows that students with higher
feelings of similarity to girl peers show a stronger negative relationship between school
climate and self-esteem b = -.415, t(9940) = -12.925 , p < .01. The association is also
negative among transgender students that score at mean and low levels on similarity to
girls, however not as strong. This is unlike my hypothesis that proposes the interaction
will change the negative direction of the relationship between school climate and self-
esteem among students with higher reports of similarity to girls. Although significant
interactions on binary indicators were found, there was no significant interaction effect

between school climate and similarity to non-binary peer group found contributing to self-esteem among transgender participants.

Figure 2.2
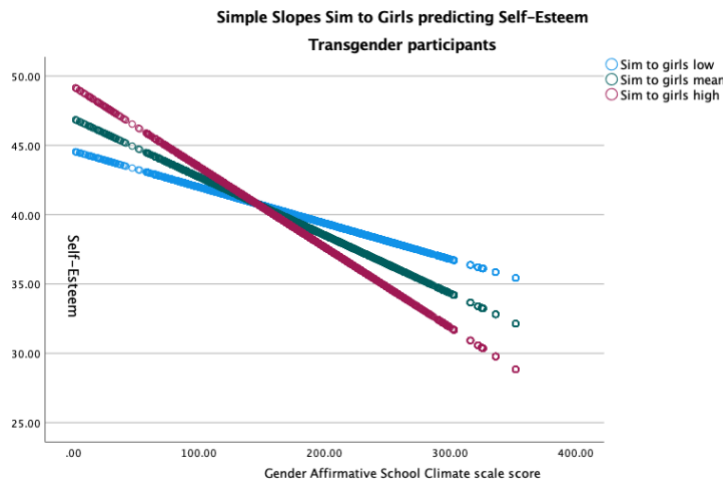
Second, this process was repeated among non-transgender identified participants. I proposed that higher levels of perceived similarity for each of the three categories would show a moderating effect to improve the negative relationship between gender affirmative school climate and self-esteem for participants with lower reports of positive school climate. Model results show that there is a significant interaction between school climate and sim to boys on self-esteem ($F_{(4, 6784)} = 432.980$, $p < .01$, $R^2 = .203$). Moreover, the simple slope plot demonstrates that this is an interaction with a small effect; unlike my hypothesis the negative relation between school climate and self-esteem is more pronounced among students with higher similarity to boys. Non-transgender identified students that reported low and mean level similarity to boys show this same overall pattern, however the negative association is slighty attenuated at each increment.

The interaction plot shows that non-trans participants that have higher feelings of similarity to boy peers demonstrate a stronger negative relationship between school climate and self-esteem $b = -.415$, $t(6784) = -10.489$, $p < .01$. The point at which the lines intersect illustrates that the value of school climate is above the mean (M=194) where the fitted response is equal across high, mean, and low groups on the proposed school climate measure. This is unlike my hypothesis that proposes that non-trans students that report the highest similarity to boys would show a weakened negative association between school climate and self-esteem, compared to participants with mean and low level of similarity to boys.

Figure 2.3
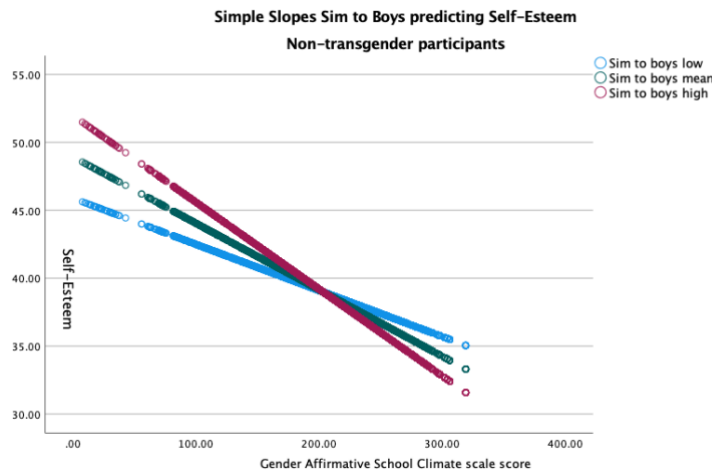
No significant interaction effects were found between school climate and similarity to non-binary peers, or school climate and similarity to girls, in the model with self-esteem among participants that are not transgender identified.

Main Effects - School Belongingness regressed on School Climate

Hypothesis 2

Hypothesis 2 proposes that there would be a positive relationship between school climate and school belongingness, such that high school students that report higher levels of gender affirmative school climate also report higher feelings of school belongingness. A multiple linear regression was calculated to regress school belongingness on gender affirmative school climate and grade level. Coinciding with hypothesis 2, a significant regression equation was found ($F(2, 16813) = 9754.987$, $p < .01$), with an R2 value of .537. More specifically, both gender affirmative school climate $b = .725$, $t(16815) = 137.163$, $p < .01$, and grade level grade $b = .050$, $t(16815) = 9.472$, $p < .01$ showed to be significant positive indicators of school belonginess in the model (See Table 12.6). Participant school belongingness increased .665 points per unit increase in grade level and increased .166 points per unit increase in gender affirmative school climate. Overall, the results of the regression show that the two variables explain approximately 54% of the variance in school belongingness.

Interaction Hypotheses - School Belongingness

Hypothesis 3b

Similarly, I proposed that higher levels of "transgender pride" will show a buffering effect on the relationship between gender affirmative school climate and school belongingness (PSSM) for participants with lower reports of positive school climate.

93

Based on previous research that suggests that the ontological indicator transgender pride contributes to the relationship between gender-related non-affirmation and wellness outcomes (Testa et al., 2015; Breslow et al., 2015), I anticipated an interaction in which transgender pride moderates the relation between school climate and school belonging. Students experiencing less systematic support in the school ecology may benefit more from higher levels of transgender pride. Model results show that there is a significant interaction between school climate and transgender pride on school belongingness ($F_{(4, 6400)} = 2833.975$, $p < .01$, $R2 = .639$). However, the simple slope plot demonstrates that this is a very small effect; unlike my hypothesis the positive relation between school climate and school belonging is slightly more pronounced among students with lower transgender pride. The simple slope plots below show that the addition of low transgender pride in the model $b = -.074$, $t(6400) = -3.46$, $p < .01$, acts as a buffer to slightly increase the strong positive relationship between school climate and school belongingness.

Figure 2.4
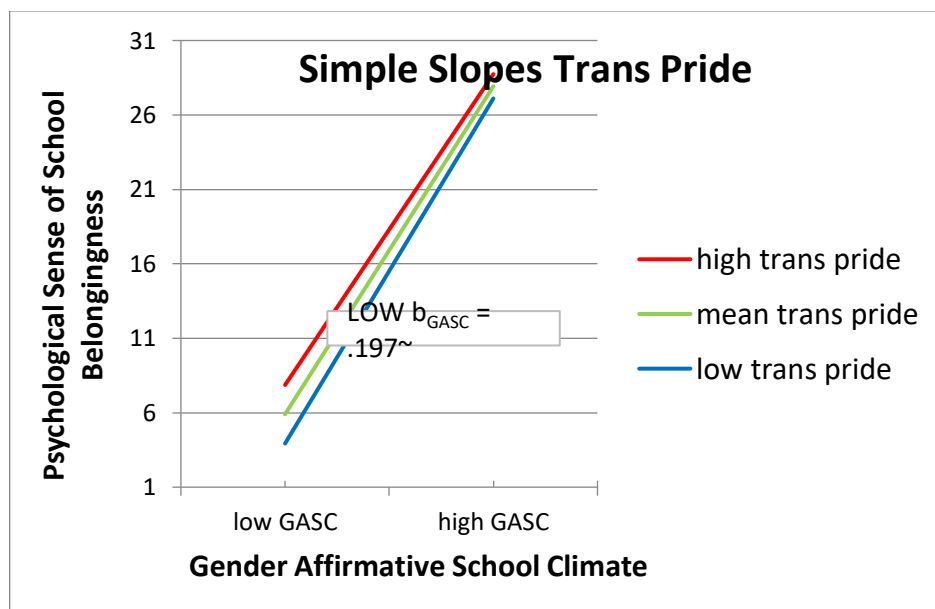
Taking a look at the second simple slope plot of this same relationship on a larger

scale we see that high, mean, and low value slopes for transgender pride are in close

proximity between each other. This confirms that this interaction effect is very small.

Figure 2.5

Hypothesis 4b

I proposed that higher levels of youth activism (YII) will show a moderating

effect on the relationship between gender affirmative school climate and school

belonging (PSSM). Based on previous research that suggests that group level indicators

similar to the construct for activism contribute to the relationship between gender-related

non-affirmation risk and wellness outcomes (Testa et al., 2015; Breslow et al., 2015), I

anticipate a significant interaction between school climate and youth activism acting to

improve the positive main effect between school climate and school belonging further.

Model results show that there is a significant interaction between school climate and

youth activism on school belongingness $(F_{(4, 16795)} = 5200.911, p < .01, R^2 = .553)$,
but not in the same direction as expected. Opposite to my hypothesis, the simple slope
plot demonstrates that the positive relation between school climate and school belonging
is more pronounced among students with lower youth activism. The simple slope plot
below shows that less participation in activism $b = -.448, t(16799) = -23.336, p < .01$,
improves the positive relationship between school climate and school belongingness.
The high, mean, and low values for youth activism (YII) intersect just above the mean
score for school climate (M=185.37, SD =57.36). The point at which slopes intersect
illustrates that the value of school climate is above the mean where the fitted response is
equal across high, mean, and low groups on the proposed school climate measure.

Figure 2.6
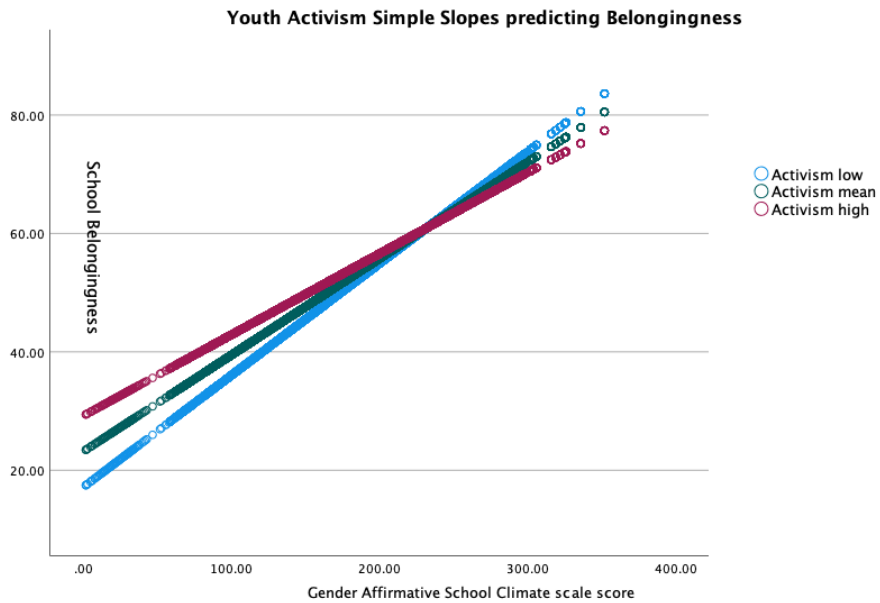
Hypothesis 6a-b

96

First among transgender participants, I tested each interaction between similarity to peer gender groups (girls, boys, and non-binary) and gender affirmative school climate (GASC) corresponding with binary and non-binary categories. I proposed that higher levels of perceived similarity for each of the three categories would show a buffering effect on the relationship between gender affirmative school climate and school belongingness for participants with lower reports of positive school climate. Model results show that there is a significant interaction between school climate and sim to non-binary on school belongingness ($F_{(4, 9940)} = 3231.073$, $p < .01$, $R^2 = .565$), however more similarity to non-binary peer groups weakened the positive association. Moreover, the simple slope plot demonstrates that this is a small interaction; the positive relation between school climate and school belonging is more pronounced among students with lower similarity to non-binary peers.

Unlike my hypothesis, the simple slopes plot of high, mean, and low values on similarity to non-binary peer group demonstrate that lower levels of feelings of similarity to non-binary peers functions to improve the relationship between school climate and belongingness among trans students. More specifically, the simple slope plot below shows that feeling less similar to non-binary peers $b = -.157$, $t(9940) = -6.880$, $p < .01$, slightly improves the relationship between school climate and school belongingness.

Figure 2.7

Simple Slopes Sim to Non Binary among Trans

Legend:
○ Sim to non-binary low
○ Sim to non-binary mean
○ Sim to non-binary high

Y-axis: School Belongingness
X-axis: Gender Affirmative School Climate scale score
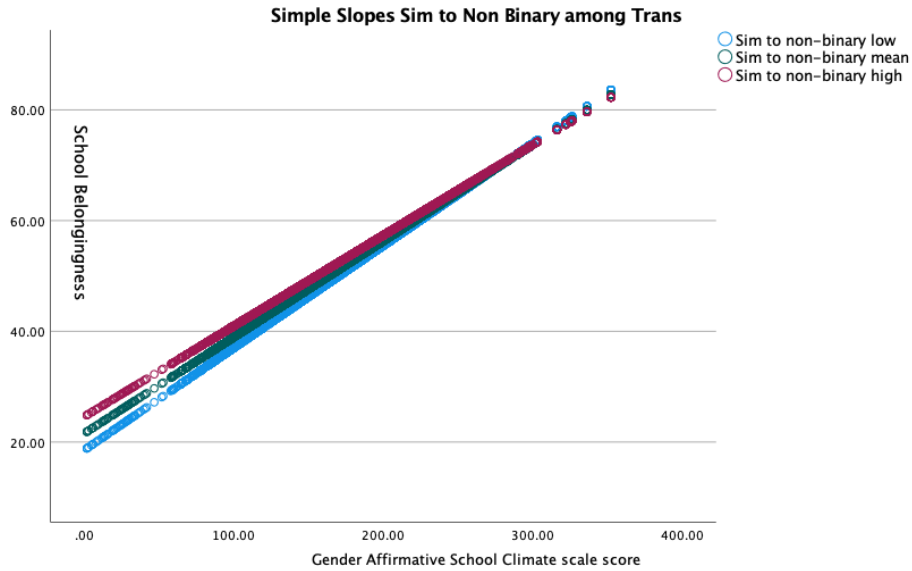
Also, opposing my hypothesis that proposes that more feelings of similarity to peer groups will show more protection, the simple slope plot below illustrates that lower feelings of similarity to girl peer groups $b = -.199$, $t(9940) = -8.726$, $p < .01$ improves the relationship between school climate and school belongingness. Model results confirm that there is a small significant interaction between school climate and similarity to girls on school belongingness ($F (4, 9940) = 3153.146$ $p < .01$, $R2 = .559$), however the effect is opposite to what was anticipated. Moreover, the simple slope plot demonstrates that this is a very small interaction, the positive relation between school climate and school belonging is slightly greater among students with lower similarity to girl peers, compared to mean and high levels. Taking a closer look, we see on the plot that the high, mean, and low values for sim to girls intersect below the mean score for school climate (M=179.44, SD =56.00), around 150.

Figure 2.8

Simple Slopes Sim to Girls predicting Belongingness
Transgender participants
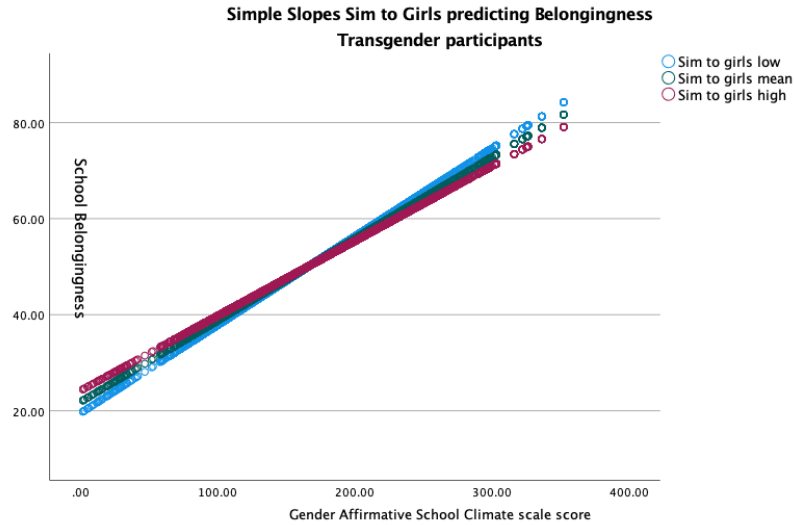
This regression procedure was repeated among non-transgender identified participants. The same pattern of protective factors was observed across transgender and non-transgender participants regressing school belongingness on school climate. I tested each interaction between similarity to peer gender groups (girls, boys, and non-binary) and gender affirmative school climate (GASC) corresponding with binary and non-binary categories. Again, I proposed that higher levels of perceived similarity for each of the three categories would show a moderating effect on the relationship between gender affirmative school climate and school belongingness, especially for participants with lo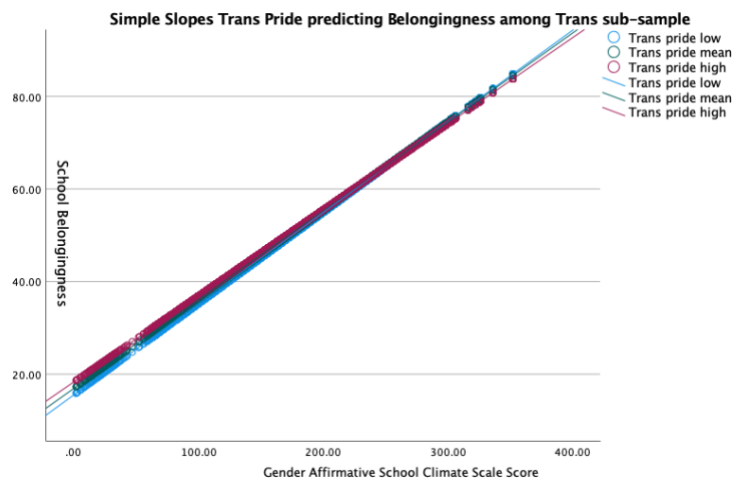wer reports of positive school climate. Model results show that there is a significant interaction between school climate and sim to non-binary on belongingness ($F_{(4, 6784)}$ = 1764.618, $p < .01$, R^2 = .510), however the effect is opposite to my hypothesis. Moreover, the simple slope plot demonstrates that this is a small interaction, the positive relation between school climate and school belonging is more pronounced among students with lower similarity to non-binary peers.

99

Opposite to my hypothesis, the simple slopes plot of high, mean, and low values on similarity to non-binary confirm that lower levels of feelings of similarity to non-binary peers functions to improve the relationship between school climate and belongingness. More specifically, the simple slope plot shows that feeling less similar to non-binary peers $b = -.110$, $t(6784) = -3.715$, $p < .01$, improves the positive relationship between school climate and school belongingness further.

Figure 2.9

Simple Slopes Sim to Non Binary predicting Belongingness among Non Trans
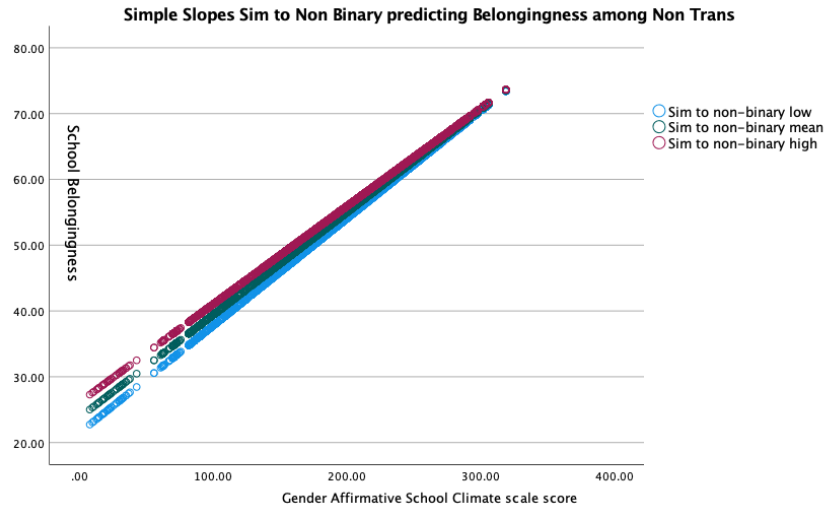
Consistent with results among transgender high schoolers, model results for non-transgender students also show that an interaction between school climate and similarity to girls has a significant effect on school belongingness ($F (4, 6784) = 1730.835$ $p < .01$, $R2 = .505$). Moreover, the simple slope plot demonstrates that this is a small interaction, the positive relation between school climate and school belonging is more pronounced among students with lower similarity to girl peers. The simple slope plot below shows

that the addition of similarity to girls in the model $b = -.084$, $t(6784) = -2.653$, $p < .01$, improves the relationship between school climate and school belongingness.

Figure 2.10

Simple Slopes Sim to Girls predicting Belongingness
Non-transgender participants
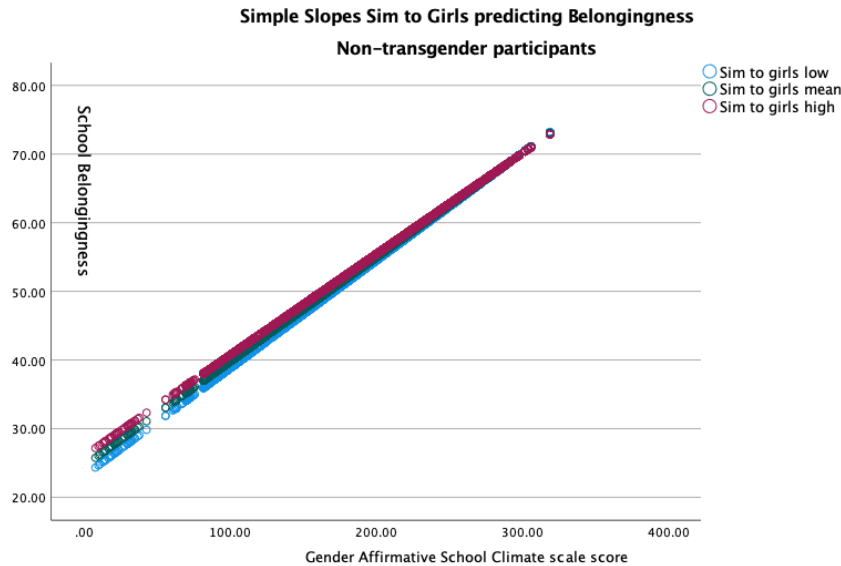
Latent Structural Equation Modeling (SEM) including Belongingness indicators

The last procedure for scale development is external focused to demonstrate the proposed school climate scale's relationship with other related phenomena. Based on the scale's Inference and Use Argument (IUA) for validity (Kane, 2013), adding the one-factor model for school belongingness (PSSM; Goodenow, 1993) to the latent measurement and structural models is intended to help confirm the extent to which the proposed school climate scale is similar to this related construct, school belongingness. More specifically, I hypothesized that Psychological Sense of School Membership (PSSM) (Goodenow, 1993) indicators would show a strong positive covariance with the

101

proposed Gender Affirmative School Climate (GASC) scale items, and adequate parsimony in fit. Related, I hypothesized that the proposed gender affirmative school climate scale would account for a moderate to high magnitude of variance with school belongingness in the latent structural model. The latent SEM modeling procedure was performed by group, among transgender and non-transgender identified participants each separately. Specific hypotheses corresponding with models for each gender group are reviewed below. To conclude, I tested gender identity as a moderator in the relationship between school climate and school belongingness, to further illustrate how gender identity contributes to this relationship.

First, among transgender identified participants, I hypothesized that indicators that make up the 4-factor model for gender school affirmative school climate and indicators that make up a 1-factor model for school belongingness would be consistent with the observed data, and a show a strong positive covariance. Further, among trans identified, I hypothesized that the proposed school climate scale will account for moderate – high magnitude of variance in the model with school belongingness.

The structural path model was estimated based on the best fitting measurement model. After re-specification item residual error correlations were added among four items (84, 85, 97, 89) on the PSSM scale (Goodenow, 1993) based on areas of strain identified among residual covariance values. All residual covariances assigned reached a threshold, exceeding .200, and most relationships were positive denoting that the two items share some information that is not accounted for in the latent factors. For example, item 97 (*People at my school know that I can do good work.*) with item 84 (*People at my school notice when I am good at something.)* showed the highest residual covariance in

102

model 1 for transgender participants, approximately .423. Taking a closer look at the content of the items it is evident that these questions are very similar, each prompts participants to speak to whether people at school acknowledge their abilities. A complete list of residual correlation parameters added to models after re-specification is included in the appendix. Model 4 showed to be the most parsimonious measurement model after re-specification (χ^2 = 5196.895; N = 377; CFI = .857; RMSEA = .059; SRMR = .060). After review for overall measurement quality, there are low factor loadings on item 89 (B= .208; p < .01; *There is at least one teacher at school I can talk to if I have a problem*) and item 93 (B= .363; p < .01; *I am treated with as much respect as other students in my school*) of the PSSM scale that may be contributing to overall fit.

The structural model shown in Figure 7.2 showed acceptable fit between the model and the observed data (χ^2 = 5196.894; N = 377; CFI = .857; RMSEA = .059; SRMR = .060). The proposed gender affirmative school climate scale significantly accounted for 85% of the variance in school belongingness ($R2$= .85; p < .01). Overall, latent factor variance shows that the PSSM scale (Goodenow, 1993) indicators accounted for 72.3% of the variance in school belongingness. Based on the results I conclude that the null hypothesis is rejected, model estimates sufficiently reproduce the sample variances and covariances. My hypothesis (among the transgender group) is confirmed that the proposed GASC scale demonstrates convergent validity through its significant positive relationship to a related construct, school belongingness.

Second, among non-transgender identified participants, I hypothesize that indicators that make up the 4-factor model for gender school affirmative school climate and indicators that make up a 1-factor model for school belongingness would be

103

consistent with the observed data, and a show a strong positive covariance. Further, among non-transgender identified, I hypothesized that the proposed school climate scale would account for moderate – high magnitude of variance in the model with school belongingness.

Despite efforts to improve overall model fit of the measurement model (χ^2 = 5859.503; N = 269; CFI = .840; RMSEA = .078; SRMR = .102) by adding residual covariances on relationships that showed the most strain, the re-specification procedure did not yield adequate fit (χ^2 = 5822.108; N = 269; CFI = .841; RMSEA = .078; SRMR = .100). Item residual error correlations were added among three items (88, 85, 91) on the PSSM scale (Goodenow, 1993) based on areas of strain identified among residual covariance values. All residual covariances added reached an extreme residual threshold, exceeding .500, and most relationships were positive denoting that the two items share some information that is not accounted for in the latent factors. For example, item 88 (*Sometimes I feel as if I don't belong in my school*) with item 98 (*I wish I were in a different school)* showed the highest residual covariance in model 1for non-transgender participants, approximately .872. Taking a closer look at the content of the items at first, it's not so clear why the residual is so high here, each question touches on distinct content. Perhaps non-transgender identified high school students are not desensitized to feeling like they don't belong, so there isn't as much as a discrepancy between feeling like you don't belong, and wishing you are at a different school. A complete list of residual correlation parameters added to models after re-specification is included in the appendix. After re-specification on Model 4 (non-transgender group) more residual

correlations remain among indicators between the value of .05 and .500 that are contributing to model misfit and overall parsimony.

Beyond model fit statistics, there are important distinctions in the overall measurement quality of the non-transgender measurement model compared to that of the transgender group which are contributing to a less parsimonious solution. Unlike the transgender group model, there is one low factor loading among school climate scale indicators, on question 32 (B = .298, p < .01; *Among peers at school I have witnessed comments or behaviors that convey insensitivity, or invalidate the thoughts, feelings, or reality of marginalized gender identities (including cisgender and gender diverse).* These results suggest that perceptions of gender-related micro-aggressions may not be as heightened for non-transgender high-schoolers, or correspondingly, that micro-aggression experiences are not as salient in informing the school climate of non-transgender students. Also distinct from the transgender group model, 8 out of 18 factor loadings on school belongingness indicators are under .40, including items 85 (B = .223, p < .01), 87 (B = .375, p < .01), 88 (B = .313, p < .01), 89 (B = .336, p < .01), 91 (B = -.023, p > .05), 94 (B = .336, p < .01), 97 (B = .307, p < .01), and 98 (B = .165, p < .01). The lowest magnitude indicator, item 91 (B = -.023, p > .05; *Teachers here are not interested in people like me*), does not significantly load on the latent factor for school belongingness, and the negative direction of this relationship implies that this indicator has an opposing relation to school belongingness. Within a covariance model that relates school belongingness to school climate questions specific to the domain of gender, this question may work more optimally among students that are among the most marginalized gender identities.

105

Finally, across non-transgender and transgender measurement models there are important distinctions in how much variance in school climate is significantly accounted for by the four latent domains, agency (factor 1), peer bullying (factor 2), exo-supports (factor 3), and felt pressure to gender norms (factor 4). Unlike the transgender measurement model, latent variable variance on factor 2, peer bullying (variance=.001; S.E. = .003; $p > .05$), and factor 4, felt pressure to gender norms (variance=.015; S.E. = .014; $p > .05$), do not account for a significant amount of variance in the proposed gender affirmative school climate latent domain. These results have significant implications which oppose my hypothesis that convergent validity would be demonstrated by including the belongingness scale in latent models among non-transgender participants. Rather, results show that latent sub-domains peer bullying (factor 2) and felt pressure to gender norms (factor 4) are not consistent with the observed data, suggesting that these facets of school climate are unrelated to feelings of belongingness among non-transgender identified participants.

At the same time, results from the structural model among non-transgender participants show that the proposed gender affirmative school climate scale significantly accounted for 76.2% of the variance in school belongingness ($R2 = .762$; $p < .01$). Despite strain on factor 2 and 4, the remaining school climate indicators are informing the significant correlation between school climate and school belongingness. Overall, latent factor variance in the structural model shows that the PSSM scale (Goodenow, 1993) indicators significantly accounted for 58.1% (SE =.057, $p < .01$) of the variance in school belongingness. Still, the structural model for non-transgender participants shown in Figure 8.0 showed poor fit between the model and the observed data ($\chi^2 = 5822.108$; N =

106

269; CFI = .841; RMSEA = .078; SRMR = .100). Based on the results I conclude that the null hypothesis is not rejected, model estimates do not sufficiently reproduce the sample variances and covariances. My hypothesis (among the non-transgender group) that the proposed GASC scale demonstrates convergent validity through its positive relationship to a related construct, school belongingness, is not confirmed.

Last, potential individual level and group level protective factors anticipated to influence the extent to which perceptions of school climate inform student wellness outcomes (self-esteem and school belonging) were added as moderators to the latent structural models. For the sake of time, only one hypothesized interaction model that tests if transgender pride (Bockting et al., 2020) acts as a moderator in the relationship between the proposed school climate scale and school belonging, is included in this manuscript. Preliminary Ordinary Least Squares (OLS) regression analysis presented previously showed a small interaction. This confirmed that higher levels of transgender pride act to improve the relationship between school climate and belongingness, but only among students who reported the poorest conditions for school climate. However, taking a closer look at the latent model structural model, transgender pride did not significantly moderate (b=.129; SE = .07; p = .066) the relationship between school climate and school belongingness, only a marginal interaction was shown. Incrementally, confidence interval estimates for the interaction coefficient pass through 0 from lower to upper bound, confirming that there is not a significant interaction.

CHAPTER 4

DISCUSSION

Transgender identified high school students are more likely to report negative perceptions of school climate compared to non-trans students (Day, Perez-Brumer, Russell, 2018), however there is a gap in the literature on what constitutes school climate support specific to the domain of gender. Unique from risk factors approaches to assessing school climate for gender diverse students (Pampati et al., 2020), the central aim of the current study was to identify protective factors within a developmental system ecology of the high school context. Protective factors emerged in two ways, internally throughout the scale development phase when indicators of school climate were developed, and externally, by examining moderators contributing to the relationship between school climate and student wellness outcomes. For example, during the scale development phase the content of most indicators on the proposed scale focus on protective factors within the school ecology that contribute to a school climate of gender. Later on, proposed individual and group level protective factors indirectly related to the school ecology were introduced to the model (i.e. trans pride, youth activism, similarity to peer group gender); accordingly, their indirect protective contribution was tested by including these factors as moderators. Though the minority stress approach is critical and necessary, it is more oriented to revealing stress than protective factors. Alternative to minority stress approaches that work well in tandem with ecological system frameworks (Eisenberg et al. 2019), the gender affirmative model (GAM) was overlayed on the ecological-transactional model to reveal support by contextual levels at school, among transgender and non-transgender identified high school students.

To accomplish these goals a mixed methods approach was chosen to facilitate the scale development process, including a cognitive interview and pilot self-report survey

procedure for the pilot phase of the study, and a self-report survey for the primary phase of the study. The results provide insight about ways that high schools can be pro-active to initiate and promote a healthier school climate for all students, prioritizing the needs of transgender identified students. Together, developmental systems frameworks and the gender affirmative model (GAM) share a dialectical approach which highlights what schools can do to help. Moreover, this approach encourages schools to be conscious of their ability to promote high school student experiences and perceptions related to gender inclusion, equity, and diversity (Ullman, 2018; Luecke, 2018).

The Development of a School Climate Scale of Gender

The four-factor model for the proposed gender affirmative school climate scale was distinct from the initial hypothesized factor structure. I hypothesized a five-factor model in which each latent domain coincides with a contextual level of an ecological-transactional (Lynch & Cicchetti, 1998) school ecology, including the meso-system of the school and the home. Although I proposed that factors would be organized by contextual level of the school ecology (Lynch & Cicchetti, 1998), only two of the four factors adhere to this organization in their content. For example, factor 1 (gender agency) can be broken down into 3 sub-domains by contextual level, questions at the individual, micro-system, and school structures and spaces level. Likewise, factor 3 (exo and meso-supports) included indicators that probed about school supports at the exo and meso-system levels. However, factor 2 (peer bullying and victimization) and factor 4 (felt pressure conform to gender norms) did not correspond with contextual levels of an ecological-transactional ecology.

Interestingly, although "gender agency" was hypothesized to be specific to the ontological domain (individual contextual level of ecology), later on in scale development "gender agency" emerged as a latent domain among items that touch on topics across contextual levels. Agency did not show to be specific to the individual level of school climate as first hypothesized. In addition to the ontological domain, indicators highlight and ask about the extent to which teacher and peers (micro-level), and structures and spaces (i.e. bathroom guidelines, school media circulated online and inside school, school code of conduct guidelines) promote students' agency to identify in their gender identity, find relationships that are affirming, and to participate in class and activities, including sports. Resembling the transactional component of the GAM and the ecological-transactional approach the "gender agency" factor takes into account the way that both students' perception of experiences at school and the reactions of the school environment (Malpas, Glaeser, & Giammatei 2018; Malpas 2011) inform a students' sense of who they are, and what role they play in school spaces. Furthermore, these findings which highlight the contribution of "gender agency" across contextual levels provides important insight about what schools can do to be pro-active to initiate a positive school climate. The content of indicators informing this domain demonstrates the importance of communication in relationships with teachers and peers, as well as structures and spaces such as bathroom policy, and school media circulated through e-mail to contributing to student's individual sense that they are an agentive member in the school community.

A multi-group Confirmatory Factor Analysis (CFA) approach to measurement invariance was chosen to assess whether the factor structure and measurement quality

110

differed by gender group, using transgender and non-transgender identified sub-samples. In this process, first baseline measurement models for each gender group were established. Second, configural, metric and scalar equivalence across transgender and non-transgender groups were tested. While the measurement invariance procedure confirmed that the transgender and non-transgender sub-sample measurement models meet the criteria for "weak factorial invariance", there were important distinctions between the two groups in measurement quality and model fit.

Questions that interrogated gender-related risk in peer relationships and felt-pressure to gender norms from peers and professionals at school, showed to have more salience contributing to the school climate of transgender identified participants, than for non-transgender identified participants. Still, more research is needed to determine if the scope of school climate for gender diverse students is similar to that of cisgender students, and if transgender identified students have unique experiences overall. While the first-order four factor measurement model including four latent domains demonstrated moderate to high factor covariances for the transgender identified sub-sample, model fit and measurement quality, including factor correlations, are less optimal for the non-transgender student sub-sample. Further investigation to test the baseline second-order measurement model for the transgender and non-transgender sub-samples will help conclude whether a total scale score can be used for non-transgender identified participants. For the current project, re-specification of baseline CFA models of the proposed school climate measure (each for transgender and non-transgender groups) focused on the development of the first order four factor models. So, the second-order

latent measurement and structural model of the proposed school climate measure was only examined when the school climate construct was related to school belongingness.

Unique from the transgender sub-sample, the non-trans sub-sample's factor correlations show that there is no relation between latent domains "gender agency" and "peer bullying and victimization", or "exo and meso support" and "felt pressure to conform to gender norms". In retrospect it makes sense that there is not an overlap between having a sense of autonomy across school spaces and peer bullying specific to gender for non-trans students because non-transgender identified students experience less risk across contextual levels (Greytak et al., 2009; Johns et al., 2018). Thus, non-trans students' agency is less informed by experiences of risk, like that of transgender identified students. In line with these results research suggests that LGBTQ students who report more affirmative school supports correspondingly report more positive perception of school safety (Greytak, Kosciw, & Boesen, 2013; DePedro, Lynch, & Esqueda, 2018) and less bullying (Day, Fish, Grossman & Russell, 2019). Similarly, perhaps felt pressure to conform to gender norms corresponds with exo and meso-system support only for transgender students because the pressure to conform to traditional gender roles is more at odds with feelings of a positive school climate for this group. For example, reporting feelings of support on exo-level items that interrogate the extent to which curricula challenge traditional gender stereotypes within and across subject domains, (by covering why gender stereotypes exist, and deconstructing their connection to social norms) may correspond less with non-trans student' felt pressure to conform to gender norms because it may be less urgent to need to experience a sense of "gender agency" if students' gender identity and experiences align more with traditional scripts in the first place. While

112

research shows that "agency" emerges as an important feature of protection for transgender students in schools that facilitates positive school climate (Ullman, 2018; Luecke, 2018), more research is needed to explore how this domain of gender informs school climate for non-transgender identified high school students. Although "gender agency" did not correlate with all factors in the measurement model for non-transgender students, it did show to be a strong indicator of school climate in the second-order structural model for both trans and non-trans sub-samples. Going forward, taking a closer look at the second-order measurement model without school belongingness included will help to confirm how much variance each of the four factors contributes to the model among trans and non-transgender students.

Furthermore, these results have significant implications which oppose my initial hypothesis that convergent validity would be demonstrated by including the belongingness scale in latent models among non-transgender participants. Rather, factor correlation results suggest that the facets of school climate "peer bullying and victimization" and "felt-pressure to conform to gender norms" are unrelated to feelings of belongingness among non-transgender identified participants.

Student Wellness Effects - Self-Esteem

The next phase of the current study was external focused. Self-esteem (S-E) was the first outcome measure examined for main effect and interaction hypotheses including individual (transgender pride) and group level protective factors (youth activism and similarity to peer group gender). The following section reviews mains findings for main

effect and interaction hypotheses which relate self-esteem to the proposed school climate measure.

First, the results were not consistent with my main effect hypothesis that students who report more positive gender affirmative school climates will correspond with higher self-esteem (S-E). Instead, the relationship between the proposed GASC scale and S-E was negative, controlling for grade level. High school students that reported more positive school climate reported lower self-esteem scores. It is possible that students with higher self-esteem have a heightened awareness about school climate limitations, and more clarity to speak up on school climate concerns. Also, results showed that the lower participants grade level, the higher reported self-esteem. Accordingly, may be younger high school students have the memory of past school experiences to relate their high school experiences to are reporting more school climate challenges. Partially supporting the current study's results, Taylor et al. (2020) research showed that social supports at school were only positively related to self-esteem among non-transgender LGB students, but not for that of transgender identified students.

Supplementary hierarchal regression analyses (beyond intent of main hypotheses) were carried out separately for transgender and non-transgender identified sub-groups to observe if the negative relation held among each gender group, controlling for grade level. Both transgender and non-transgender sub-samples showed a negative main effect relationship between the proposed school climate scale and self-esteem, unlike Taylor's et al. (2020) results which only showed a positive relation between school supports and S-E among non-trans LGB students. Prior research that shows that school supports have a positive relation with S-E (Kosciw et al., 2013), while school risks have negative relation

with S-E (Blais, Gervais, Herbert, 2014), suggests that it would be beneficial to look at the latent association between each sub-scale and S-E. Preliminary correlation analyses for transgender and non-transgender identified sub-samples are similar; both show that the relationship between GASC "peer bullying" scores and S-E scores was negative and low-moderate in magnitude. Perhaps the negative relationship shown between the proposed school climate measure and S-E is amplified for students that score more poorly on the "peer bullying and victimization" sub-scale, akin to literature that shows peer bullying and victimization are negatively related to S-E for trans and LGB students (Kosciw et al., 2013; Blais, Gervais, Herbert, 2014).

One sub-domain of the proposed school climate scale was used to relate to self-esteem, comprised of five individual level indicators aggregated into a composite score. Based on research that shows that more proximal components of school climate correspond more with student wellness outcomes than distal level factors (De Pedro, Lynch, and Esqueda, 2018; Greytak, Kosciw, and Boesen, 2013), I hypothesized that proximal support sub-domains would correspond more positively with self-esteem, than distal level sub-domains. However, contrary to my hypothesis, more proximal support did not show to coincide with higher self-esteem, rather the relationship was negative. As result, I conclude that proximal support specific to the ontological domain was not any more beneficial in promoting S-E than support derived from school climate at large. Both individual level contextual supports (proximal composite) and school climate overall (school climate total scale score) each negatively corresponded with self-esteem scores. These results suggest that students with higher self-esteem were reporting more individual level challenges corresponding with the content that these five questions touch

on, like "the freedom to live in the gender that is most real and comfortable" (item 20), or whether gender questioning is considered acceptable at school (item 22). Going forward, expanding the proximal composite to include indicators from the micro-system (i.e. teacher support indicators including items 43, 45, 46, 49, and 50) would help to confirm if more proximal supports are more or less salient than school climate at large in informing student self-esteem. Likewise, De Pedro, Lynch, and Esqueda's (2018) study shows that proximal supports including teacher interventions and peer interventions showed to be related to higher levels of perception of safety among LGBTQ youth, while a protective factor from a more distal level, GSA presence, was negatively related to feelings of safety.

Next, I aimed to identify individual and group level protective factors that may contribute to the process by which school climate relates to self-esteem. Most hypotheses were carried out separately for each gender group, transgender and non-transgender identified, so that comparisons could be drawn. Among the transgender group, a small moderation effect was found between the proposed school climate scale and similarity to peer group (boys). Though all groups demonstrated a negative relationship between school climate and S-E, the negative relationship was slightly less pronounced among transgender students with high reported similarity to boy peers. This supports my hypothesis that more perceived similarity to binary group genders will improve the relationship between school climate and self-esteem. Since a large portion of transgender identified participants are transgender male, perhaps perceived similarity to peer boys is protective in school environments to help gain acceptance in peer groups where their membership may be challenged by cisgender peers. Johns et al. (2021) study highlights

116

how both proximal and distal school factors inform transgender students reported experiences of exclusion and isolation, such as microaggression from peers and bathroom policies.

Related, recent research suggests that many trans children essentialize gender similarly to cisgender children (Gulgoz et al., 2019; Gulgoz et al., 2019), however more research is needed to explore how feelings of similarity to binary identified peer groups informs perceived trans student wellness, and their experience of school climate. Preliminary correlations show that there is no significant relationship between feelings of similarity to peer group (boys) and self-esteem among transgender students, but there is a significant low-moderate negative relationship among non-transgender students. For trans identified participants these findings demonstrate that the relationship between feelings of similarity to peer groups (boys) and perceived self-esteem is more complex than what a main effect relationship implies. These results suggest that there is no causal link implied between feelings of similarity to peer group gender (boys) and perceptions of "self" like some research that suggests that binary gender in and outgroup membership status influences self-esteem (Falomir-Pichastor & Mugny, 2009). Instead, feelings of peer group similarity act as a protective factor to improve the school climate of gender by acting upon its association with S-E. Distinct from social identity theory's concept of gender (Tajfel & Turner, 1986), transgender identity is not defined by the boundaries of gender in and outgroups (Serano, 2007), despite high school students demonstrated preference for ingroup and outgroup status to be defined by gender at school (Eckes, Trautner, & Behrendt, 2005). Rather, transactional theory emphasizes a

117

phenomenological agentive feature derived from developmental systems (Sameroff 2009; Ehrensaft, 2011) in which individual perception is not subordinate to social context.

Opposite to these findings and my hypothesis, an interaction between school climate and similarity to peer group (girls) demonstrated that the negative relationship between school climate and S-E is most pronounced among trans high school students with high reported similarity to girls. That is, all students show a negative slope between the GASC total score and S-E, but the negative slope was most pronounced for trans students that reported the highest feelings of similarity to girl peers. Because a small portion of transgender identified participants are transgender female, perhaps perceived similarity to peer girls is creating strain in school environments for trans male highschoolers who are trying gain more acceptance in male peer groups. Many participants are transgender non-binary identified, so it is less clear why similarity to boys may help to alleviate school climate challenges for this group, while similarity to girls makes challenges more pronounced.

Also unlike my hypothesis for the transgender group, similarity to peer group (non-binary) did not moderate the relation between proposed GASC scale and self-esteem. Likewise, the individual level protective factor "transgender pride" did not moderate the relationship between school climate and S-E. These results were a surprise because it was anticipated that trans pride would be positively correlated with self-esteem among the trans identified group, however higher feelings of trans pride associated with lower feelings of self-esteem. The group-level protective factor "youth activism" also did not moderate the relationship between school climate and S-E. Although this indirect relationship was only tested among the sample at large, correlations show important

118

differences by gender group in the magnitude of the positive direct relationship between school climate and youth activism. For non-transgender participants there is a moderate positive relation suggesting that there is more overlap between the extent to which students are active in the school and community and a positive perception of school climate for this group. Going forward, further analysis drawn from the "school activism" sub-scale of the YII (Pancer et al., 2007) can be applied to determine if school related activism is more salient of a protective factor than youth activism overall.

The contribution of similarity to peer group gender (boys, girls, non-binary) as a moderator also was examined among the non-transgender group. I expected that more perceived similarity to binary group genders will improve the relationship between school climate and self-esteem. Unlike my hypothesis and results among the transgender group, the negative relationship between the proposed GASC and S-E was apparent for all students. Moreover, the association was *strongest* among students who reported high similarity to peer group gender (boys). While higher similarity to peer group gender (boys) alleviated some strain from the influence perceived school climate has on self-esteem among transgender students, feelings similarity to boys created more strain among non-transgender identified students. Because the largest proportion of transgender identified students in the sample identified "transgender male", these findings further demonstrate that trans male high school students uniquely benefit from perceived similarity to "boy" peers within the school ecology. Whereas feelings of similarity to boys may be creating more strain among non-transgender identified participants because traditional male roles are at odds with what constitutes a gender affirmative school climate. Research shows that cisgender adult men report more transphobia and traditional

119

gender attitudes than cisgender women (Brassel and Anderson, 2019), and that more feelings of similarity to male peer group gender leads to more transgender prejudice (Anderson, 2018). However more research is needed among adolescent cisgender and transgender boys in the high school context to explore the contribution of feelings of similarity to gender peer groups, and the contribution of acceptance (or exclusion) in male peer groups, to the relationship between perceived school climate and self-esteem. In the primary study there about three times as many transgender males (301) compared to non-transgender identified males (82), so results may be biased towards the sub-sample with more participants. Overall, results suggests that there is a need for more data on school climate that captures student gendered beliefs and attitudes, such as gender stereotyping, to explore if there is an overlap between feelings of similarity to peer group (boys) and traditional gendered attitudes among cisgender high school boys. Cisgender students that have adopted more cognitively rigid gendered ideas of masculinity than flexible ones, such as the belief that men belong in the math in sciences, may also show a heightened sense of ingroup (boy) membership because it is easier to conflate these two domains if your gendered expression was always aligned with your group status. Similarly, feelings of ingroup membership among non-transgender identified boys may be amplified or clouded by toxic masculinities in high school peer group discourse that include devaluing anything considered "feminine". Alternatively, it's important to point out that the majority of the non-transgender sample did not identify as binary male (82 are male identified), so moderation results may speak more to female, non-binary, genderqueer, and other diverse student experiences that made up the non-transgender sample, than that of cisgender and other binary identified males.

120

Unlike my hypothesis, similarity to peer group (girls) and similarity to peer group (non-binary) each did not moderate the relationship between the proposed school climate measure and self-esteem among non-transgender identified participants. While more feelings of similarity to peer group (girls) made the negative relationship between the proposed GASC and S-E more pronounced for transgender high schoolers, this interaction did not show for the non-transgender group. It was hypothesized that feelings of similarity to peer groups based on gender would help to alleviate stress in the school ecology among non-transgender students, however findings suggest that feelings of similarity to peer groups based on gender do not interact to inform self-esteem for this sub-sample. Rather, among non-transgender identified students feeling similar to boys created more strain, dampening self-esteem scores further.

Student Wellness Effects - School Belongingness

School belongingness was the second outcome measure observed corresponding to main effect and interaction hypotheses including individual (transgender pride) and group level protective factors (youth activism and similarity to peer group gender). Unlike self-esteem, latent structural equation modeling (SEM) was also carried out to observe how the proposed school climate measure relates to a similar construct, school belongingness. This fulfilled a measurement purpose to examine the convergent validity of the school climate measure to a related phenomenon.

First, main effect relationship and interaction hypotheses were tested using OLS regression. I expected that participants that report more positive school climates will also report more positive feelings of school belongingness. In line with my main effect

121

hypothesis, the proposed school climate measure showed a moderately strong positive relationship with school belongingness (R2 showed 54% variance accounted for in the model), such that students that reported more positive conditions for school climate correspondingly reported higher school belongingness. Latent modeling subgroup analyses by gender showed that there is a slightly higher correlation between the proposed GASC and school belonging for transgender students, however the relationship was also high for the non-transgender sub-sample. These results are similar to past research that shows that more school supports are related to increased sense of school connectedness among LGBTQ (Bullock, 2018) and high school students at large (Day, Snapp, & Russell, 2016).

There are important distinctions between the non-transgender and transgender sub-sample latent measurement and structural models that impacts the convergent validity of the scale for non-transgender identified participants. School belongingness was chosen to be added to the model for each sub-sample since its latent content encompasses related phenomena to that of school climate constructs (Ullman, 2022). For transgender participants, results demonstrate that the four latent domains that encompass indicators of gender affirmative school climate, all together, are related to feelings of belongingness at school. Thus, among the trans sub-sample, the breadth of a positive school climate of gender overlaps with feelings of belongingness. However, taking a closer look at the latent structural model for non-transgender identified participants reveals that "peer bullying and victimization" and "felt-pressure to gender norms" are not significant indicators of the second-order structure of school climate that is informing school belongingness. Only "gender agency" and "exo and meso-system support" are

significantly related domains for the non-transgender sub-sample. These results have

significant implications which are inconsistent with hypothesis that convergent validity

would be demonstrated by including the belongingness scale in latent models among non-

transgender participants. Rather, results suggest that these facets of school climate are

unrelated to feelings of belongingness among non-transgender identified participants. See

scale development conclusions for more elaboration here.

Next, I aimed to identify individual and group level protective factors that may

contribute to the process by which school climate relates to school belongingness. Unlike

previous research among adults which shows that the ontological variable "transgender

pride" improves the relationship between gender-related non-affirmation and wellness

outcomes (Testa et al., 2015; Breslow et al., 2015), participants with low transgender

pride showed a stronger positive relationship between the proposed school climate scale

and school belonging, among the trans sub-sample. Unlike my moderation hypothesis,

the positive relationship between the proposed GASC and school belonging held for all

students and was slightly more pronounced among students with lower scores for

transgender pride. Interaction plots demonstrate that this moderation is very small.

Theoretically, when given an opportunity to learn in an environment that facilitates a

supportive school climate of gender, transgender students with a strong sense of pride in

their identity can better use these resources to inform a more positive sense of school

belongingness. Unlike Testa's et al. (2015) study that suggested that trans pride and

social supports alleviate minority stress, interaction results showed that lower feelings of

transgender pride helped transgender students feel a greater sense of school belonging. At

the same time results highlight the importance of having a positive school climate, since

123

students with low, mean, and high levels of trans pride all showed a strong positive relation between the GASC and school belonging.

The latent structural interaction model demonstrated only a marginal interaction for trans pride with the proposed school climate scale, when associated with school belongingness, unlike the OLS regression procedure. These results further conclude that transgender pride was not a significant contributing factor of individual level support impacting the relationship between perceptions of school climate and feelings of belongingness at school. Furthermore, the latent measurement model showed no correlation between latent domains "GASC scale" and "Trans pride", or between latent domains "Trans pride" and " School Belonging".

Unlike previous research which shows that group level variables similar to the construct "activism" improves the relationship between gender-related non-affirmation and wellness outcomes (Testa et al., 2015; Breslow et al., 2015), higher "youth activism" dampened the positive relation between the proposed school climate scale and school belonging. However, this indirect relationship was only tested among the sample as a whole, so conclusions about differences by gender group cannot be drawn yet here. T-tests that showed that transgender identified students reported significantly less youth activism on average compared to non-transgender identified students revealed that this group's skew in score is likely influencing the direction of the moderation. Going forward, further analysis drawn from the "school activism" sub-scale of the YII (Pancer et al., 2007) can be applied to determine if school related activism is more salient of a protective factor than youth activism at large.

Next, moderation hypotheses that add "similarity to peer group gender" were carried out separately for each gender group, transgender and non-transgender identified, so that comparisons could be drawn. Inconsistent with my hypothesis for the trans sub-sample, an interaction between school climate and similarity to peer group (non-binary) demonstrated that the positive relationship between the proposed school climate scale and school belonging is more pronounced among high school students with less reported similarity to non-binary peers. Overall, the positive relation between GASC and school belonging held for all levels of similarity to peer group (non-binary). Similarly, for the trans sub-sample the positive relationship between the proposed GASC scale and school belonging is stronger for students with lower reported similarity to girls. Overall, the positive relation between GASC and school belonging held for all levels of similarity to peer group (girls). Finally, there was no interaction present for similarity to peer group (boys) for the transgender or non-transgender sub-samples. Although feelings of similarity to boys helped to inform more positive self-esteem for trans high schoolers, feelings of similarity to boys did not interact with school climate to promote a sense of school belongingness.

The non-transgender sub-sample interaction results which regress school belonging on school climate by each of the three similarity to peer group gender moderators (girls, boys, non-binary), showed the same pattern as the transgender sub-sample.

Limitations

There were sampling limitations that influenced the diversity of participants in the pilot and primary studies. While it is not clear what algorithms Instagram uses to attract views on advertisements, one pattern that was seen is that advertisements seem to act as a snowball to attract viewers with similar characteristics to those who have engaged with the ad more frequently. Related to this pattern, the advertisement that targeted "transgender" students received about five times more engagement than ads targeted at cisgender and non-binary students in each recruitment phase. Despite the high amount of engagement on transgender Instagram ads, a small amount of "transgender females" were recruited in each sample, compared to "transgender males" and "transgender non-binary" identified participants. A similar trend was demonstrated in previous research that recruited a large transgender sample using Instagram and Facebook ads (Salk, Thoma, Choukas-Bradley, 2020). Similar to this disparity, the amount of "cisgender males" recruited in each self-report sample was sparse. In future studies a separate Ad should be created for transgender females to try to compensate for this sampling discrepancy. Since a specific Ads were created to target cisgender males but sampling challenges persisted, perhaps cisgender male students were less likely to complete a school climate scale specific to the domain of gender because their gender is dominantly positioned in the first place.

Although a moderate amount of students indicated that they are more than two races in both self-report samples, the majority of students from each data collection reported that they are White. Related, there was some diversity reported in the ethnic composition of high schools attended, with some students reporting that they attend schools with a mix of Latino, Hispanic, and/or Spanish peers and faculty, however the

126

majority of students from each self-report sampled reported that they attend a high school made up of a majority of non-Latino, Hispanic and/or Spanish peers and faculty.

Next, the majority of participants across samples reported that they attend a school in a community that is suburban or urban, with a small percent of students reporting that they are from rural communities. This is a common gap in school climate literature that focuses on transgender identified students (Eisenberg et al., 2019) that may be creating critical limitations in empirical data that explores the extent to which gender diverse students are receiving systematic support in high school spaces across the United States. Especially in places that may be isolated from school support resources, or more impacted by regional discourses which encourages conservative beliefs in gender ideology. In addition to this, high school freshman were under sampled throughout scale development because of IRB limitations that only waived parent consent for participants 15 years of age and up.

There are important methodological challenges that created limitations for scale development. First, multiple imputation presented challenges and a road-block during the re-specification procedure to improve the model fit of baseline CFA models, and to compare nested models for the measurement invariance procedure. "Mod Indices", which help to pinpoint the strongest areas of measurement strain, are not available in Mplus for multiple imputed data. Instead, overall measurement quality was assessed by taking into account standardized factor loadings, residual variances, residual covariances, and model fit (such as improvement of the chi-square statistic suggested by a drop in magnitude). Also, chi-square difference statistics between each nested model could not be calculated due to complications that multiple imputation and WLSMV estimation jointly present.

127

Rather, a pooled chi-square estimate needs to be calculated from the model results of each replication. This was not performed due to the time it takes to do this.

Related, I experienced long run time trying to model the latent interaction with "trans pride" contributing to the relationship between school climate and school belongingness. This is jointly due to the challenge of running a model with ordered categorical variables (WLSMV est.) with multiple imputed data. To solve this issue, I switched to ML estimation to run the final latent interaction model reviewed in this manuscript.

Overall, further re-specification is needed to improve model fit of the non-transgender group latent measurement model before performing further analyses that relate other constructs to this model. A short form version may be needed to accommodate the student body at large, not only the needs of transgender identified students.

All data collected is cross-sectional. A longitudinal design can better accommodate my theoretical approach and central aims to identify protective processes that interact with school climate to predict student wellness. Trans students developing in school spaces is best conceptualized as a reciprocal process, that relies on both people and entities external to the individual, and individual processes. Unlike behavioral approaches to stress that depict individuals as being weighed down by risk factors, systems approaches like this are discontinuous, and allow space for the individual to actively shape their own growth (Sameroff, 2009). However in practice, cross-lagged models designed to capture bi-directional influence within a system, by showing how each person or entity is affected by that of the other (controlling for themselves), are

128

statistically complex, and require multiple time points. Despite the temporal limitation, the current study applies moderation to reveal indirect transactions of school climate on trans adolescent development. In the literature mediation is sometimes used to show indirect relationships from cross-sectional approaches so the influence of multiple predictors can be observed to impact development jointly (Bornstein & Lamb, 2015).

Implications for Practice and Research

Similar to themes that emerged in an ecological-transactional review of the literature on school climate supports for trans youth (Scrofani et al., *Under Review*), scale development results demonstrate that there are a lot of moving pieces at each contextual level contributing to a school climate of gender, and that more are necessary to support the school climate of trans students, than that of non-trans identified students (Wright-Maley et al., 2016). Going forward, thematic coding of short answer questions can help to identify trans specific supports which may be unique to informing school climate for this group, such as 1) supports specific to the coming out process in school spaces, and related, 2) protective factors intended to create a partnership with families. Healthcare providers report that transgender adolescents often express anxiety about school experiences because of significant social challenges presented in this space (Keomeier and Ehrensaft, 2018). Furthermore, trans youth without an intervening therapist who acts to initiate a school partnership with the home, such as to provide an "official stamp of approval" for trans support (Lev & Woulf-Gould, 2018, p. 198 as cited in Keo-Meier & Ehrensaft, 2018), may be further compromised if they are attending a school without

supports in place to support trans (and other gender diverse youth) in the first place (Malpas, Glaeser, & Giammatei, 2018).

Scale development results provide important insight on what school programming efforts can do to improve school climate for all high school students, beyond trans specific supports. Aligned with content that emerged from indicators loading on "Gender Agency" and "Exo and Meso-system Support" of the GASC scale, school climate focused support interventions targeting faculty should focus on teaching school staff how to 1) encourage diverse peer relationships and student trans-sensitivity, 2) to deconstruct social norms such as identify gender stereotyping across school subject domains in curriculums, and 3) to act to help to have structures in place to promote support. Some themes that emerged for staff to create a supportive space included initiating school programming to encourage girls to pursue fields in the math and sciences, (and boys to not be restricted to these domains), to avoid imposing a dress code policy with "cross-gender" restrictions, and to support bathroom policies that allows students to use their preferred bathroom. Also, aligned with content that emerged on these factors, support interventions that target the student community, such as enrichment courses on human development and gender, can be used to engage students to communicate about topics like normalizing gender diversity and gender questioning in school spaces, and expanding the traditional Western conceptualization of gender across school subject domains. In the process, student programming efforts should help to initiate communication between gender diverse and non-gender diverse youth on these topics, and to create an alliance between them. Similar to how Poteat et al. (2017) points out the importance of student group interventions like GSAs to not treat all LGBT students as a homogeneous group,

130

school enrichment interventions on gender identity should not be designed exclusively for LGBT students, or treat content as LGBT exclusive.

Conclusions

Pilot and primary study results for scale development provide evidence to validate assumptions that the proposed Gender Affirmative School Climate (GASC) construct captures what was intended, school climate specific to the domain of gender. However, results suggest that not all of the items operate equivalently across transgender and non-transgender groups. Most notably, items that correspond with factor domains "peer bullying and victimization" and "felt-pressure to gender norms" did not covary as strongly in the non-transgender measurement model. Further research is needed to explore if a short-form version of the scale can be used among all students excluding questions from these domains, and encompassed by indicators on factor 1 ("gender agency") and 3 (exo and meso supports) of the current latent measurement model. At the same time, the 4-factor latent measurement model for the transgender identified sub-sample demonstrated good measurement quality and model fit. While there are school climate scales that focus on race (Byrd, 2017), and the needs of LGBT students at large (Coulter et al., 2015), there have been none validated that focus on the domain of gender.

Overall, results showed that non-transgender identified high school students reported more positive gender affirmative school climate, higher school belonging, and more youth activism compared to transgender identified high school students. These results are in line with previous research that found that transgender middle and high schoolers perceive school climate more negatively and experience higher levels of

bullying, as compared to cisgender students (Pampati et al., 2020; Day, Perez-Brumer & Russell, 2018). However, in the current study transgender students reported higher self-esteem compared non-transgender students. Broadly these results show that transgender students experience more school community strain compared to non-trans identified students, but their self-esteem is not directly dependent on these experiences. It's possible that the negative relationship between school climate and self-esteem is illustrating developmental changes in thinking and maturity where the students that have higher self-esteem have the ability to speak up more about school climate challenges specific to the domain of gender (Way, Reddy & Rhodes, 2007).

Unlike my expectation for the first main effect hypothesis, high school students that reported more positive school climate reported lower self-esteem scores. Only one protective moderator was consistent with my interaction hypotheses. More feelings of similarity to peer group gender (boys) emerged as a protective factor for transgender identified high schoolers attenuating the negative relationship between perceptions of school climate and self-esteem. Yet, less feelings of similarity to boys weakened the negative relationship between school climate and self-esteem among non-transgender identified participants.

Consistent with my expectation for the second main effect hypothesis, high school students that reported more positive school climate also reported higher school belongingness. Latent measurement models for each gender group demonstrated that the school belongingness construct is highly correlated to the proposed gender affirmative school climate (GASC) construct. This demonstrated domain overlap with "feelings of school belongingness" signals that the proposed scale shows good convergent validity

132

because school belongingness constructs show a high correlation with school climate measures among middle and high school students in the literature (Ullman, 2022). Furthermore, the individual level sub-domain composite of the latent factor "agency" showed a strong association with school belongingness for both transgender and non-transgender groups which suggests that when students are given opportunities to feel empowered, pursue their interests without restriction, and be affirmed in their gender identities, their sense of belongingness in the school community grows. Although results showed that the scope of a school climate of gender may be narrower for non-transgender students, both non-trans and trans identified students' sense of school belonging showed to have a strong association with the GASC overall. These results highlight the importance of school professionals' responsibility to initiate a school community and culture that interrogates issues on gender diversity, equity, and inclusion for all high school students. Moreover, that these actions are integral to inform a sense of community and belonging among both gender diverse and cisgender students.

Group level protective factors did not operate as expected in moderation models that regressed school belongingness on school climate among the sample at large, and with each gender group. Results that show that less similarity to peer group girls and non-binary strengthens the association between perceived school climate and school belongingness may have unique implications for the transgender sub-sample which has a large proportion of " binary male" identified students, despite corresponding results among the non-transgender sub-sample.

Further research that applies the sub-scale of "school activism" (YII; Pancer et al., 2007) to each sub-sample's moderation model (non-trans and trans) will help to conclude

if moderation results were biased because of the large discrepancy in youth activism

scores shown between trans and non-transgender students. Going forward, I expect

higher scores for school activism to strengthen the relationship between school climate

and school belonging among non-trans identified students, who scored higher on youth

activism and school activism overall.

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APPENDIX A

TABLES & FIGURES

Table 1.1

Pilot 2 - Participant Demographics (N=758)

Measure	*n*	%
Gender Identity		
Cisgender	117	15.4
Transgender	413	54.3
Genderqueer	139	18.3
Agender	39	5.1
Other	49	6.4
Binary Identity		
Male	275	36.2
Female	135	17.8
Non-binary	299	39.3
Third gender	9	1.2
Other	40	5.3
Sexual Orientation		
Heterosexual	80	10.5
Homosexual	134	17.6
Bisexual	219	28.8
Queer	184	24.2
Asexual	100	13.2
Questioning	33	4.3
Prefer not to say	8	1.1
Race		
White	572	75.3
Black or African American	52	6.8
American Indian or Alaska Native	9	1.2
Asian	20	2.6
Native Hawaiian or Pacific Islander	2	.3
Two or more races	86	11.3
Unknown	13	1.7
Ethnicity		
Hispanic, Latino, and/or Spanish	107	14.1
Non-Hispanic, Latino, and/or Spanish	608	80.0
Unknown	36	4.7
Grade		
9th	35	4.6
10th	202	26.6
11th	255	33.6
12th	237	31.2
Other	28	3.7
School Community		
Rural	95	12.5
Suburban	438	57.6
Urban	225	29.6

Table 1.

Primary Study - Participant Demographics (N=813)

Measure	n	%
Gender Identity		
Cisgender	105	12.9
Transgender	482	59.3
Genderqueer	99	12.2
Agender	52	6.4
Other	72	8.9
Binary Identity		
Male	383	47.1
Female	106	13.0
Non-binary	250	30.8
Third gender	7	0.9
Other	67	8.2
Sexual Orientation		
Heterosexual	86	10.6
Homosexual	165	20.3
Bisexual	209	25.7
Queer	196	24.1
Asexual	105	12.9
Questioning	38	4.7
Prefer not to say	13	1.6
Race		
White	627	77.1
Black or African American	33	4.1
American Indian or Alaska Native	14	1.7
Asian	33	4.1
Native Hawaiian or Pacific Islander	1	0.1
Two or more races	88	10.8
Unknown	16	2.0
Ethnicity		
Hispanic, Latino, and/or Spanish	157	19.3
Non-Hispanic, Latino, and/or Spanish	595	73.2
Unknown	49	6.0
Grade		
9th	67	8.2
10th	277	34.1
11th	230	28.3
12th	238	29.3
Other	1	0.1
School Community		
Rural	112	13.8
Suburban	448	55.1
Urban	249	30.6

Table 2.1

Means, Medians, and SDs for proposed GASC items – Pilot 2

Item	Question	M	SD	mode	min	max
Q20	When I'm at school I'm free to live in the gender that feels most…	4.43	1.82	5	1	7
Q21	At my school students are free to take the lead in expressing…	4.70	1.74	6	1	7
Q22	At my school questioning your gender is considered normal.	3.61	1.89	2	1	7
Q23	Overall, my school does not restrict, but helps to support my…	4.35	1.75	6	1	7
Q24	At my school students of all gender identities feel listened to…	3.62	1.90	2	1	7
Q25	When I'm at school I feel more pressure to conform to traditional…	4.52	1.83	6	1	7
Q26	At my school students of different gender identities blend…	4.24	1.83	6	1	7
Q27	My gender identity does not negatively impact my inclusion…	4.17	1.92	6	1	7
Q28	My peers are willing to intervene (to help), when witnessing…	4.02	1.84	5	1	7
Q29	I have friends at school who I freely talk to about topics that…	5.46	1.65	7	1	7
Q30	My peers at school befriend students of all gender identities…	4.51	1.76	6	1	7
Q31	I find it hard to make close friends at school because of my…	3.59	1.88	2	1	7
Q32	Among peers at school I have witnessed comments or behaviors…	5.70	1.47	7	1	7
Q33	Peers at school have commented or behaved in ways that convey…	5.13	1.73	6	1	7
Q34	Selfish-ness and lack of concern for others, are socially…	5.09	1.51	6	1	7
Q35	I feel pressure to maintain traditional gender norms when…	4.36	1.82	5	1	7
Q36	I feel pressure from my peers at school to engage in stereotypical…	4.36	1.80	5	1	7
Q37	Among peers at school I have witnessed the spreading of…	4.63	1.87	6	1	7
Q38	A peer has spread rumors or ignored me because of my gender…	3.66	1.98	2	1	7
Q39	Among peers at my school I have witnessed gendered "name…	4.84	1.90	6	1	7
Q40	I have been the victim of gendered "name calling" that is…	3.87	2.08	2	1	7
Q41	Among peers at my school I have witnessed threats to physically…	3.59	2.03	2	1	7
Q42	A peer has threatened to physically hurt me because of my…	2.82	1.87	1	1	7
Q43	Teachers and other staff at school support me in my gender…	4.91	1.52	5	1	7
Q44	My gender identity impacts the extent to which teachers/and…	3.57	1.84	2	1	7
Q45	My teachers and other staff are willing to intervene (to help)…	4.45	1.68	5	1	7
Q46	Teachers and other staff freely talk about topics that expand…	3.96	1.85	5	1	7
Q47	Teachers and other staff at my school don't give preferential…	4.43	1.68	4	1	7
Q48	I find it hard to have close relationships with teachers and…	3.71	1.89	2	1	7

| Q49 | Teachers and other staff have a collective sense of responsibility… | 4.61 | 1.74 | 6 | 1 | 7 |

Table 2.1

Means, Medians, and SDs for proposed GASC items – Pilot 2 (continued)

Item	Question	M	SD	mode	min	max
Q50	I feel comfortable reporting gender-related bullying or harassment…	3.97	1.93	6	1	7
Q51	At my school, gender identity impacts how severely a student…	4.00	1.80	4	1	7
Q52	Teachers at my school take initiative to teach students about…	3.30	1.97	1	1	7
Q53	I feel pressure to maintain traditional gender norms when I'm…	4.24	1.86	5	1	7
Q54	I feel pressure from teachers and other professionals at school…	3.99	1.83	5	1	7
Q55	Teachers and other professionals at my school focus on…	3.86	1.79	4	1	7
Q56	My school runs community or after school events which focus on…	3.64	1.97	1	1	7
Q57	My school runs community or after school events which focus on…	3.62	1.98	1	1	7
Q58	The actions of families in the greater community, such as…	3.17	1.79	1	1	7
Q59	My school provides trans and other gender diverse students equal…	4.36	1.85	6	1	7
Q60	My school sends out at least one notice to parents (including…	2.68	1.82	1	1	7
Q61	My school has a sense of a vision, or mission that focuses on…	3.20	1.90	1	1	7
Q62	Regardless of the visibility of transgender and other gender…	3.94	1.92	5	1	7
Q63	My school has a sense of a vision, or a mission that focuses on…	3.86	1.82	4	1	7
Q64	My school is proactive to initiate a culture in which all students…	3.93	1.90	5	1	7
Q65	The curriculum at my school challenges gender privilege through…	3.49	1.86	2	1	7
Q66	The curriculum at my school challenges traditional gender…	3.53	1.82	2	1	7
Q67	My school curriculum is inclusive and sensitive to current social…	3.65	1.89	1	1	7
Q68	I have learned about transgender and other gender diverse role…	2.99	1.96	1	1	7
Q69	The curriculum on adolescent health and development at my…	3.46	2.03	1	1	7
Q70	The curriculum on adolescent health and development at my…	3.36	1.90	1	1	7
Q71	The curriculum at my school teaches about biology and…	3.16	1.88	1	1	7
Q72	My school has a space for transgender and other gender diverse…	3.35	1.88	1	1	7
Q73	My school has a social support group/s designed to create…	5.07	1.88	6	1	7
Q74	Student athletes are given preferential treatment because of their…	4.21	1.70	4	1	7
Q75	Role models in the community whose gender falls outside of…	2.96	1.87	1	1	7

Q76	Gender identity and/or gender expression does not prevent any…	5.14	1.75	6	1	7
Q77	My school permits transgender and other gender diverse students…	4.42	1.77	4	1	7
Q78	Students at my school are allowed to use bathrooms and locker…	4.06	1.94	6	1	7
Q79	My schools code of conduct guidelines for dress code do not…	4.86	1.77	6	1	7
Q80	School media such as posters on walls or newsletters (online or…	3.76	1.87	4	1	7
Q81	School media such as posters on walls and newsletters (online or…	4.36	1.83	6	1	7
Q82	If structures and spaces do not fit the needs of transgender and other…	3.58	1.88	1	1	7

Note: 1) Highlighted items were dropped after EFA procedure.
2) Item 28 dropped, then retained in for primary data collection.
3) Indicate which items were reverse coded by writing - reverse

150

Table 2.2

Means, Medians, and SDs for proposed GASC items – Primary Study

Item	Question	M	SD	mode	min	max
Q20	When I'm at school I'm free to live in the gender that feels most…	4.34	1.88	5	1	7
Q21	At my school students are free to take the lead in expressing their…	4.71	1.82	6	1	7
Q22	At my school questioning your gender is considered normal.	3.55	1.85	2	1	7
Q23	Overall, my school does not restrict, but helps to support my gender...	4.17	1.74	5	1	7
Q24	At my school students of all gender identities feel listened to…	3.43	1.84	1	1	7
Q25	When I'm at school I feel more pressure to conform to traditional…	3.23	1.79	2	1	7
Q26	At my school students of different gender identities blend, interrelate…	4.12	1.82	5	1	7
Q27	My gender identity does not negatively impact my inclusion in peer…	NA	NA	NA	NA	NA
Q28	My peers are willing to intervene (to help), when witnessing gender-…	3.90	1.94	5	1	7
Q29	I have friends at school who I freely talk to about topics that expand…	5.72	1.44	7	1	7
Q30	My peers at school befriend students of all gender identities.	NA	NA	NA	NA	NA
Q31	I find it hard to make close friends at school because of my gender...	NA	NA	NA	NA	NA
Q32	Among peers at school I have witnessed comments or behaviors that…	1.99	1.28	1	1	7
Q33	Peers at school have commented or behaved in ways that convey…	2.34	1.48	1	1	7
Q34	Selfish-ness and lack of concern for others, are socially destructive…	NA	NA	NA	NA	NA
Q35	I feel pressure to maintain traditional gender norms when I'm with…	3.27	1.71	3	1	7
Q36	I feel pressure from my peers at school to engage in stereotypical…	3.30	1.75	3	1	7
Q37	Among peers at school I have witnessed the spreading of rumors or…	3.21	1.84	2	1	7

Item	Question	M	SD	mode	min	max
Q38	A peer has spread rumors or ignored me because of my gender…	4.07	1.95	6	1	7
Q39	Among peers at my school I have witnessed gendered "name…	2.96	1.81	2	1	7
Q40	I have been the victim of gendered "name calling" that is…	3.87	2.08	6	1	7
Q41	Among peers at my school I have witnessed threats to physically…	4.32	2.01	6	1	7
Q42	A peer has threatened to physically hurt me because of my gender…	5.06	1.89	6	1	7
Q43	Teachers and other staff at school support me in my gender identity…	4.95	1.45	5	1	7
Q44	My gender identity impacts the extent to which teachers/and other…	NA	NA	NA	NA	NA
Q45	My teachers and other staff are willing to intervene (to help), when…	4.27	1.67	5	1	7
Q46	Teachers and other staff freely talk about topics that expand the…	3.70	1.89	5	1	7
Q47	Teachers and other staff at my school don't give preferential…	NA	NA	NA	NA	NA
Q48	I find it hard to have close relationships with teachers and other…	NA	NA	NA	NA	NA
Q49	Teachers and other staff have a collective sense of responsibility…	4.21	1.77	5	1	7

Table 2.2

Means, Medians, and SDs for proposed GASC items – Primary Study (continued)

Item	Question	M	SD	mode	min	max
Q50	I feel comfortable reporting gender-related bullying or…	3.82	2.01	2	1	7
Q51	At my school, gender identity impacts how severely a student…	NA	NA	NA	NA	NA
Q52	Teachers at my school take initiative to teach students about…	3.13	1.90	1	1	7
Q53	I feel pressure to maintain traditional gender norms when…	3.45	1.75	3	1	7
Q54	I feel pressure from teachers and other professionals at…	3.77	1.80	3	1	7
Q55	Teachers and other professionals at my school focus on…	NA	NA	NA	NA	NA
Q56	My school runs community or after school events which…	3.58	2.03	1	1	7
Q57	My school runs community or after school events which…	3.55	2.07	1	1	7
Q58	The actions of families in the greater community, such as…	3.13	1.81	1	1	7
Q59	My school provides trans and other gender diverse students…	4.22	1.92	6	1	7
Q60	My school sends out at least one notice to parents (including…	2.49	1.72	1	1	7
Q61	My school has a sense of a vision, or mission that focuses on…	3.01	1.82	1	1	7
Q62	Regardless of the visibility of transgender and other gender…	3.79	1.83	5	1	7
Q63	My school has a sense of a vision, or a mission that focuses on…	3.82	1.83	4	1	7
Q64	My school is proactive to initiate a culture in which all students…	3.80	1.79	5	1	7

Q65	The curriculum at my school challenges gender privilege through…	3.71	1.84	4	1	7
Q66	The curriculum at my school challenges traditional gender…	3.54	1.83	1	1	7
Q67	My school curriculum is inclusive and sensitive to current social…	3.60	1.84	5	1	7
Q68	I have learned about transgender and other gender diverse role…	2.90	1.89	1	1	7
Q69	The curriculum on adolescent health and development at my…	3.18	1.97	1	1	7
Q70	The curriculum on adolescent health and development at my…	3.22	1.89	1	1	7
Q71	The curriculum at my school teaches about biology and human…	3.12	1.89	1	1	7
Q72	My school has a space for transgender and other gender diverse…	3.04	1.83	1	1	7
Q73	My school has a social support group/s designed to create an…	4.97	1.98	6	1	7
Q74	Student athletes are given preferential treatment because of their…	NA	NA	NA	NA	NA
Q75	Role models in the community whose gender falls outside of the…	2.80	1.85	1	1	7
Q76	Gender identity and/or gender expression does not prevent any…	5.42	1.57	6	1	7
Q77	My school permits transgender and other gender diverse students…	4.32	1.86	4	1	7
Q78	Students at my school are allowed to use bathrooms and locker…	3.81	1.97	1	1	7
Q79	My schools code of conduct guidelines for dress code do not…	4.94	1.78	6	1	7
Q80	School media such as posters on walls or newsletters (online or…	3.67	1.89	5	1	7
Q81	School media such as posters on walls and newsletters (online or…	4.22	1.86	5	1	7
Q82	If structures and spaces do not fit the needs of transgender and…	3.45	1.81	1	1	7

Note: 1) reverse coded items are labeled reverse

Figure 3.0
Pilot 2 - Scree plot (ML estimation; Quartimax; Oblique)
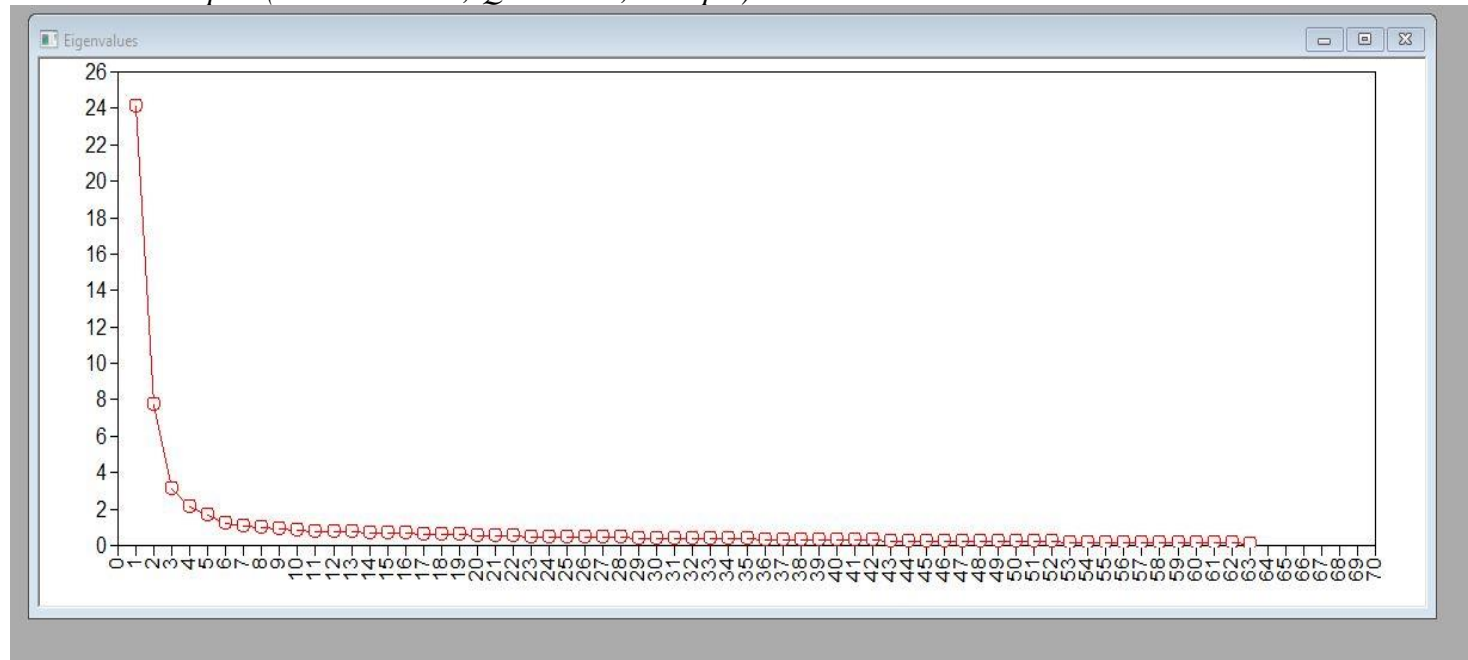
Table 3.0
Model Fit Statistics – Pilot 2 – EFA, ESEMs, & CFA

Estimation/Rotation	χ^2	*df*	χ^2/df	CFI	TLI	RMSEA [90% CI]	Stand. RMR
ML/Quartimax	4707.06*	1707	2.757	.860	.839	.048 [.047, .050]	.037
WLSMV/Quartimax							
WLSMV/CF-Varimax	6754.735*	1707	3.971	.907	.893	.062 [N/A, N/A]	.039
WLSMV/CF-Varimax (w/ dropped)	5573.44*	1124	4.959	.921	.896	.072 [N/A, N/A]	.038
WLSMV - CFA	8487.586	1319	6.435	.860	.853	.085 [N/A.,N/A]	.074

Note: All rotations Oblique

Table 4.0
Pilot 2 – Correlation matrix of inter-factor correlations – ESEM – CF- Varimax – WLSMV

Factors	1	2	3	4
Factor 1: "Agency/ Phenomenology of gender"	-			
Factor 2: "Peer bullying/victim"	-.156**	-		
Factor 3: "Exo-system support"	.592**	-.453**	-	
Factor 4: "Felt pressure to gender norms"	-.144**	.557**	-.565**	-

Note: *1) ESEM after items dropped*
      2) N =758

Table 5.0
Pilot 2 – CF- Varimax Rotation – WLSMV estimation – 11 dropped items

(RMSEA=.072; CFI =.912; SRMR=.038)				
Standardized Factor Loadings for ESEM (EFA) of proposed GASC Scale				
	A	P	EXO	F-P
20.) When I'm at school I'm free to live in the gender that feels most real and comfortable.	.489			
21.) At my school students are free to take the lead in expressing their gender, apart from what may be expected of you from traditional norms.	.585			
22.) At my school questioning your gender is considered normal.	.432			
23.) Overall, my school does not restrict, but helps to support my gender identity.	.608			
24.) At my school students of all gender identities feel listened to, represented, and that they have a voice.	.419			
25.) When I'm at school I feel more pressure to conform to traditional gender norms than usual.				.634
26.) At my school students of different gender identities (i.e. including cisgender, transgender, non-binary identified, etc.) blend, interrelate, and feel like valid members of the community.	.497			
27.) My gender identity does not negatively impact my inclusion in peer groups at school.				
28.) My peers are willing to intervene (to help), when witnessing gender-related and transphobic harassment.				
29.) I have friends at school who I freely talk to about topics that expand the traditional concept of gender, such as gender diversity (for example advocating for non-binary and trans identities) and gender equity (for example, challenging gender roles in the math and sciences or speaking up for school gun violence).	.557			
30.) My peers at school (including classmates, sports team members, peers from lunch and recess, etc.) befriend students of all gender identities.				
31.) I find it hard to make close friends at school because of my gender identity.				
32.) Among peers at school I have witnessed comments or behaviors that convey insensitivity, or invalidate the thoughts, feelings, or reality of marginalized gender identities (including cisgender and gender diverse).		.560		
33.) Peers at school have commented or behaved in ways that convey insensitivity, or invalidate my thoughts, feelings, or		.609		

155

reality because of my gender identity (cisgender female, transgender, non-binary identified, etc.).			
34.) Selfish-ness and lack of concern for others, are socially destructive within peer groups at my school.			
35.) I feel pressure to maintain traditional gender norms when I'm with peers at school.			.758
36.) I feel pressure from my peers at school to engage in stereotypical male or female behavior.			.664
37.) Among peers at school I have witnessed the spreading of rumors or someone being ignored, because of their gender identity (cisgender, transgender, non-binary identified, etc.) or gender expression (i.e. may include clothing, make-up, mannerisms, hair style, etc).	.678		
38.) A peer has spread rumors or ignored me because of my gender identity (cisgender, transgender, non-binary identified, etc.) or gender expression (i.e may include clothing, make-up, mannerisms, hair style, etc.).	.711		
39.) Among peers at my school I have witnessed gendered "name calling" that is derogatory because of a someone's gender identity or gender expression.	.740		
40.) I have been the victim of gendered "name calling" that is derogatory because of my gender identity or gender expression.	.783		
41.) Among peers at my school I have witnessed threats to physically hurt someone because of their gender identity or gender expression.	.760		
42.) A peer has threatened to physically hurt me because of my gender identity or expression.	.763		
43.) Teachers and other staff at school support me in my gender identity (cisgender, transgender, non-binary identified, etc.).	.694		
44.) My gender identity (i.e. cisgender, transgender, non-binary identified, etc.) impacts the extent to which teachers/and other staff include me in activities and call on me to participate.			
45.) My teachers and other staff are willing to intervene (to help), when witnessing gender-related and transphobic harassment.	.544		
46.) Teachers and other staff freely talk about topics that expand the traditional concept of gender, such as diversity (i.e. gender diverse identities) and equity (i.e. challenging the idea that males belong math and science fields)	.411		
47.) Teachers and other staff at my school don't give preferential treatment to students because of their gender identity (i.e. cisgender, transgender, non-binary identified,			

etc.) and/or gender expression (i.e. may include clothing, make-up, mannerisms, hair style, etc.).				
48.) I find it hard to have close relationships with teachers and other staff at my school because of my gender identity.				
49.) Teachers and other staff have a collective sense of responsibility in creating a space for students of all genders (i.e. cisgender, transgender, and non-binary identified, etc.) to learn and thrive.	.470			
50.) I feel comfortable reporting gender-related bullying or harassment to teachers and other staff without fear that their own gender biases or opinions would prevent the issue from being heard, or taken seriously.	.457			
51.) At my school, gender identity (cisgender, transgender and non-binary identified) impacts how severely a student is perceived when breaking school guidelines.				
52.) Teachers at my school take initiative to teach students about proper pronoun usage related to gender identities.			.590	
53.) I feel pressure to maintain traditional gender norms when I'm with teachers and other professionals at school.				.865
54.) I feel pressure from teachers and other professionals at school to engage in stereotypical male or female behavior.				.802
55.) Teachers and other professionals at my school focus on discouraging the organization of students by gender in and out of the classroom (such as: single-sex classes, separating gym classes by gender, teacher seating arrangement by gender, etc.).				
56.) My school runs community or after school events which focus on educating about gender equity (i.e. reproductive rights for women, resistance of toxic masculinities such as school gun violence, challenging gender roles in the math and sciences), and are designed to connect students with an extended social network, including their families.	.480			
57.) My school runs community or after school events which focus on educating about gender diversity (i.e. may include rights for transgender and non-binary identies), and are designed to connect students with an extended social network, including their families.			.463	
58.) The actions of families in the greater community, such as involvement in political activism or fundraising, has helped my school's commitment to advocating for gender equity (i.e. such as reproductive rights for women, resistance of toxic masculinities such as school gun violence, and challenging gender roles in math and sciences).			.556	
59.) My school provides trans and other gender diverse students equal access to educational programs and activities,	.539			

even in circumstances in which parents raise objections or concerns.			
60.) My school sends out at least one notice to parents (including e-mails, letters, bulletins, online newsletters, etc.) informing them of the rights of transgender and other gender diverse identities in school spaces.		.822	
61.) My school has a sense of a vision, or mission that focuses on expanding the understanding of gender.		.725	
62.) Regardless of the visibility of transgender and other gender diverse students, my school is pro-active in creating a safe space for transgender and gender diverse students.	.541		
63.) My school has a sense of a vision, or a mission that focuses on creating a social discourse where gender hierarchies are not maintained, such as working against the notion that the values aligned with a westernized ideal of masculinity should be dominant.		.450	
64.) My school is proactive to initiate a culture in which all students (i.e. cisgender, transgender, non-binary identified, etc.) have the ability to live in the gender that feels most real and comfortable to them, and to express that gender with freedom from restriction and rejection.	.467		
65.) The curriculum at my school challenges gender privilege through expansive curricula (within and across subject domains such as history and science) and approaches to teaching, such as by educating on why the belief that men belong in the math and sciences came to exist.		.462	.456
66.) The curriculum at my school challenges traditional gender stereotypes through expansive curricula (within and across subject domains such as history and science) and approaches to teaching, by covering why gender stereotypes exist, and deconstructing their connection to social norms.		.466	.423
67.) My school curriculum is inclusive and sensitive to current social issues centering around gender diversity, such as advocating for the rights of transgender youth.		.595	
68.) I have learned about transgender and other gender diverse role models at my school.		.709	
69.) The curriculum on adolescent health and development at my school explains the difference between biological sex and gender identity.		.778	
70.) The curriculum on adolescent health and development at my school is inclusive to the identities and experiences gender diverse youth.		.802	
71.) The curriculum at my school teaches about biology and human bodies in ways that does not reinforce a traditional gender binary, such as including education on intersex people.		.665	

72.) My school has a space for transgender and other gender diverse athletes, on mixed gender sport leagues and/or by allowing transgender athletes to participate on single sex sports teams based on their gender identity, rather than birth sex.			.548	
73.) My school has a social support group/s designed to create an alliance between cisgender and students in the great LGBTQIA+ community, such as a Gay Straight Alliance (GSA).	.638			
74.) Student athletes are given preferential treatment because of their gender expression or presentation (i.e. may include make-up, clothing, mannerisms, etc.).				
75.) Role models in the community whose gender falls outside of the traditional binary have been invited to speak at my school.			.784	
76.) Gender identity and/or gender expression does not prevent any student from attending a school dance with another student, such as the prom.	.682			
77.) My school permits transgender and other gender diverse students to participate in gender-segregated school activities in accordance with the student's gender identity (For example, think about the school choir, pep rally activities, prom king/queen contest, etc.).	.538			
78.) Students at my school are allowed to use bathrooms and locker rooms coinciding with their gender identity, rather than birth sex.	.485			
79.) My schools code of conduct guidelines for dress code do not prevent students from wearing clothing or accessories because of their gender identity and/or gender expression.	.613			
80.) School media such as posters on walls or newsletters (online or paper) include messages, symbols, or images which promote gender equity (i.e. such as reproductive rights for women, resistance of toxic masculinities such as school gun violence, challenging gender roles in academic subject domains and career paths).	.480			
81.) School media such as posters on walls and newsletters (online or paper) include messages, symbols, or images which promote gender inclusion (i.e. such as advocating for girls to pursue careers in the math and sciences and using gender inclusive language).	.540			
82.) If structures and spaces do not fit the needs of transgender and other gender diverse students, my school is pro-active to make alternative arrangements for these students.			.465	

Table 6.0
Pilot and Primary Studies - CFA - WLSMV estimation

Standardized Factor Loadings for CFA of proposed GASC Scale	*Pilot*		*Primary*	
(Overall scale - Primary study α = **.963)**	λ	**SE**	λ	**SE**
F1 Gender Agency (Primary study α = **.945)**				
a.) Individual level support				
20.) When I'm at school I'm free to live in the gender that feels most real and comfortable.	.702	.021	.719	.019
21.) At my school students are free to take the lead in expressing their gender, apart from what may be expected of you from traditional norms.	.730	.018	.720	.018
22.) At my school questioning your gender is considered normal.	.778	.016	.741	.018
23.) Overall, my school does not restrict, but helps to support my gender identity.	.793	.015	.780	.015
24.) At my school students of all gender identities feel listened to, represented, and that they have a voice.	.840	.013	.789	.016
b.) Microsystem support				
26.) At my school students of different gender identities (i.e. including cisgender, transgender, non-binary identified, etc.) blend, interrelate, and feel like valid members of the community.	.792	.015	.766	.016
28.) My peers are willing to intervene (to help), when witnessing gender-related and transphobic harassment.	.640	.022	.639	.023
43.) Teachers and other staff at school support me in my gender identity (cisgender, transgender, non-binary identified, etc.).	.611	.024	.622	.023
45.) My teachers and other staff are willing to intervene (to help), when witnessing gender-related and transphobic harassment.	.689	.021	.672	.021
46.) Teachers and other staff freely talk about topics that expand the traditional concept of gender, such as diversity (i.e. gender diverse identities) and equity (i.e. challenging the idea that males belong math and science fields)	.708	.021	.752	.018
49.) Teachers and other staff have a collective sense of responsibility in creating a space for students of all genders (i.e. cisgender, transgender, and non-binary identified, etc.) to learn and thrive.	.565	.027	.761	.018
50.) I feel comfortable reporting gender-related bullying or harassment to teachers and other staff without fear that	.694	.021	.762	.016

their own gender biases or opinions would prevent the issue from being heard, or taken seriously.				
c.) Structures and Spaces support				
59.) My school provides trans and other gender diverse students equal access to educational programs and activities, even in circumstances in which parents raise objections or concerns.	.718	.019	.687	.020
62.) Regardless of the visibility of transgender and other gender diverse students, my school is pro-active in creating a safe space for transgender and gender diverse students.	.861	.013	.840	.013
64.) My school is proactive to initiate a culture in which all students (i.e. cisgender, transgender, non-binary identified, etc.) have the ability to live in the gender that feels most real and comfortable to them, and to express that gender with freedom from restriction and rejection.	.864	.012	.857	.013
77.) My school permits transgender and other gender diverse students to participate in gender-segregated school activities in accordance with the student's gender identity (For example, think about the school choir, pep rally activities, prom king/queen contest, etc.).	.601	.027	.565	.028
78.) Students at my school are allowed to use bathrooms and locker rooms coinciding with their gender identity, rather than birth sex.	.686	.027	.657	.022
79.) My schools code of conduct guidelines for dress code do not prevent students from wearing clothing or accessories because of their gender identity and/or gender expression.	.493	.031	.473	.031
80.) School media such as posters on walls or newsletters (online or paper) include messages, symbols, or images which promote gender equity (i.e. such as reproductive rights for women, resistance of toxic masculinities such as school gun violence, challenging gender roles in academic subject domains and career paths).	.760	.018	.777	.017
81.) School media such as posters on walls and newsletters (online or paper) include messages, symbols, or images which promote gender inclusion (i.e. such as advocating for girls to pursue careers in the math and sciences and using gender inclusive language).	.667	.024	.686	.022
F2 Peer Bullying (Primary study α = .870)				
32.) Among peers at school I have witnessed comments or behaviors that convey insensitivity, or invalidate the thoughts, feelings, or reality of marginalized gender identities (including cisgender and gender diverse).	.852	.024	.802	.029

33.) Peers at school have commented or behaved in ways that convey insensitivity, or invalidate my thoughts, feelings, or reality because of my gender identity (cisgender female, transgender, non-binary identified, etc.).	.763	.021	.858	.023
37.) Among peers at school I have witnessed the spreading of rumors or someone being ignored, because of their gender identity (cisgender, transgender, non-binary identified, etc.) or gender expression (i.e. may include clothing, make-up, mannerisms, hair style, etc).	.815	.019	.789	.021
38.) A peer has spread rumors or ignored me because of my gender identity (cisgender, transgender, non-binary identified, etc.) or gender expression (i.e may include clothing, make-up, mannerisms, hair style, etc.).	.702	.022	.687	.023
39.) Among peers at my school I have witnessed gendered "name calling" that is derogatory because of a someone's gender identity or gender expression.	.819	.017	.790	.021
40.) I have been the victim of gendered "name calling" that is derogatory because of my gender identity or gender expression.	.746	.020	.716	.022
41.) Among peers at my school I have witnessed threats to physically hurt someone because of their gender identity or gender expression.	.745	.020	.728	.021
42.) A peer has threatened to physically hurt me because of my gender identity or expression.	.621	.026	.628	.025
F3 Exo- and Meso- support (Primary study α = **.947**)				
a.) Curriculum				
52.) Teachers at my school take initiative to teach students about proper pronoun usage related to gender identities.	.782	.018	.770	.019
61.) My school has a sense of a vision, or mission that focuses on expanding the understanding of gender.	.865	.012	.845	.013
63.) My school has a sense of a vision, or a mission that focuses on creating a social discourse where gender hierarchies are not maintained, such as working against the notion that the values aligned with a westernized ideal of masculinity should be dominant.	.768	.019	.729	.020
65.) The curriculum at my school challenges gender privilege through expansive curricula (within and across subject domains such as history and science) and approaches to teaching, such as by educating on why the belief that men belong in the math and sciences came to exist.	.552	.029	.699	.021

66.) The curriculum at my school challenges traditional gender stereotypes through expansive curricula (within and across subject domains such as history and science) and approaches to teaching, by covering why gender stereotypes exist, and deconstructing their connection to social norms.	.561	.028	.738	.019
67.) My school curriculum is inclusive and sensitive to current social issues centering around gender diversity, such as advocating for the rights of transgender youth.	.829	.015	.862	.012
68.) I have learned about transgender and other gender diverse role models at my school.	.792	.017	.809	.015
69.) The curriculum on adolescent health and development at my school explains the difference between biological sex and gender identity.	.826	.016	.811	.016
70.) The curriculum on adolescent health and development at my school is inclusive to the identities and experiences gender diverse youth.	.861	.014	.839	.014
71.) The curriculum at my school teaches about biology and human bodies in ways that does not reinforce a traditional gender binary, such as including education on intersex people.	.770	.018	.754	.018
75.) Role models in the community whose gender falls outside of the traditional binary have been invited to speak at my school.	.784	.018	.774	.019
b.) Meso-system support (School-Home)				
56.) My school runs community or after school events which focus on educating about gender equity (i.e. reproductive rights for women, resistance of toxic masculinities such as school gun violence, challenging gender roles in the math and sciences), and are designed to connect students with an extended social network, including their families. (Moved from factor 1 in pilot study)	.713	.022	.710	.020
57.) My school runs community or after school events which focus on educating about gender diversity (i.e. may include rights for transgender and non-binary identies), and are designed to connect students with an extended social network, including their families.	.721	.021	.724	.020
58.) The actions of families in the greater community, such as involvement in political activism or fundraising, has helped my school's commitment to advocating for gender equity (i.e. such as reproductive rights for women, resistance of toxic masculinities such as school gun violence, and challenging gender roles in math and sciences).	.767	.018	.798	.015

60.) My school sends out at least one notice to parents (including e-mails, letters, bulletins, online newsletters, etc.) informing them of the rights of transgender and other gender diverse identities in school spaces.	.765	.019	.822	.016
c.) Extracurriculars				
72.) My school has a space for transgender and other gender diverse athletes, on mixed gender sport leagues and/or by allowing transgender athletes to participate on single sex sports teams based on their gender identity, rather than birth sex.	.788	.018	.763	.020
73.) My school has a social support group/s designed to create an alliance between cisgender and students in the great LGBTQIA+ community, such as a Gay Straight Alliance (GSA). (Moved from factor 1 in the pilot study)	.537	.030	.452	.032
82.) If structures and spaces do not fit the needs of transgender and other gender diverse students, my school is pro-active to make alternative arrangements for these students.	.820	.016	.782	.017
F4 Felt-pressure to gender norms (Primary study α = **.885**)				
25.) When I'm at school I feel more pressure to conform to traditional gender norms than usual.	.829	.021	.804	.021
35.) I feel pressure to maintain traditional gender norms when I'm with peers at school.	.823	.019	.827	.016
36.) I feel pressure from my peers at school to engage in stereotypical male or female behavior.	.795	.022	.809	.018
53.) I feel pressure to maintain traditional gender norms when I'm with teachers and other professionals at school.	.833	.018	.818	.017
54.) I feel pressure from teachers and other professionals at school to engage in stereotypical male or female behavior.	.770	.020	.822	.018
Dropped Items				
27.) My gender identity does not negatively impact my inclusion in peer groups at school.				
29.) I have friends at school who I freely talk to about topics that expand the traditional concept of gender, such as gender diversity (for example advocating for non-binary and trans identities) and gender equity (for example, challenging gender roles in the math and sciences or speaking up for school gun violence). (Factor 1)	.266	.035		
30.) My peers at school (including classmates, sports team members, peers from lunch and recess, etc.) befriend students of all gender identities.				

31.) I find it hard to make close friends at school because of my gender identity.				
34.) Selfish-ness and lack of concern for others, are socially destructive within peer groups at my school.				
44.) My gender identity (i.e. cisgender, transgender, non-binary identified, etc.) impacts the extent to which teachers/and other staff include me in activities and call on me to participate.				
47.) Teachers and other staff at my school don't give preferential treatment to students because of their gender identity (i.e. cisgender, transgender, non-binary identified, etc.) and/or gender expression (i.e. may include clothing, make-up, mannerisms, hair style, etc.).				
48.) I find it hard to have close relationships with teachers and other staff at my school because of my gender identity.				
51.) At my school, gender identity (cisgender, transgender and non-binary identified) impacts how severely a student is perceived when breaking school guidelines.				
55.) Teachers and other professionals at my school focus on discouraging the organization of students by gender in and out of the classroom (such as: single-sex classes, separating gym classes by gender, teacher seating arrangement by gender, etc.).				
74.) Student athletes are given preferential treatment because of their gender expression or presentation (i.e. may include make-up, clothing, mannerisms, etc.).				
76.) Gender identity and/or gender expression does not prevent any student from attending a school dance with another student, such as the prom.	.536	.029		

Table 7.0
Model Fit Statistics –Primary Study - CFAs of proposed GASC Scale

Data file	χ^2	df	χ^2/df	CFI	TLI	RMSEA [90% CI]	Stand. RMR
CFA – Model 1	8357.632	1319	6.336	.855	.849	.083	.066
CFA - Model 2	8197.523	1268	6.465	.856	.850	.084	.066
CFA – Model 3	7930.780	1218	6.511	.860	.853	.084	.065
CFA – Model 4*	7598.190	1218	6.238	.867	.860	.082	.064
CFA – Model 5*	7638.870	1218	6.272	.866	.860	.082	.064
CFA – Model 6**	7433.841	1213	6.128	.872	.865	.081	.062

Item 56 moved to factor 3
**Item 73 moved to factor 3*

165

**Re-specified residual covariances

Table 8.1
Correlation matrix of inter-factor correlations – Primary Study – N =779

Factors	1	2	3	4
Factor 1: "Agency/ Phenomenology of gender"	-			
Factor 2: "Peer bullying/victim"	-.398**	-		
Factor 3: "Exo-system support"	.872**	-.304**	-	
Factor 4: "Felt pressure to gender norms"	-.451**	.618**	-.275**	-

Table 8.2
Correlation matrix of inter-factor correlations – Baseline Model 1- Non-transgender

Factors	1	2	3	4
Factor 1: "Agency/ Phenomenology of gender"	-			
Factor 2: "Peer bullying/victim"	.015**	-		
Factor 3: "Exo-system support"	.925**	-.096**	-	
Factor 4: "Felt pressure to gender norms"	.183**	.625**	.025**	-

Table 8.3
Correlation matrix of inter-factor correlations – Baseline Model 1- Transgender

Factors	1	2	3	4
Factor 1: "Agency/ Phenomenology of gender"	-			
Factor 2: "Peer bullying/victim"	.608**	-		
Factor 3: "Exo-system support"	.860**	.557**	-	
Factor 4: "Felt pressure to gender norms"	.689**	.641**	.566**	-

Table 9.0
Measurement Invariance by Gender - Multi-Group CFA

Model	χ^2	CFI	TLI	RMSEA	SRMR
Model (Comparing non-trans vs. transgender)					
Configural model (unrestrained)	6871.069	.913	.	.066	.065
Measurement model 1 (factor loadings)	6859.694	.914	.	.065	.066
ΔCFI = .001					
$\Delta\chi^2$ = -11.375					
Measurement model 2 (item thresholds)	7583.263	.899	.	.070	.065
ΔCFI = -.015					
$\Delta\chi^2$ = 723.569					
Structural model 3 (factor variances)	7275.269	.905	.	.068	.066
ΔCFI = .006					
$\Delta\chi^2$ = -307.994					
Structural model 4 (latent means)	6796.192	.915	.	.064	.066

ΔCFI = .010

$\Delta\chi2$ = -479.077

Note. Configural model = no equality constraints imposed. Measurement model = all factor loadings constrained equal.

Figure 4.0 Latent Path Diagram CFA – Total Primary Study Sample (N=779)
Proposed Gender Affirmative School Climate scale (GASC) indicators
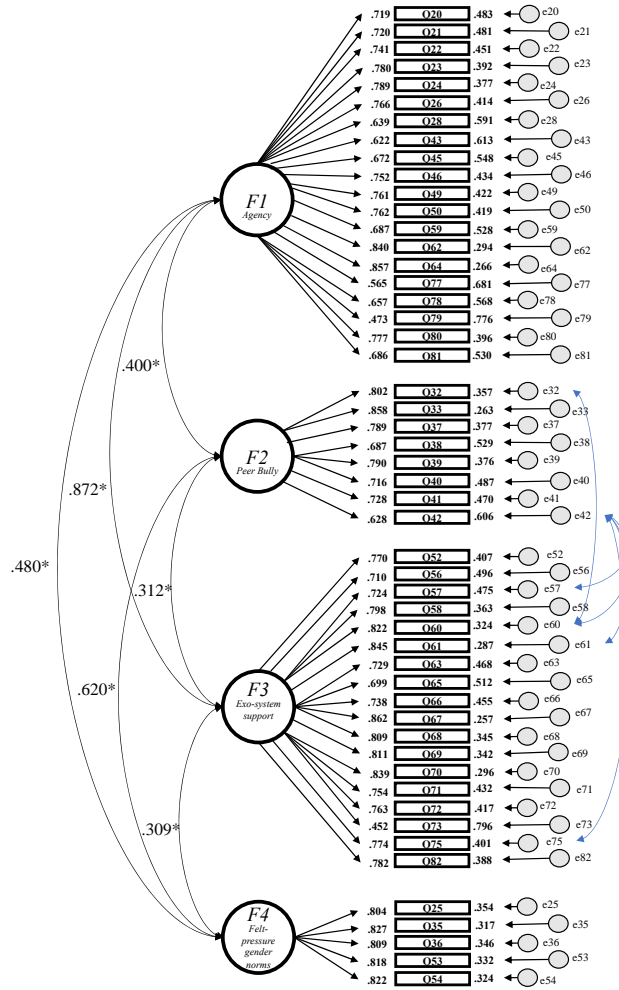
(χ2 = 7433.841; CFI = .872 ; RMSEA = .081 ; SRMR = .062)

Figure 5.0 Latent Path Diagram CFA – Primary Study - Transgender sub-sample
(N=377)
Proposed Gender Affirmative School Climate scale (GASC) indicators

169
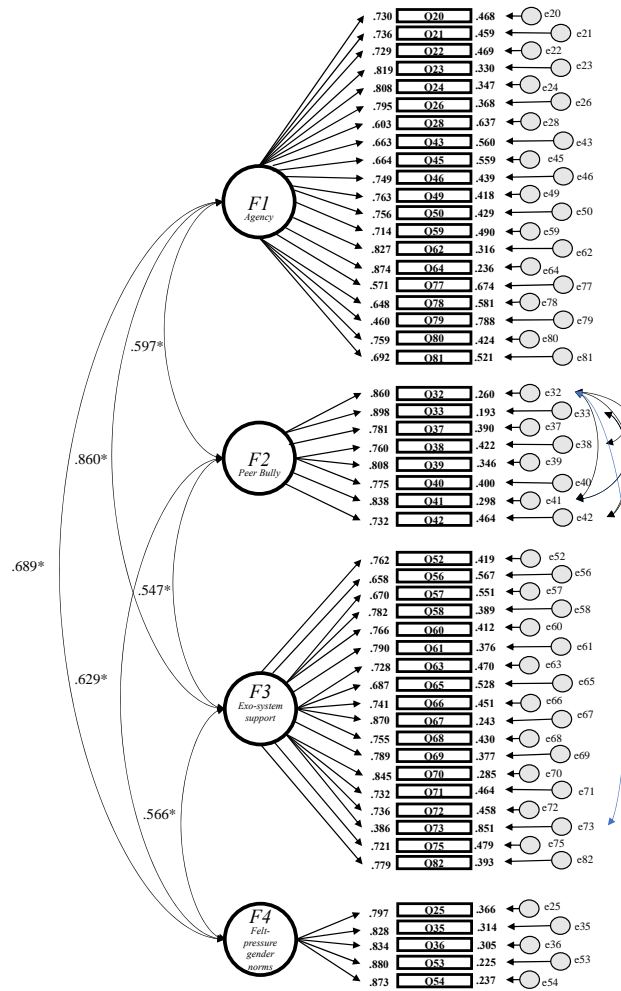
(χ2 = 3665.103; CFI = .895; RMSEA = .073 ; SRMR = .059)

Figure 6.0 Latent Path Diagram CFA – Primary Study - Non-transgender sub-sample
(N=269)
Proposed Gender Affirmative School Climate scale (GASC) indicators
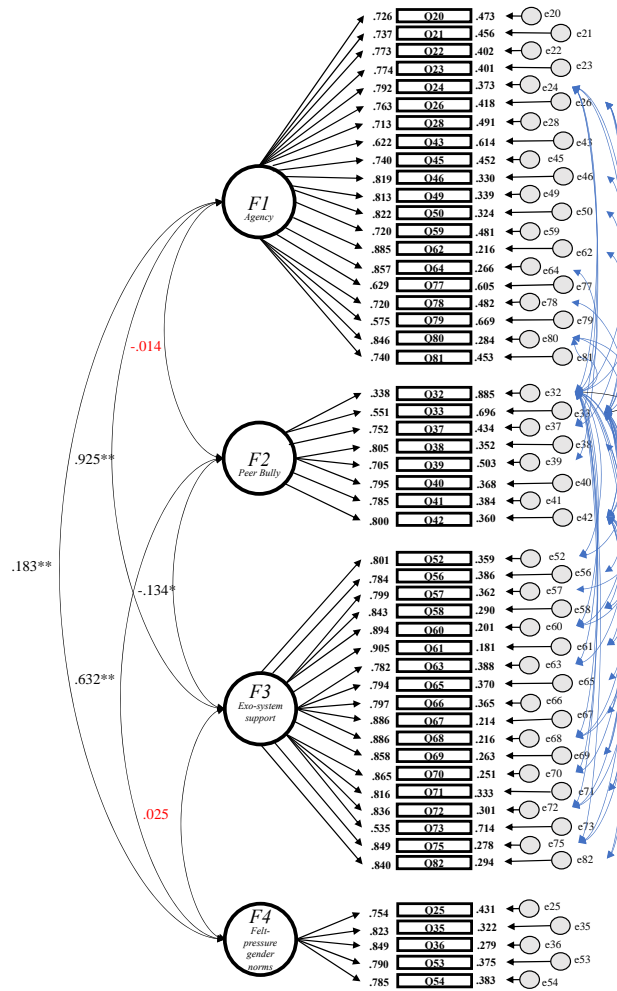
(χ2 = 3059.873; CFI = .925 ; RMSEA = .078 ; SRMR = .072)

Figure 7.1 Latent Path Diagram SEM – Measurement Model - Transgender sub-sample
(N=377)
Proposed Gender Affirmative School Climate scale (GASC) indicators predicting
Psychological Sense of School Membership (PSSM; Goodenow, 1993)

(χ2 = 5196.895; CFI = .857; RMSEA = .059; SRMR = .060)
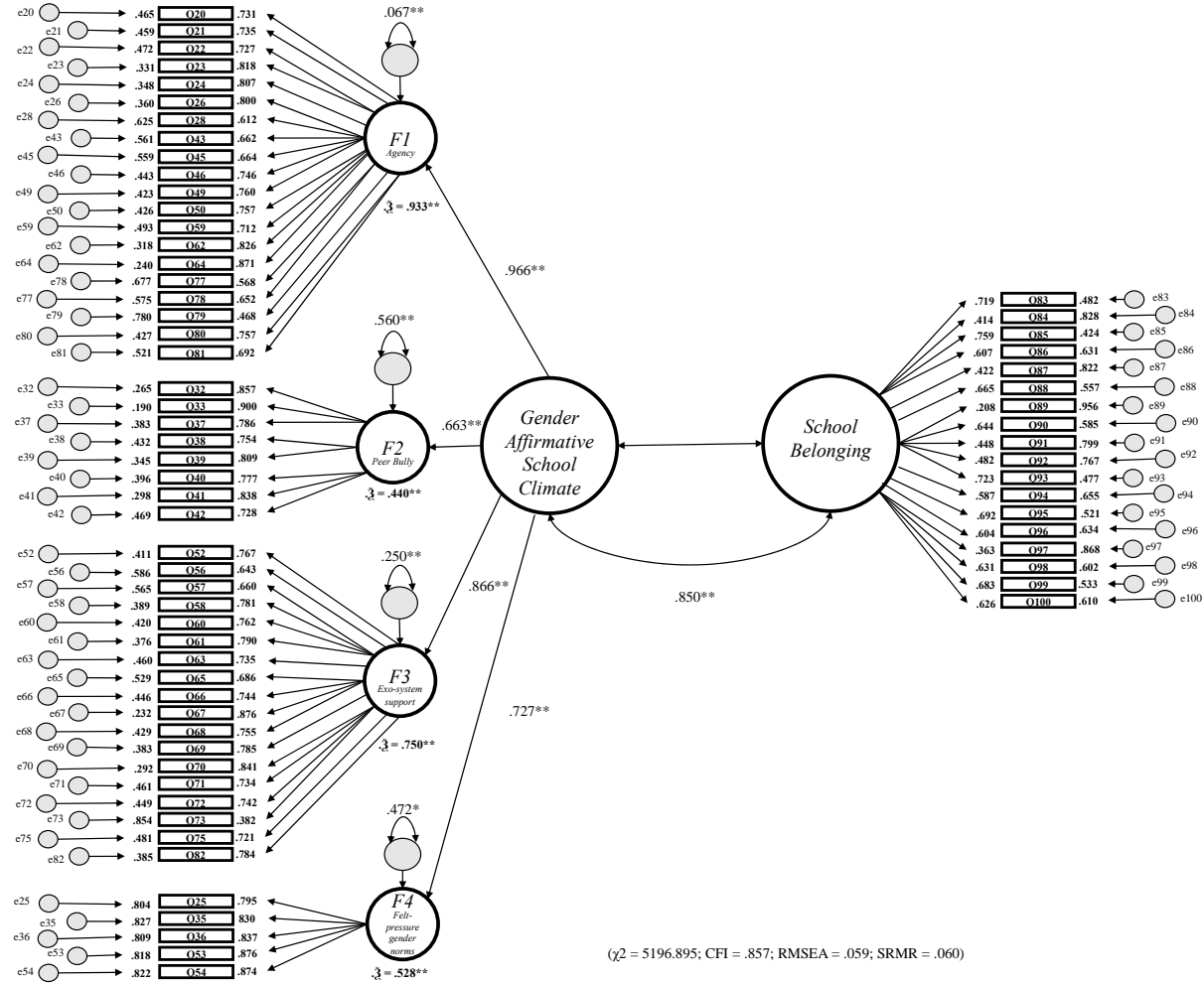
Figure 7.2 Primary Study - Latent Path Diagram –Structural Model - Transgender sub-sample (N=377)
Proposed Gender Affirmative School Climate scale (GASC) indicators predicting
Psychological Sense of School Membership (PSSM; Goodenow, 1993)

(χ2 = 5196.894; CFI = .857 ; RMSEA = .059 ; SRMR = .060)

172
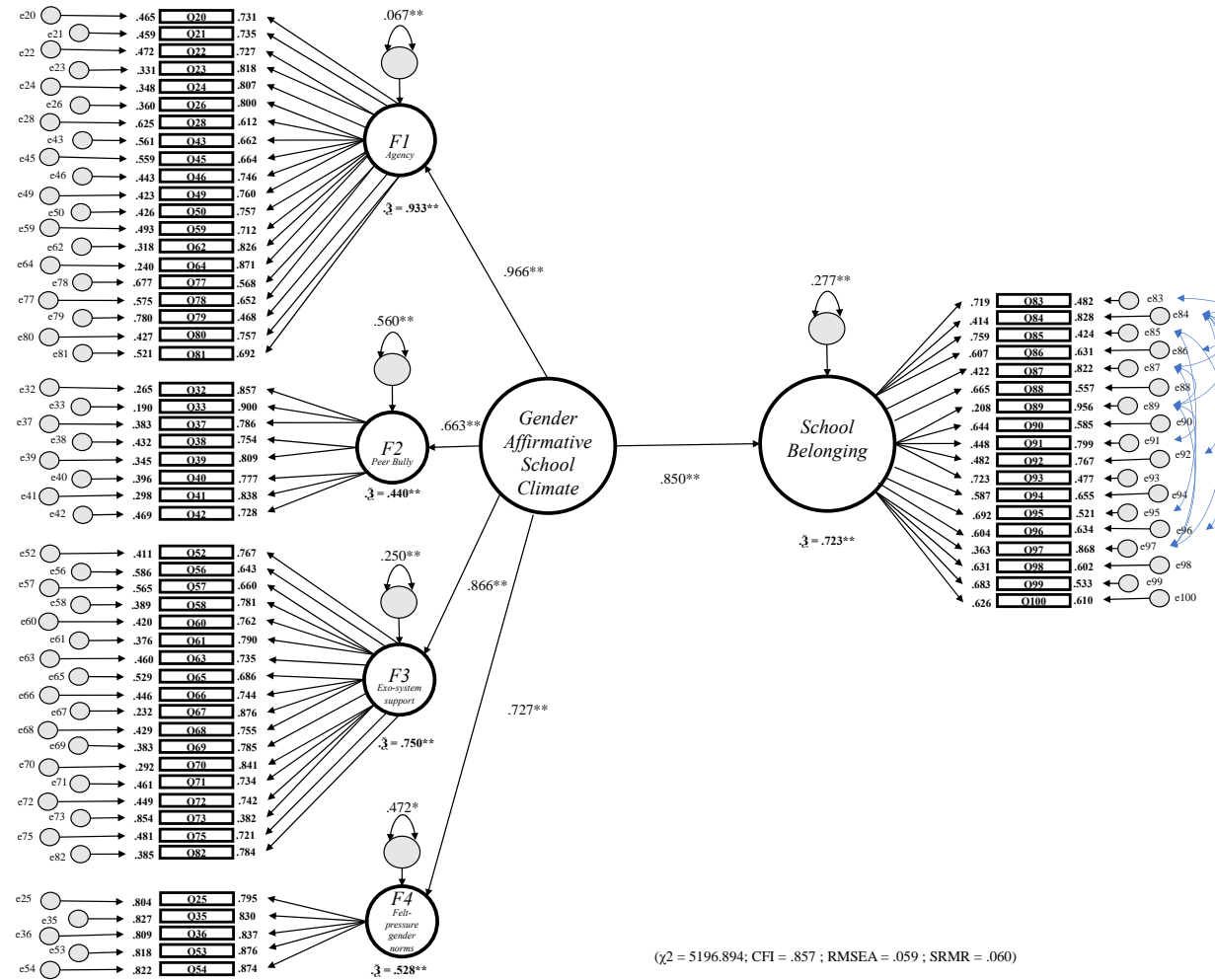
Figure 8.0 Primary Study - Latent Path Diagram –Structural Model - Non-transgender sub-sample (N=269)
Proposed Gender Affirmative School Climate scale (GASC) indicators predicting
Psychological Sense of School Membership (PSSM; Goodenow, 1993)
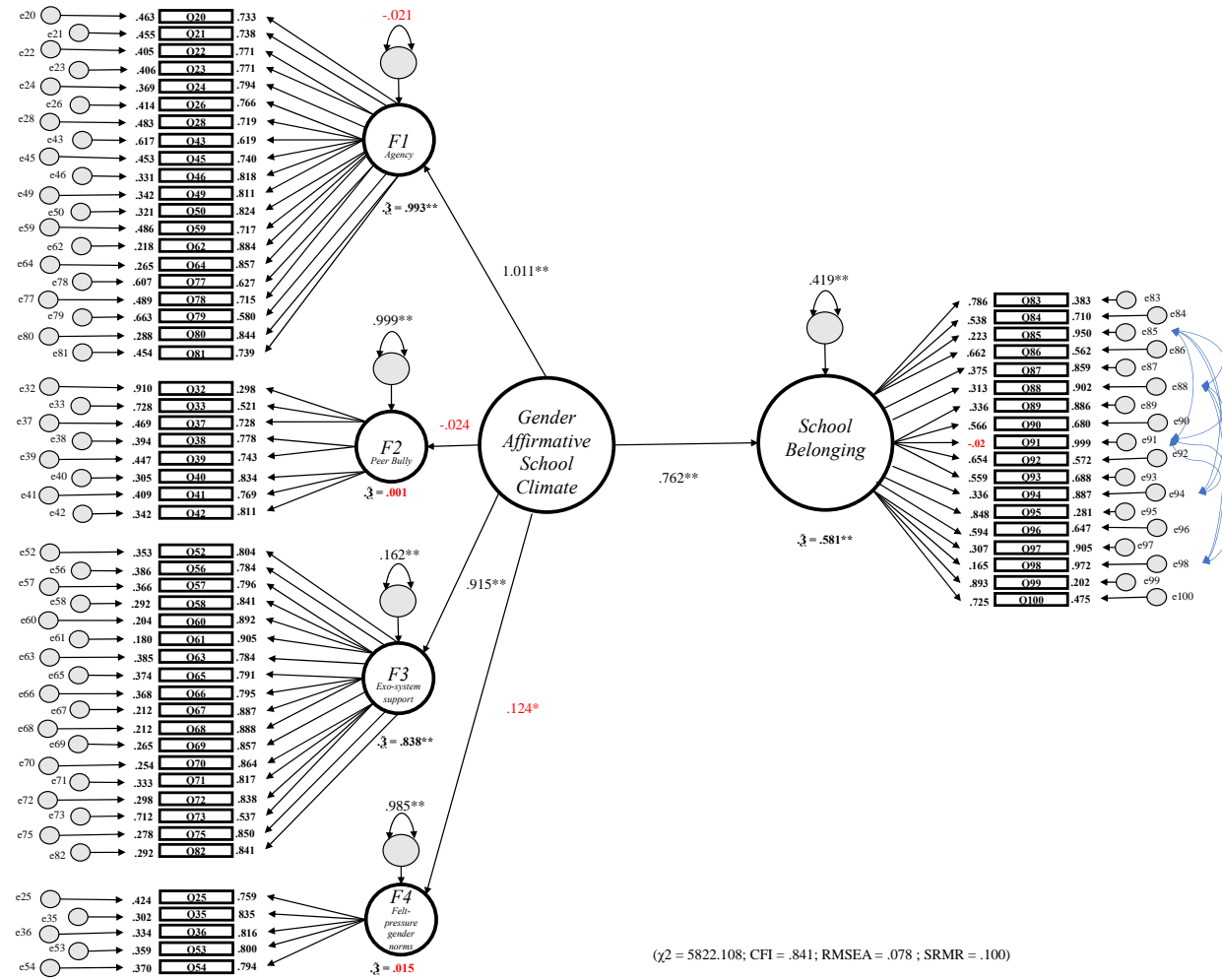
Figure 9.0 Primary Study - Latent Path Diagram – Trans Pride Interaction - Transgender sub-sample (N=377)
Proposed Gender Affirmative School Climate scale (GASC) indicators predicting Psychological Sense of School Membership (PSSM; Goodenow, 1993)

ML estimation used**
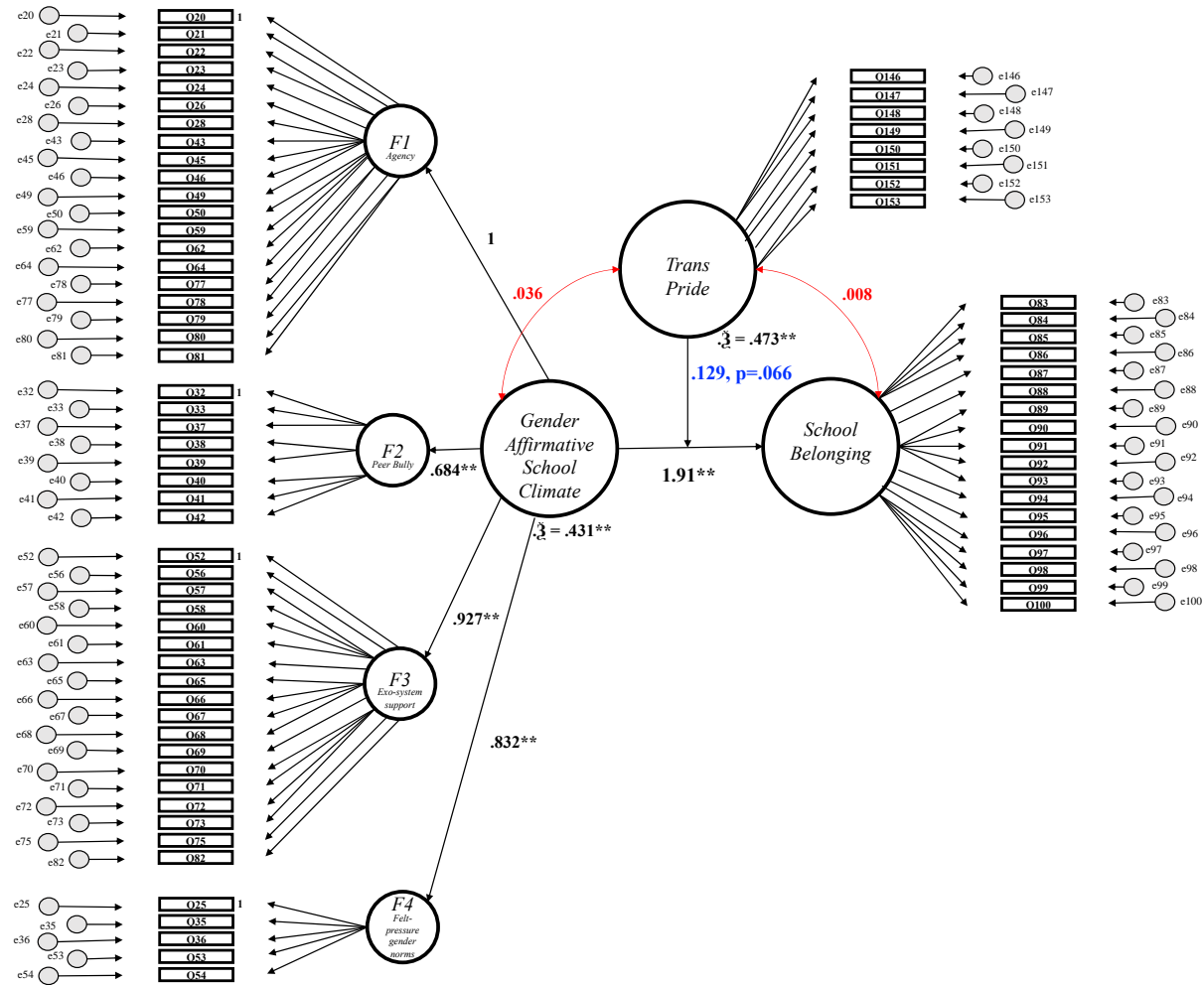
(AIC = 71361.606, SD = 75.16; BIC = 72372.193, SD = 75.16; ADJUSTED BIC = 71556.793, SD = 75.16)

174

Table 10.1
Correlations Matrix Scale Scores – Primary Study - Non-transgender identified (N =269)

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. GASClimate	-	.11	.11	.11	.11	.11	.11	.11	.11			
2. Agency	.956**	-	.11	.11	.11	.11	.11	.11	.11			
3. Peer Bully	.273**	.100**	-	.11	.11	.11	.11	.11	.11			
4. Exo Support	.907**	.872**	-.054**	-	.11	.11	.11	.11	.11			
5. Felt Press Gnd	.395**	.262**	.578**	.061**	-	.11	.11	.11	.11			
6. Ontological	.835**	.895**	.130**	.743**	.270**	-	.11	.11	.11			
7. School Belong	.705**	.673**	.326**	.577**	.322**	.617**	-	.11	.11			
8. Self-Esteem	-.396**	-.379**	-.120**	-.372**	-.076**	-.383**	-.560**	-	.11			
9. Activism	.436**	.480**	-.385**	.635**	-.289**	.422**	.329**	-.311**	-			
10. Sim Girls	.305**	.287**	-.007	.356**	-.053**	.274**	.251**	-.229**	.362**	-		
11. Sim Boys	.322**	.336**	-.100**	.390**	-.100**	.334**	.248**	-.127**	.458**	.176**		
12. Sim Non-B	-.090**	-.061**	-.038**	-.106**	-.011	.074**	.015	.087**	-.046**	.174**	.076**	1

* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed). *** $p < .001$ (two-tailed).

Table 10.2
Correlations Matrix Scale Scores – Primary Study- Transgender identified (N =377)

| Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. GASClimate	-	.11	.11	.11	.11	.11	.11	.11	.11			
2. Agency	.945**	-	.11	.11	.11	.11	.11	.11	.11			
3. Peer Bully	.676**	.524**	-	.11	.11	.11	.11	.11	.11			
4. Exo Support	.894**	.790**	.436**	-	.11	.11	.11	.11	.11			
5. Felt Press Gnd	.707**	.614**	.569**	.468**	-	.11	.11	.11	.11			
6. Ontological	.807**	.870**	.512**	.640**	.587**	-	.11	.11	.11			
7. School Belong	.744**	.712**	.553**	.618**	.558**	.617**	-	.11	.11			
8. Self-Esteem	-.300**	-.273**	-.169**	-.297**	-.211**	-.242**	-.500**	-	.11			
9. Activism	.103**	.052**	-.076**	.267**	-.064**	.006	.153**	-.168**	-			
10. Sim Girls	.087**	.050**	.042**	.162**	-.046**	.008	.050**	-.116**	.239**	-		
11. Sim Boys	.018	.035**	-.037**	.035**	-.029**	.035**	.094**	0.00	.173**	-.188**		
12. Sim Non-B	-.037**	-.047**	-.010	-.041**	.015	-.099**	.062**	.017	.082**	.193**	.019	1

* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed). *** $p < .001$ (two-tailed)

Table 10.3
Correlations Matrix Scale Scores – Primary Study Total Sample (N = 779)

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. GASClimate	-	.11	.11	.11	.11	.11	.11	.11	.11			
2. Agency	.950**	-	.11	.11	.11	.11	.11	.11	.11			
3. Peer Bully	.508**	.344**	-	.11	.11	.11	.11	.11	.11			
4. Exo Support	.895**	.829**	.203**	-	.11	.11	.11	.11	.11			
5. Felt Press Gnd	.570**	.457**	.572**	.266**	-	.11	.11	.11	.11			
6. Ontological	.821**	.882**	.353**	.689**	.450**	-	.11	.11	.11			
7. School Belong	.731**	.698**	.462**	.598**	.458**	.621**	-	.11	.11			
8. Self-Esteem	-.354**	-.333**	-.147**	-.350**	-.148**	-.315**	-.532**	-	.11			
9. Activism	.280**	.279**	-.214**	.486**	-.168**	.222**	.246**	-.259**	-			
10. Sim Girls	.206**	.179**	.021**	.288**	-.054**	.147**	.155**	-.193**	.329**	-		
11. Sim Boys	.131**	.152**	-.062**	.180**	-.054**	.149**	.144**	-.039**	.277**	-.052**		
12. Sim Non-B	-.047**	-.041**	-.020**	-.055**	.002	-.077**	.053**	.033**	.035**	.198**	.034**	1

* $p < .05$ (two-tailed). ** $p < .01$ (two-tailed). *** $p < .001$ (two-tailed)

Table 11.1 Means and Standard Deviations Scale Scores (N=377)
Means and Standard Deviations of Key Measures – Primary Study – Transgender sub-sample

Measure	n	M	SD	α	Min	Max
Proposed GASC Scale		179.44	56.00	.963	2.00	352.00
Agency F1		3.94	1.25	.938	.10	7.00
Peer Bullying F2		3.48	1.33	.877	.25	7.00
Exo and Meso-system support F3		3.13	1.89	.926	.06	6.89
Felt Pressure to Gender Norms F4		3.42	1.48	.888	.20	7.00
Ontological		3.90	1.48	.878	.40	7.00
School Belonging (PSSM)		54.52	12.79	.892	19.00	90.00
Self-esteem (ASQ)		37.27	6.94	.758	14.00	56.00
Activism (YII)		66.58	20.66	.927	29.00	132.00
Transgender Pride (TIS)		34.99	10.01	.863	8.00	56.00

Measure	n	M	SD	α	Min	Max
Similarity to peer group - girls		2.42	1.15	N/A	1.00	5.00
Similarity to peer group - boys		3.23	1.22	N/A	1.00	5.00
Similarity to peer group – non-bin		3.52	1.18	N/A	1.00	5.00

Table 11.2 Means and Standard Deviations Scale scores (N=269)

Means and Standard Deviations of Key Measures – Primary Study – Non-trans sub-sample

Measure	n	M	SD	α	Min-Max Min	Max
Proposed GASC Scale		193.96	58.32	.962	8.00	319.00
Agency F1		4.25	1.37	.953	.30	7.00
Peer Bullying F2		3.46	1.28	.862	.38	7.00
Exo and Meso-system support F3		3.63	1.56	.961	.06	7.00
Felt Pressure to Gender Norms F4		3.33	1.44	.882	.20	7.00
Ontological		4.24	1.55	.900	1.00	7.00
School Belonging (PSSM)		57.18	12.57	.878	9.00	90.00
Self-esteem (ASQ)		35.13	7.55	.783	12.00	56.00
Activism (YII)		76.39	27.06	.958	9.00	150.00
Similarity to peer group - girls		2.97	1.26	N/A	1.00	5.00
Similarity to peer group - boys		2.97	1.25	N/A	1.00	5.00
Similarity to peer group – non-bin		3.73	1.16	N/A	1.00	5.00

Table 12.1 OLS Regressions – Primary Study – Main effect

Summary of Hierarchical Regression Analysis for Variables Regressed on Self-esteem (Total N =646)

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Grade	-1.480	.057	-.196**	-1.171	.054	-.155**
GASC scale				-.044	.001	-.335**
R^2		.038			.149**	
F for change in R^2		670.140			2189.213**	

Note: Gender affirmative school climate is a total sum score.

*p < .05. **p < .01.

Table 12.2 OLS Regressions – Primary Study – Main effect

Summary of Hierarchical Regression Analysis for Variables Regressed on Self-esteem (Total N = 646)

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Grade	-1.480	.057	-.196**	-1.152	.055	-.152**
Individual Level				-1.399	.035	-.292**
R^2		.038			.122**	

F for change in R^2		670.140			1597.664**	

Table 12.3 OLS Regressions – Primary Study - Interaction

*Summary of Hierarchical Regression Analysis for Variables Regressed on **Self-esteem** (Trans N =377)*

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Grade	-.924	.070	-.125**	-.913	.070	-.123**
GASC scale	-.038	0.001	-.296**	-.039	.001	-.308**
Sim to Boys	-.010	.054	-.002	-.862	.182	-.152**
GASC by Sim B				.005	.001	.158**
R^2		.106			.108**	
F for change in R^2		392.362			24.014**	

Note: Sim to peer group boys was centered at the mean.

p < .05. **p* < .01.

Table 12.4 OLS Regression – Primary Study - Interaction

*Summary of Hierarchical Regression Analysis for Variables Regressed on **Self-esteem** (Trans N = 377)*

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Grade	-.881	.070	-.119**	-.750	.070	-.101**
GASC scale	-.037	.001	-.289**	-.042	.001	-.330**
Sim to Girls	-.493	.057	-.082**	1.905	.194	.315**
GASC by Sim G				-.013	.001	-.415**
R^2		.112			.127	
F for change in R^2		419.760			167.052	

Note: Sim to peer group girls was centered at the mean.

p < .05. **p* < .01.

Table 12.5 OLS Regressions – Primary Study - Interaction

*Summary of Hierarchical Regression Analysis for Variables Regressed on **Self-esteem** (Non-Trans N = 269)*

Variable	Model 1			Model 2		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Grade	-1.436	.085	-.189**	-1.377	.085	-.181**
GASC scale	-.048	0.002	-.356**	-.049	.002	-.369**
Sim to Boys	.043	.070	.007	2.463	.241	.409**
GASC by Sim B				-.012	.001	-.415**
R^2		.190			.203	
F for change in R^2		532.085			110.016	

Note: Sim to peer group boys was centered at the mean.

*p < .05. **p < .01.

Table 12.6 OLS Regressions – Primary Study – Main effect

*Summary of Hierarchical Regression Analysis for Variables Regressed on **School Belong** (Total N = 646)*

Variable	Model 1			Model 2		
	B	*SE B*	*β*	*B*	*SE B*	*β*

Grade	1.839	.101	.138**	.665	.070	.050**
GASC scale				.166	.001	.725**
R^2		.019			.537**	
F for change in R^2		328.657			18813.596**	

Note: Gender affirmative school climate is a total sum score

*$p < .05.$ **$p < .01.$

Table 12.7 OLS Regressions – Primary Study – Interaction

*Summary of Hierarchical Regression Analysis for Variables Regressed on **School Belong** (Total N = 646)*

	Model 1			Model 2		
Variable	B	SE B	β	B	SE B	β
Grade	.640	.070	.048**	.857	.070	.065**
GASC scale	.163	0.001	.714**	.163	.001	.712**
Youth Activism	.023	.003	.042**	.252	.010	.472**
GASC by Y Act				-.001	.000	-.448**

R^2	.539		.553
F for change in R^2	6541.339		544.553

Note: Youth activism was centered at the mean.

$*p < .05.$ $**p < .01.$

Table 12.8 OLS Regressions – Primary Study – Interaction

Summary of Hierarchical Regression Analysis for Variables Regressed on **School Belong** *(Trans N = 377)*

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Grade	1.089	.123	.068**	1.123	.124	.071**
GASC scale	.191	0.002	.787**	.192	.002	.790**
Trans Pride	.040	.012	.028**	.139	.031	.096**
GASC by Trans P				-.001	.000	-.074**
R^2		.638			.639	
F for change in R^2		3768.183			11.972	

Note: Transgender Pride was centered at the mean.

Table 12.9 OLS Regressions – Primary Study - Interaction

*Summary of Hierarchical Regression Analysis for Variables Regressed on **School Belong** (Trans N =*

377)

	Model 1			Model 2		
Variable	B	$SE\ B$	β	B	$SE\ B$	β
Grade	.504	.091	.037**	.526	.091	.039**
GASC scale	.175	0.002	.746**	.174	.002	.743**
Sim to Non-Bin	.952	.072	.088**	2.584	.248	.238**
GASC by Sim NB				-.009	.001	.157**
R^2		.563			.565	
F for change in R^2		4272.406			47.335	

Note: Sim to peer group non-binary was centered at the mean.

*p < .05. **p < .01.

Table 12.10 OLS Regressions – Primary Study – Interaction

Summary of Hierarchical Regression Analysis for Variables Regressed on **School Belong** *(Trans N = 377)*

Variable	Model 1			Model 2		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Grade	.582	.092	.043**	.697	.092	.051**
GASC scale	.175	0.002	.744**	.170	.002	.724**
Sim to Girls	-.204	.075	-.018*	1.915	.254	.172**
GASC by Sim G				-.011	.001	-.199**
R^2		.556			.559	
F for change in R^2		4147.465			76.141	

Note: Sim to peer group girls was centered at the mean.

*p < .05. **p < .01.

Table 12.11 OLS Regressions – Primary Study - Interaction

Hierarchical Regression Analysis for Variables Regressed on **School Belong** *(Non-Trans N = 269)*

	Model 1	Model 2

Variable	B	SE B	β	B	SE B	β
Grade	.976	.110	.077**	.988	.110	.078**
GASC scale	.154	0.002	.695**	.156	.002	.701**
Sim to Non-Bin	.840	.093	.077**	1.991	.323	.183**
GASC by Sim NB				-.006	.002	.110**
R^2		.509			.510	
F for change in R^2		2343.800			13.804	

Note: Sim to peer group non-binary was centered at the mean.

*p < .05. **p < .01.

Table 12.12 OLS Regressions – Primary Study - Interaction

*Summary of Hierarchical Regression Analysis for Variables Regressed on **School Belong** (Non-trans N = 269)*

	Model 1			Model 2		
Variable	B	SE B	β	B	SE B	β
Grade	1.009	.11	.080**	1.014	.11	.080**

GASC scale	.150	0.002	.675**	.152	.002	.684**
Sim to Girls	.415	.089	.042**	1.191	.306	.120**
GASC by Sim G				-.004	.001	-.084**
R^2		.504			.505	
F for change in R^2		2303.386			7.036	

Note: Sim to peer group girls was centered at the mean; $*p < .05.$ $**p < .01.$

APPENDIX B

INFERENCE AND USE ARGUMENT FOR VALIDITY

Inference and Use Argument (IUA) for Validity

Assumption 1 – Multi-contextual structure of school climate (Figure 1.0)

To advance understanding and measurement of school climate specific to the domain of gender it is necessary to consider a multi-contextual model. When organized in an ecological-transactional model, literature that highlights support among transgender students in middle and high school demonstrates that protection is multi-faceted, both proximal and distal factors each playing an important role (Scrofani et al. Under Review). Similarly, drawing on themes that emerged from a review of literature organized by Bronfenbrenner's ecological framework on LGBT support in school, Leung et al. (2022) concluded that a collaborative whole school approach may be the benchmark of support for LGBT students. Research shows that a multi-level conceptualization of school climate can be used as a tool to predict transgender student wellness outcomes.

The home emerges as a key overlapping ecology for transgender students contributing to their school climate. As a result, proposed scale indicators that make up the meso-system factor only focus on one topical domain, the home. School-based research shows that the home plays a significant role in contributing to school climate for transgender students (Kosciw et al. 2018). Likewise, gender affirmative model (GAM) theorists assert that school staff's correspondence with the parents of transgender students is a key factor in informing and supporting their well-being at school (Malpas, Glaesar, Giammattei, 2018; Lev & Wolf-Gould; 2018). Over half of the proposed indicators that touch on the meso-system between the school and the home were retained through scale development stages. Meso-system related questions hung together with exo-system

related support questions (touching on sub-domains 1) curriculum and 2) extracurriculars) on factor 3 in the model.

Assumption 2 – Breadth of school climate

In the US, the United States Department of Education uses three broad domains to define school climate: engagement, safety, and the environment. Each comprise of sub-domains used to understand 6-12th grade student, faculty, and parent perceptions of school climate (Lindstrom-Johnson et al., 2017; Bradshaw et al., 2014). Likewise, indicators of many school climate measures used for secondary school students are modeled after these three domains, and correspondingly, touch upon each. For example, the United States Department of Education School Climate Survey (EDSCLS) Wang, Murphy, & Kantaparn, 2016), the School Climate Assessment Instrument (SCAI-S-S) (Shindler et al., 2009) and the Comprehensive School Climate Inventory (CSCI-S) student surveys follow the three-domain model recommended by the USDOE. However, the SCAI is more extensive including indicators about community relations, administrative leadership, and student voice (Voight & Hanson, 2014).

To follow suit with the three-domain definition of school climate, indicators from the SCAI-S and the EDSCLS were used to inform created indicators and corresponding sub-domains of the Gender Affirmative Climate Scale (GASC) in the current study. Although the breadth of topic areas included on measures like the EDSCLS (Wang, Murphy, & Kantaparn, 2016) cover student perception of their school's respect of diversity, on most school climate measures questions specific to respect for gender diversity are either missing or limited. Echoing the themes outlined by the USDOE,

190

researchers have created school climate measures to help capture what supports LGBT students (DePedro, Lynch, & Esqueda, 2018; Coulter et al., 2016; Toomey, McGuire, & Russell, 2012), but the facilitation of gender (i.e. equity, inclusion, and education) in school spaces has yet to be isolated in a school climate measure. The breadth of topics on the LGBT composite was taken into account to develop scale indicators generated for the cognitive interview procedure.

Assumption 3 – Gender affirmative indicators

Adopting a gender affirmative approach to assess school climate is necessary because the school shows to be a salient ecology for gender development, especially among individuals who are the most at risk. The GASC scale's indicators are driven by the gender affirmative model (GAM) because its transactional approach highlights what schools can do to help. Also, the GAM corresponds with new research that shows that expanding this clinical model to the school domain promotes transgender wellness in spaces beyond the home (Luecke, 2011; Luecke, 2018; Goodrich & Barnard, 2018; Ullman, 2018). Research demonstrates that creating a positive school climate for transgender students requires that schools, above all, are *pro-active*, and prioritize gender equity, inclusivity, and education as a core mission to the school at large (Ullman, 2018; Luecke, 2011; 2018; Jones et al. 2016). Furthermore, extending the GAM to the school domain encourages school professionals to be conscious of their ability to promote or restrict students' freedom to identify or express the gender they are most comfortable in. This argument echoes the sentiment of the GAM applied to parent-child research which encourages parents to follow their child's lead in affirming their identities, and to adapt to

191

change (Menvielle & Hill, 2011; 2012). Accordingly, in research conducted by Ullman (2018) and Luecke (2018), self-agency emerges as an important feature of protection for transgender students in schools, and has been shown to facilitate positive school climate.

As a result, in the current study self-agency was chosen as the topical domain that encompasses the ontological latent factor of the GASC scale, informing school support at the individual level. Later in the scale development process, agency emerged as a latent domain across contextual levels, not juts at the individual level. For example, question 49, *Teachers and other staff have a collective sense of responsibility in creating a space for students of all genders (i.e. cisgender, transgender, and non-binary identified, etc.) to learn and thrive*, probes the extent to which micro-level support (from teachers) fosters a sense of agency for high school students. While question 78, *Students at my school are allowed to use bathrooms and locker rooms coinciding with their gender identity, rather than birth sex,* probes the extent to which school structures and spaces foster a sense of agency (specifically, freedom to use restroom that coincides with gender identity) for high school students.

Assumption 4 – Individual and school level indicators

As reviewed previously in the manuscript, school climate measures commonly base assessment on respondent's level of agreement on statements about the school or classroom (Brand et al., as cited in Voight & Hanson, 2014). At the same time, sometimes indicators probe about respondent's own experiences; consequently ask about their own attitudes or behaviors (Voight & Hanson, 2014). While most questions ask about level of agreement on statements about school spaces and supports, some

192

(corresponding to proximal processes of ontological and microsystem latent factor) ask about respondent's own attitudes or behavior. For example, *At my school students of all gender identities feel listened to, represented, and that they have a voice* (Shindler et al., 2009, SCAI-S-S), (adapted from the SCAI-S-S to target gender identity), asks the respondent to speak for the student body at large. In contrast, *When I'm at school I have the opportunity to be free to live in the gender that feels most real and comfortable* (GAM definition of gender health, Keo-Meier & Ehrensaft, 2018; pg. 13) asks the respondent to speak directly to their own experience.

Assumption 5 – The method of scoring the GASC is appropriate for assessing school climate across groups (by gender).

For most of the main hypotheses the total scale score for the proposed GASC scale was used for both non-transgender and transgender groups, and for questions that target the sample at large. There is little research on the breadth of the school climate of gender comparing transgender and non-transgender high school students. As a result, data analyses explored if the scope of school climate for gender diverse students is similar to that of cisgender students. There are a lot of moving pieces at each contextual level informing school climate for transgender identified students, perhaps more than for that of non-transgender identified. Empirical evidence drawn from the cognitive interviews, EFA/CFA, and measurement invariance procedure helped to complement analytic evidence presented to determine if the scope of school climate of non-transgender identified students is similar to that of transgender identified students. Based on the proposed factor structure, literature reviewed on transgender middle and high

school students (SScrofani et al., *Under Review*) suggests that a total score which encompasses total scores from each latent domain (initially content coincides with each contextual level) can be used to gauge school climate scores. Together, transactional and ecological systems approaches have the potential to grasp the complexity of transgender youth's experiences at school because proximal processes (i.e. peer-peer, teacher-student interactions, etc.) are not studied in isolation, or given precedence to, the influence of broader environmental influences (i.e. state mandated policy guidelines, etc.). As a result, using a total scale score for transgender students, as opposed to sub-scores for each latent domain conformed to the multi-dimensional quality of school climate revealed in the literature (Leung et al., 2022, SScrofani et al., Under Review).

Only one hypothesis applied a sub-scale score to test if more proximal support shows to be more supportive than more distal support in the school ecology. This is hypothesis is based on some research in the literature on transgender school climate that shows that proximal factors informing school climate, at the ontological and micro levels, promote student wellness outcomes more so than that of distal levels. Overall research concludes that this is due to their immediate accessibility (Scrofani, Under Review; Greytak, Kosciw, and Boesen, 2013). Unlike past research, results from OLS regression analyses in the section below show that proximal support was no more supportive than more distal, among the sample at large.

Overall, the measurement invariance and SEM procedures results suggest that the scope of the school climate of gender has important differences and similarities by gender group (transgender and non-transgender). Questions that interrogate gender-related risk in peer relationships, and felt-pressure to gender norms from peers and professionals at

194

school, showed to have more salience contributing to the school climate of transgender identified participants, than non-transgender identified participants. Still, more research is needed to determine if the scope of school climate for gender diverse students is similar to that of cisgender students.

APPENDIX C

MISSING DATA PRIMARY STUDY

Missing Data Analysis (continued)

Primary data missingness

First, based on missing value analysis (MVA) missingness at the case level is 39.73% (323), so remaining 60.27% (490) of cases do not have missingness. This excludes items that were only given to transgender participants. Second, value level missingness is 26.61% (25,097), leaving 73.39% (69,211) not missing. This excludes items that were only given to transgender participants.

Missing data patterns and frequencies

MVA results show that the five most common missing data patterns at the item level are demarcated by transition points on the online self-report instrument. In the order of most common drop-off patterns (the first being no missing data) Item 26 (and beyond), 61, 65, and 43 are all the first question to appear after the user clicks an arrow to toggle to the next screen. These results suggest that the five most common missing data patterns are not random, and in part are related to this methodological bias.

Drop-off rate at Q26 rises to 12.3% from .7% at the start of the proposed scale items (Q20). Following the second set of items of the proposed scale, drop-off rate at Q43 rises to 15.7%, the first question appearing after navigating to the next window. Drop-off at Q61 rises to 23.9%, up from approximately 20.7% (missingness at Q60) in the previous section. Last, drop-off at Q65 rises to 27.4%, up from approximately. 23.5% in the previous section of the school climate instrument.

Little's MCAR Test

Little's MCAR test (Little, 1998) was ran with the MVAs to test the null hypothesis that the data is missing completely at random (MCAR). Results of Little's MCAR tests suggest that the data is missing completely at random (MCAR), ($\chi2$ (df = 5450, N = 813) = 5337.812, p = 859).

Systematic Missingness

At the same time, results suggests that drop-off at question 26, 61, 65, and 43 is not random, and is biased beyond the design of the survey instrument. First, missingness on item transition points were each regressed on demographic variables, including gender identity, binary gender, sexual orientation, grade, and race. This process was followed by a running a crosstab analysis between each demographic variable and missingness on each drop-off variable to further examine frequencies by group and to interpret the chi-square statistic of relationship.

First, sexual orientation was the only demographic that showed to have a relationship with missingness on item 26 ($\chi2$ (df = 6 , N = 813) = 12.89, p = .045). Frequencies by group show a slight bias on missingness. Homosexual (14%), bisexual (12%), queer (14%), asexual (9%) and questioning (11%) groups have similar values of missingness relative to non-missing, compared to approximately 7% missingness for heterosexual identified participants. Overall, results of auxiliary analyses for missingness on question 26 are somewhat mixed. Sexual orientation did not show to predict missingness on question 26 in the logistic regression ran. Again, question 26 is the first question in the second set of questions of the school climate measure, so this is the first transition to a new window among the primary questions in the survey.

198

The next most common drop-off pattern is at Q61, this is the first item to appear after the fourth transition to a new screen on the school climate measure, (following the clicking an arrow on previous page). Questions in this block focus on school climate support at the school level. Similar to results on item 26, logistic regressions show that sexual orientation does not predict missingness on question 61, however chi-square analyses show otherwise, that sexual orientation has a relationship with missingness on item 26 ($\chi 2$ (df = 6 , N = 813) = 17.38, p = .008). Frequencies by group show a bias on missingness. Values of missingness relative to non-missing for all groups other than heterosexual ranges from approximately 21 to 29%, while missingness on question 61 is approximately 8% for heterosexual participants.

In addition, logistic regression results show that grade level predicts missingness at question 61 (B = -.269, p = .002). More specifically, the lower your grade, the more likely you are to drop off at question 61. This demonstrates that there may be a relation between grade level and drop off at Q61 in the sample. Likewise, further examination of chi-square analyses show that grade level has a relationship with missingness on item 61 ($\chi 2$ (df = 4 , N = 813) = 13.27, p = .010). Frequencies by group show a bias on missingness, values of missingness relative to non-missing for participants that are high school seniors is lower (approx. 17%) than the rate of missingness for juniors (approx. 25%), sophomores (approx. 24 %), and freshman (approx. 37%).

Last, logistic regression results show that binary gender predicts missingness at question 61 (B = .143, p = .027). More specifically, the higher score reported for binary gender (male =1, female = 2, non-binary = 3, etc.), the more likely you are to drop off at question 61. This demonstrates that there may be a relation between binary gender and

199

drop off at Q61 in the sample. Likewise, further examination of chi-square analyses show that binary gender has a relationship with missingness on item 61 ($\chi2$ (df = 4 , N = 813) = 11.48, p = .022). Frequencies by group show a bias on missingness, with the highest rate of missingness among female identified participants (approx. 31%), followed by non-binary (approx. 22%), male (approx. 20%), and third gender (approx. 14%). Similar to the percent missing among female participants at this point, 35% of participants that chose "none apply to me, I am…" dropped off at this point. This discrepancy is related to the larger amount of male identified participants sampled, compared to female participants.

The third most common drop-off pattern identified by the MVA is at question 65, the first question following the set that began at question 61. This is the fifth transition to a new screen on the school climate measure. Questions in this block focus on support within the domain of school curriculum. Chi-square shows that gender identity has a relationship with missingness on item 65 ($\chi2$ (df = 4, N = 813) = 9.72, p = .046). Frequencies by group show a bias on missingness, with the highest rate of missingness among participants identified as transgender (approx. 29%) and those that report that none of the gender identity choices applies to them (approx. 34%). However, logistic regressions results show that gender identity does not significantly predict missingness on question 65.

In addition, logistic regression results show that sexual orientation (B = .108, p = .052), grade (B = -.269, p = .001), and binary gender (B = .134, p = .030) each predict missingness at question 65. Results demonstrate that there may be a relation between theses demographic variables and drop off at Q65 in the sample. More specifically, the

200

higher score reported for sexual orientation (heterosexual =1, homosexual = 2, bisexual =

3, etc.), the more likely you are to drop off at question 65. Likewise, further examination

of chi-square analyses show that sexual orientation has a relationship with missingness on

item 65 (χ2 (df = 6 , N = 813) = 18.72, p = .005). Frequencies by group show a bias on

missingness, with the highest rate of missingness among participants identified as

Bisexual (approx. 33%), compared to approx. 27% missingness each for Homosexual,

Queer, and Asexual identified participants, 23% missingness for Questioning, and

approx. 9% missingness for Heterosexual identified participants.

Logistic regression results show that lower your grade, the more likely you are to

drop off at question 65 (B = -.269, p = .001). This demonstrates that there may be a

relation between grade level and drop off at Q65 in the sample. Likewise, further

examination of chi-square analyses show that grade level has a relationship with

missingness on item 65 (χ2 (df = 4 , N = 813) = 14.01, p = .007). Frequencies by group

show a bias on missingness. The lowest grade (9th) has the highest rate of missingness

(approx. 43%), followed by 10th (approx. 28%), 11th (approx.28%), and 12th (approx.

21%) grades consecutively.

The higher score reported for binary gender (male =1, female = 2, non-binary = 3,

etc.), the more likely you are to drop off at question 65 (B = .134, p = .030). This

demonstrates that there may be a relation between binary gender and drop off at Q65 in

the sample. However, further examination of chi-square analyses show that binary gender

does not have relationship with missingness on item 65 (χ2 (df = 4 , N = 813) = 7.58, p =

.108).

The fourth most common drop-off pattern identified by the MVA is at question 43, the first question following the set that began at question 26. This is the second transition to a new screen on the school climate measure. Questions in this block focus on school support within the domain of teachers and staff. Questions in the preceding block focused on peer bullying and support. Overall, results of auxiliary analyses for missingness on question 43 are mixed. While sexual orientation did not show to predict missingness on question 43 in the logistic regression ran, sexual orientation was the only demographic significantly related to missingness on question 43 in chi-squares ran ($\chi 2$ (df = 6 , N = 813) = 14.90, p = .021). The groups with the least amount of participants, including heterosexual (N=86) and questioning (N=38) (excluding "prefer not to say"), had the lowest rate of missingness at item 43. While homosexual (17%), bisexual (18%), and queer (18%) have similar amounts of missing to non-missing on item 43.

In addition, logistic regressions ran showed that grade level predicts missingness at question 43, marginally (B = -.191, p = .057). Results suggest that the lower your grade, the more likely you are to drop off. Overall, results demonstrate that there may be a relation between grade level and drop off at Q43 in the sample, and sexual orientation and drop off at question 43, however results are inconclusive at this drop-off point.

Conclusions

The five most common missingness patterns were reviewed in the preceding section. MVA analysis shows that missingness patterns are monotone for the most common missingness patterns identified. In other words, if missing on item 26, 61, 65, and 43 then item data was missing on all successive variables. Overall, results reviewed

202

suggest that the most common patterns of missingness (drop-off at item 26, 61, 65, and 43) are not completely at random, but are selectively biased by some of the demographic variables tested. At the same time, there was planned missingness in the design of the survey instrument. Each of the most common missingness patterns occurred when the user had to click to navigate to the next window. Furthermore, although outcome of Little's MCAR (Little, 1988) test suggests that the data is missing completely at random (MCAR), auxiliary analyses confirm that drop-off patterns are missing at random (MAR).

First, predicting drop-off at the two earliest transitions to a new window during the school climate measure, first at item 26 and second at item 43, showed mixed results in the auxiliary analyses ran, compared to drop-off at later transition points, at item 61 and item 65. Sexual orientation was the only demographic that showed to have a relationship with missingness on item 26. Related, there is some evidence to suggest that sexual orientation and grade level had an influence on drop-off at item 43, however results for grade level were only marginal. The marginal results suggest that the lower participants grade, the more likely to drop off at item 43. Participants that did not identify as heterosexual had slightly more drop-off at item 26 and item 43.

However, drop-off later in the school climate scale, at item 61 and item 65, showed to be related to demographic variables including sexual orientation, binary gender, and grade level in the auxiliary analyses ran. Like earlier drop-off points, the lower participants grade, the more likely to drop off at item 61 and item 65. The higher score reported for binary gender (male =1, female = 2, non-binary = 3, etc.), the more likely participant drop-off at question 61 and at question 65. So, participants that identify

as "male" are more likely to drop-off. Furthermore, there was some evidence to suggest that gender identity has a relationship with missingness on item 65, however results from all analyses ran were mixed.

Based on the results of missing data analyses reviewed multiple imputation was chosen to handle missingness on items. First the SPSS version 12 compatible random number generator was used to set the starting sequence value (2000000) to reproduce a sequence of random numbers for the imputations. This is a regression approach which generates multiple iterations to find suitable data. Based on the monotone pattern of missingness, monotone was selected as the imputation method, and 20 imputations was used to find a robust solution. All items on the proposed school climate scale, and scales corresponding with outcome and moderators, were used as predictors and imputed in the model.

Missingness on transgender pride and shame items

First, based on missing value analysis (MVA) missingness at the case level is 39.63% (191), so remaining 60.37% (291) of cases do not have missingness. This includes items only seen by transgender participants to complete on the self-report survey. Second, value level missingness is 36.86% (3,553), leaving 63.14% (6,087) not missing.

Missing data patterns and frequencies

MVA results show that the only missing data patterns at the item level are either completion of all of the items (no missingness), or missingness on all transgender participant specific items. Based on the MVA and auxiliary analyses presented in the

204

previous section, the latter case is likely due to drop-off on transition points at item 26, 43, 61, and 65. No skip patterns in missingness were identified beyond the monotone pattern identified. Based on these results we conclude that there are no notable missing data patterns at the item level. These results suggest that missingness on the transgender pride and shame scales is random, and there is no notable methodological bias.

Little's MCAR Test

Little's MCAR test (Little, 1998) was ran with the MVAs to test the null hypothesis that the transgender item data is missing completely at random (MCAR). Results of Little's MCAR tests suggest that the data is missing completely at random (MCAR), (χ2 (df = 97, N = 482) = 107.89, p = .211).

Conclusions

Based on the results of missing data analyses reviewed multiple imputation was chosen to handle missingness on items for the transgender shame and pride scales. First the SPSS version 12 compatible random number generator was used to set the starting sequence value (2000000) to reproduce a sequence of random numbers for the imputations. This is a regression approach which generates multiple iterations to find suitable data. Since no specific pattern of missingness was identified, "automatic" was selected as the imputation method, and 10 imputations was used to find a robust solution. All items on the "shame" and "pride" scales were used as predictors and imputed in the model. Remaining items on the self-report survey, including the school climate measure and school-based wellness outcomes were used as predictors in the model.

APPENDIX D

DATA COLLECTION MATERIALS

Consent (Ages 15 – 17)

Gender Affirmative School Climate: A new approach to highlight protection comparing transgender and cisgender high school students

My name is Stephan Scrofani. I am a graduate student at Arizona State University. I am working on my dissertation and would like your help.

I am asking you to take part in a research study because I am trying to develop a new school climate scale for high school students that focuses on gender. Your parents' permission is not needed to participate in this study.

If you agree, you will be asked to participate in a **Zoom interview.** More specifically, you will be asked 1) to answer proposed survey questions (which make up the school climate scale being developed), and 2) to answer interview prompts about your comprehension of proposed questions and concepts. In addition, the interview concludes with 3) prompts that will ask you to expand on what survey concepts mean to you.

Answering these questions will take about **45 minutes – 1 hour.** You do not have to answer any questions that make you feel uncomfortable.

There are no foreseeable risks or discomforts to your participation. At the same time, we want to make sure you are doing it in a place that is private and in which you feel comfortable**.** If you have any concerns about completing a survey that might reveal something personal about you (e.g. gender identity) to someone important who doesn't already know, we recommend you arrange for a time to meet to complete the survey in a private setting.

You do not have to be in this study. No one will be mad at you if you decide not to do this study. Even if you start the study, you can stop at any time if you wish. You may ask questions about the study at any time.

If you decide to be in the study, I will not tell anyone else how you respond or act as part of the study. Even if your parents ask, I will not tell them about what you say or do in the study.

Signing here means that you have read this form and that you are willing to be in this study.

Signature of subject_____

Subject's printed name _____

Signature of Investigator_____

Date_____

Consent Form (18 years and up)

I am a graduate student under the direction of Professor Carol Lynn Martin, PhD in the T. Denny Sanford School of Social and Family Dynamics at Arizona State University. I am conducting a research study to develop a new school climate scale for high school students that focuses on gender.

I am inviting your participation, which will involve a semi-structured interview (Zoom platform) in which you will be asked 1) to answer proposed survey questions (which encompass school climate scale being developed), and 2) to answer interview prompts about your comprehension of proposed questions and concepts therein. In addition, the interview concludes with 3) prompts that will ask you to expand on what survey concepts mean to you. The interview will take **approximately 45 min – 1 hour.** You have the right not to answer any question, and to stop participation at any time.

Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. All participants will be compensated with a **20$ digital gift card** at the completion of the study. You will have the choice of different vendors, including **Amazon and GrubHub.** To maintain anonymity, the reward delivery process will be linked to a separate Qualtrics form. You must be a **high school student (Ages 15 – 18) to be eligible to complete** the study. If you are 18 years old and have graduated within the past few months, you are still eligible to participate.

Although there are no direct benefits for participation, your responses will be used to help create a new school climate scale that aims to measure the ways high schools can be pro-active to create an environment students of all gender identities can thrive. More specifically, your participation will help us to develop a scale to measure the extent to which US high school acknowledge their own role in creating a safe space that is equitable, inclusive, and diverse.

There are no foreseeable risks or discomforts to your participation. At the same time, we want to make sure you are doing it in a place that is private and in which you feel comfortable. If you have any concerns about completing a survey that might reveal something personal about you (e.g. gender identity) to someone important who doesn't already know, we recommend you arrange for a time to meet to complete the survey in a private setting.

To maintain confidentiality after data has been collected, all identifiers (such as your name) will be destroyed. There will be no way to link the data to your name. Your responses will be anonymous. The results of this study may be used in reports, presentations, or publications but your name will not be used. Furthermore, de-identified data collected as a part of current study will/will not be shared with others (e.g., investigators or industry partners) for future research purposes or other uses')

208

Zoom video and audio will NOT be recorded.

If you have any questions concerning the research study, please contact the research team at: Carol.Martin@asu.edu and sscrofan@asu.edu. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

By signing below you are agreeing to be part of the study.

Name:
Signature: Date:

Cognitive Interview Script

I. Introduction – *Thank you for your interest in our research and taking the time out of your day to be a part of our study. You have been recruited to help us develop a scale to be used to capture a new construct of school climate among high school students attending schools in the United States. **Generally speaking, school climate is a broad and multi-faceted concept that informs the quality of life at school (NCSSLE, 2022; National School Climate Council, 2022). For example, the characteristics of school climate include teacher connectedness with students, the culture of equity (such as fairness to students of diverse backgrounds), peer bullying, and even structural characteristics, such as physical cleanliness.** Unlike past school climate scales, this is the first of its kind to focus specifically on gender. So, the following questions will ask you about school supports that promote gender inclusion, equity, and diversity. **To illustrate,** some examples of characteristics of school climate specific to the domain of gender include (but are not limited to): 1) gender integrated learning versus single sex (so this is an example of gender inclusion), 2) topics in curricula that educate beyond traditional gender norms (gender diversity), and 3) topics in curricula that advocate for equal rights for women (gender equity).*

The interview will take approximately 1 hour. Please feel free to not respond to any survey questions or interview prompts you don't feel comfortable responding to. There is no penalty for not answering any questions.

Now, I will briefly explain the overall procedure, and then we will jump into the survey instructions and questions.

II. Procedure- ***You will be asked to complete the proposed Gender Affirmative School Climate scale (GASC) to the best of your ability, stopping after each section for discussion. Stops will be shown in red font on the screen. Please mark any question that you are having difficulty responding to because of comprehension. Also, please mark any question that you don't feel comfortable responding to.***

First, I will read survey instructions and key item definitions out loud. Next, I will read each question out loud and you will be given a moment to record your best answer on a piece of paper. (If you don't have a paper or a writing instrument, you can use your computer or an electronic device.)

After you complete each section of the survey, the self-report completion of proposed scale items will pause for discussion. Key of terms and each question will be shared on the screen while questions are read out load.

The interviewee will resume to self-report the next block of questions, corresponding with the next subject domain, after Q1-3 is asked.

Finally, the interview will conclude with question prompts designed to explore high school students' narratives about what it means to be in a school space which promotes gender

inclusion, equity, and diversity, (personally, and for the study body at large). When answering these questions, you may expand on themes that have already come up in the proposed items reviewed, or think of supports or risks in your school that may not relate to proposed questions.

III. Questions – PART 1. Interrogates reading comprehension and general understanding of concepts from questions in each domain (and sub-domain) encompassing school climate
1.) Explain in a few words what you think the last set of questions focused on. **(Note: Write down participant responses on paper.)**

2.) Did you have trouble understanding any of the questions? **(Highlight each on your notes)**

> *2a.) If so, which questions were difficult to understand? Can you tell me why?*

> *2b.) Were there any words that were difficult to understand (Puskulluoglu et al., 2013)?*

> *2c.) If you can, can you think of a better way to ask the question (Puskulluoglu et al., 2013)? (Question will only be asked if question is understood conceptually, but has problems with language use).*

3.) Did you feel uncomfortable reporting any questions?

4.) Did you feel that any questions were Not Applicable to the extent that you may skip this item or put a "4"?

5.) Are there any questions that stood out as hard to answer because you don't have enough information or knowledge to give an informed decision- to the extent that you would skip this question?

IV. Questions – PART 2. Explores high school students' narratives about what it means to be in a school space which promotes gender inclusion, equity, and diversity, (personally, and for the study body at large). Questions 6-7 will be asked after all proposed survey questions are asked and discussed, interrogating Q1-5.

When answering the following questions, you may expand on themes that have already come up in the proposed items reviewed, or think of supports or risks in your school that may not relate to proposed questions.

6) Overall, do any supports or risks at your school come to mind that may or may not relate to the themes in the questions you just answered?

*7) Have you **experienced or witnessed** school supports that **promote gender equity** (such as topics in curricula that advocate for equal rights for women)?*

*7a.) ...**promote inclusion** (such as gender integrated learning versus single sex)?*

*7b.) and/or **promote diversity** (such as topics in curricula that educate beyond traditional gender norms)?*

*7c) Likewise, Have you **experienced or witnessed risks** in school spaces that **restricts gender equity, inclusion, and/or diversity** that have not been asked about? If yes, summarize one or two risks that stand out the most.*

Cognitive Interview Instructions

Gender Affirmative School Climate Scale – GASC Scale - Sample Survey instructions and list of indicators (approx. 56 total):

On a Likert scale from 1-7, (1 Strongly disagree, 2 Disagree, 3 Somewhat Disagree, 4 Neither Agree or Disagree, 5 Somewhat Agree, 6 Agree, and 7 Strongly Agree), please rate the extent to which you agree with the following statements:

Please take your time to listen to each question carefully. Some of the questions will ask you about your personal experience at school, while others ask for you to speak to the climate of school spaces and people within. The survey has been designed to assess how both students with cisgender and transgender identities are supported in high school. While this may be the first time you have been asked about how your gender identity is affirmed at school, or the first time you considered the climate of gender at your school, please take a moment to consider each question.

Furthermore, for each question **we ask that you comment on your current experience in high school, based on your experience now, going back to the start of the academic year**.

Throughout the survey, **"This school"** *means activities happening in school buildings, on school grounds, on school buses, and at places that hold school-sponsored events or activities. Unless otherwise specified, this refers to normal school hours or to times when school activities/events were in session*

There are no right or wrong answers, please give your best response. You may skip any question you don't feel comfortable reporting. Please review the key of terms before you begin.

I recommend you use a paper and pencil to jot down your response for each question. If you don't have paper or a pencil handy, you can use your computer.

Remember to pause at the end of each section. We will meet to briefly discuss after each set of questions. You will see STOP at the end of each section. Let the interviewer known when you complete each section on Zoom.

<div style="border: 1px solid black; padding: 10px;">

Key of terms

Cisgender- an individual's assigned sex at birth is aligned with their gender identity

Transgender- an individual declares their gender as something other than what is reflected by the sex marker on their birth certificate. This may include male to female (MTF), female to male (FTM), male to other, or female to other. Moreover, is an umbrella term for binary and non-binary identified transgender people.

Gender diverse identity- Umbrella term for individuals whose gender identity or binary identity departs from prescriptions that exist in society and culture as the norm

Gender privilege- advantages or rights that are available to individuals solely on the basis of their sex.

Gender-related harassment- behaviors and speech that make someone feel bullied because of their actual or perceived gender identity. In many cases, prejudice is motivated by person's perceived lack of fit with gender norms, or may specifically target transgender students (i.e. transphobic harassment). However, prejudice may also be motivated by fitting to gender norms. For example: "She is a sissy" and "He is sissy" both are gender-related harassment.

Transphobia/Trans negativity- A range of attitudes, feelings, and behaviors ranging from the idea that being transgender is less optimal than being cisgender to hatred and disgust toward anyone perceived to diverge from gender expectations.

Microaggression- a comment or action that subtly, and often unconsciously or unintentionally, expresses a prejudiced attitude toward a member of a marginalized group (such as a gender minority or racial minority), or prejudice against women.

Gender affirmative/ gender affirmative school climate- the extent to which schools are pro-active in facilitating a culture of equity for the student body at large, and on an individual level, speaking to the schools' ability to facilitate each student's *gender health*; *gender health* is defined as the students' ability to live in the gender that feels most real and comfortable to them, and to express that gender with freedom from restriction, aspersion, or rejection.

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Cognitive Interview (Pilot 1) – Proposed Survey Questions

Ontological (a)

I. Grants self-agency

1. When I'm at school I'm free to live in the gender that feels most real and comfortable (GAM definition of gender health, Keo-Meier & Ehrensaft, 2018; pg. 13).

2. Gender exploration is considered developmentally appropriate at my school (based on Luecke, 2018, p. 274).

3. My school advocates that you are free to take the lead in _identifying_ with your gender, apart from what may be expected of you (inspired by transactional gender affirmative model; Ehrensaft, 2011)**.**

4. My school advocates that you are free to take the lead in _expressing_ your gender, apart from what may be expected of you.

5. At my school gender questioning is considered normal.

6. Overall, my school does not restrict, but helps to support my gender identity (inspired by Ullman, 2018; Luecke, 2018).

7. At my school students of all gender identities feel listened to, represented, and that they have a voice (Shindler et al., 2009, SCAI scale; adapted).

STOP HERE for interview prompts

Microsystem (b)

(Use "agreement" 7-point Likert scale for all indicators, described above)

I. Peer gender empowerment (Peer social-emotional support)

1. My peers at school support me, regardless of my gender identity.

2. Regardless of my gender identity, I feel I'm included in peer groups at school.

3. My peers are willing to intervene (to help), when witnessing gender-related and transphobic harassment (adapted from Wernick et al., 2014).

4. I have friends at school who I freely talk to about topics that expand the traditional concept of gender, such as gender diversity and equity.

5. My peers at school befriend students of all gender identities.

6. I find it hard to make close friends at school because of my gender identity
      (Reverse).

7. **Students of different gender identities blend, interrelate and feel like valid**
        members of the community (Inspired by ASSC's – SCAI-S-G Shindler, J.,
Jones, A., Williams, A.D., Taylor, C., & Cadenas, H., 2016).

8. I have witnessed relational microaggressions towards another peer, such as
spreading rumors, or peer exclusion, because of their gender identity. (Reverse)

9. I have been the victim of relational microaggressions from my peers because of
my gender identity, such as exclusion, or the spreading of rumors (GLSEN 2017
findings report vast majority trans/gender minority experience are microaggressions
(Reverse).

STOP HERE for interview prompts

II. Staff gender empowerment (Staff social-emotional support)

1. Teachers/and other staff at school support me in my gender identity.

2. Regardless of my gender identity, teachers/and other staff include me in activities
and call on me to participate.

3. My teachers/other staff are willing to intervene (to help), when witnessing gender-
related and transphobic harassment (adapted from Wernick et al., 2014).

4. Teachers/and other staff freely talk about topics that expand the traditional
concept of gender, such as diversity and equity.

5. Teachers/ and other staff at my school don't give preferential treatment to
      students because of their gender identity or biological sex.

6. I find it hard to have close relationships with teachers/ and other staff at my
school because of my gender identity. (Reverse)

7. Teachers/ and other staff have a collective sense of responsibility in creating a
space for students of all genders to learn and thrive.

8. I feel comfortable reporting gender-related bullying or harassment to teachers/
and other staff without fear that their own gender biases/ opinions would prevent
the issue from being heard, or taken seriously.

9. Students at my school are fairly disciplined, regardless of their gender identity.

III. Language/narratives

1. Pronoun use by teachers/and other staff at my school respects my gender identity, regardless of whether its aligned with my birth sex (inspired by Ullman, 2018).

2. Pronoun use by my peers at school respects my gender identity, regardless of whether its aligned with my birth sex (inspired by Ullman, 2018).

Mesosystem (c)

I. Home

1. The perceptions of parents/families *harm* my school's initiative to create a safe space for transgender and other gender diverse youth. (Reverse)

2. The perceptions of parents/families *help* my school's initiative to create a safe space for transgender and other gender diverse youth.

3. My school runs outreach programming (i.e. community or after school events, activities, fundraisers, etc.) focusing on educating about gender equity designed to connect with students' extended social network, including their families.

4. My school runs outreach programming (i.e. community or after school events, activities, fundraisers, etc.) focusing on educating about gender diversity designed to connect with students' extended social network, included their families.

5. Regardless of the perceptions of families in the greater community, my school is committed to advocating for gender equity.

6. Regardless of the perceptions of families in the greater community, my school is committed to advocating for the needs of gender diverse students.

7. My school provides trans and other gender diverse students equal access to educational programs and activities, even in circumstances in which parents raise objections or concerns (NJ Transgender Student guide for school districts; https://nj.gov/education/ students/safety/sandp/transgender/).

8. **My school sends out at least one notice to parents informing them of the rights of transgender and other gender diverse identities in school spaces.**

Exo-system (d)

I. Professional Development/Gender Programming

1. **My school has a sense of a vision, or mission that focuses on expanding the understanding of gender** (Shindler et al., 2009, SCAI ; Luecke, 2018, p.274).

2. **Regardless of the visibility of transgender and other gender diverse students, my school is pro-active in creating a safe space for transgender and gender diverse students** (inspired by Ullman, 2018).

3. **My school's programming initiative focuses on minimizing the salience of gender in school spaces, such as discouraging the organization of students by gender in and out of the classroom.**

4. **My school purposefully cultivates a gender affirmative discourse** (Shindler et al., 2009, SCAI).

STOP HERE for interview prompts

II. Curriculum

1. **The curriculum at my school challenges gender privilege through expansive curricula and pedagogy** (Luecke, 2018, p.274)**.**

2. **The curriculum at my school challenges traditional gender stereotypes through expansive curricula and pedagogy** (Luecke, 2018, p.274).

3. **My school curriculum is inclusive and sensitive to current social issues centering around gender diversity.**

4. **I have learned about transgender and other gender diverse role models at my school.**

STOP HERE for interview prompts

III. Extra-curricular

1**. Extracurricular activities at my school are inclusive to transgender and other gender diverse youth.**

2**. My school has social support groups designed to empower transgender and other gender diverse youth.**

3. **My school has a social support group/s designed to create an allegiance between cisgender and students in the great LGBTQA community, such as a Gay Straight Alliance.**

4. **Student athletes are given preferential treatment because of their gender identity or expression**. (Reverse)

5. **Role models in the community whose gender falls outside of the traditional binary have been invited to speak at my school** (inspired by SCAI; Shindler et al. 2009)**.**

6. **Gender identity does not prevent any student from attending a school dance with another student, such as the prom.**

7. **My school permits transgender students to participate in gender-segregated school activities in accordance with the student's gender identity (For example, think about the school choir, athletics, pep rally activities, prom king/queen contest)** (NJ guide to support Trans students/ Hawaii guide).

STOP HERE for interview prompts

IV. Structures/spaces

1. **Students at my school are allowed to use bathrooms and locker rooms coinciding with their gender identity, rather than birth sex.**

2. **Overall, at my school structure/and spaces are designed to accommodate the needs of transgender and other gender diverse students.**

3**. School media such as posters and newsletters include messages, symbols, or images that facilitate a gender inclusive discourse.**

4. **If structures and spaces do not fit the needs of transgender and other gender diverse students, my school is pro-active to make alternative arrangements for these students** (NJ guide to Trans support in schools).

STOP HERE for interview prompts

Macrosystem (e)

I. Policy

1. **My school follows state and/or regional policy guidelines designed to protect the safety of trans and other gender diverse students** (inspired by Ullman, 2018).

2. **My school follows state and/or regional policy guidelines specifically designed to ensure the gender identity of transgender and other gender diverse students is properly documented, and respected.**

STOP HERE for interview prompts

Pilot 2

Informed Consent Script

Q1 Are you currently enrolled in high school, or a recent high school graduate?

Yes
No

Q2 Which grade level are you in high school? If you are summer recess, enter the grade level you just completed.

8th grade
Freshman
Sophomore
Junior
Senior

Q3 What is your age?

15-17
18-19
Under 15 years old

Age 18-19

Q4 I am a graduate student working on my dissertation under the direction of Professor Carol Lynn Martin, in the T. Denny Sanford School of Social and Family Dynamics at **Arizona State University**. I am conducting a research study to develop a new school climate scale for high school students that focuses on gender.

I am inviting your participation, which will involve the completion of an online self-report survey. In this survey you will be asked to answer multiple choice questions about supports in your high school that promote gender inclusion, equity, and diversity. The survey will take **approximately 25 – 30 minutes.** You have the right not to answer any question, and to stop participation at any time.

Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. All participants will be compensated with a **$1.00 digital donation gift card** at the completion of the study. You will have the choice of different vendors, including *The National Park Foundation* and *The American Red Cross*. To maintain anonymity, the reward delivery process will be linked to a separate Qualtrics form. You must be a **high school student to be eligible to complete** the study. If you are 18-19 years old and have graduated within the past few

months, you are still eligible to participate.

Although there are no direct benefits for participation, your responses will be used to measure the ways high schools can be pro-active to create an environment students of all gender identities can thrive. More specifically, your participation will help us to develop a scale to measure the extent to which US high school acknowledge their own role in creating a safe space that is equitable, inclusive, and diverse.

There are no foreseeable risks or discomforts to your participation. At the same time, we want to make sure you are doing it in a place that is private and in which you feel comfortable. If you have any concerns about completing a survey that might reveal something personal about you (e.g. gender identity) to someone important who doesn't already know, we recommend you complete the survey in a private setting.

To maintain confidentiality after data has been collected, all identifiers (such as your name) will be destroyed. There will be no way to link the data to your name. Your responses will be anonymous.

The results of this study may be used in reports, presentations, or publications but your name will not be used. Furthermore, de-identified data collected as a part of current study will/will not be shared with others (e.g., investigators or industry partners) for future research purposes or other uses.

If you have any questions concerning the research study, please contact the research team at: sscrofan@asu.edu and Carol.Martin@asu.edu. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

By selecting **"I agree"** you are consenting to be apart of this study.

Agree
Disagree

Age 15-17

(Q5 *Gender Affirmative School Climate: A new approach to highlight protection comparing transgender and cisgender high school students*)

My name is Stephan Scrofani. I am a graduate student at Arizona State University. I am working on my dissertation and would like your help.

I am asking you to take part in a research study because I am trying to develop a new school climate scale for high school students that focuses on gender. Your parents' permission is not needed to participate in this study.

If you agree, you will be asked to complete an **online self-report survey**. More specifically, you will be asked to answer multiple choice questions about supports in your high school that promote gender inclusion, equity, and diversity.

 Answering these questions will take about **25 – 30 minutes.** You do not have to answer any questions that make you feel uncomfortable. All participants will be compensated with a **$1.00 digital donation gift card** at the completion of the study. You will have the choice of different vendors, including *The National Park Foundation* and *The Clean Water Fund.* To maintain anonymity, the reward delivery process will be linked to a separate Qualtrics form.

 There are no foreseeable risks or discomforts to your participation. At the same time, we want to make sure you are doing it in a place that is private and in which you feel comfortable**.** If you have any concerns about completing a survey that might reveal something personal about you (e.g. gender identity) to someone important who doesn't already know, we recommend you complete the survey in a private setting.

 You do not have to be in this study. No one will be mad at you if you decide not to do this study. Even if you start the study, you can stop at any time if you wish.

 If you decide to be in the study, I will not tell anyone else how you respond or act as part of the study. Even if your parents ask, I will not tell them about what you say or do in the study.

 By selecting **"I agree"** you are consenting to be apart of this study.

Pilot 2 data collection (overlap with Primary Study script) list of Demographics questions

Demographics

1.) Select which **Gender Identity** you identify with from the dropdown menu.

Cisgender
Transgender
Genderqueer
Intersex
None apply to me, but I am_____.

2.) Select which **Binary Identity (or non-binary identity)** you identify with from the dropdown menu.

Male
Female
Non-Binary
None apply to me, but I am_____.

3.) What is your **Grade level**?

9th (Freshman)
10th (Sophomore)
11th (Junior)
12th (Senior)
Other:_____

4.) What is your **Race**?

White
Black or African American
Asian
American Indian or Alaska Native
Native Hawaiian or Pacific Islander
Two or more races
Unknown

5.) What is your **Ethnicity**?

Hispanic or Latino or Spanish origin
Not Hispanic or Latino or Spanish origin
Unknown

6.) What is your **Sexual orientation**?

Heterosexual
Homosexual
Bisexual
Queer
Asexual
Questioning

7.) What **type of community** is your high school located in?

Urban
Suburban
Rural

8.) Which best characterizes the **type of high school** you are attending? You may select more than one answer choice.

Public
Private
Charter
Magnet
Special Education
Advanced Placement

9.) Enter the approximate **number of students** that attend your high school_____

10.) The **size of my school**, (considering the number of students and professionals), is:

Small
Medium
Large

11.) What is the **gender composition** of your high school?

Co-education
Single sex
Offers both co-education and single sex classes

12.) Select the best response that captures the **ethnic composition of student body**.

Predominately White
Predominately Hispanic or Latino or Spanish Origin
Mix of White and Hispanic or Latino or Spanish Origin
Other_____

13.) Which **city** is your **home residence** located in? _____

14.) Which **state** is you **home residence** located in? _____

15.) Which **city** is your **high school** located in? _____

16.) Which **state** is your **high school** located in? _____

Pilot 2 Script

Gender Affirmative School Climate Scale – GASC Scale Sample Survey with instructions and list of indicators (approx. 60 total proposed; after revisions from the pilot scale development procedure its anticipated that the amount indicators will be reduced):

Q17 *On a Likert scale from 1-7, (**1 Strongly disagree, 2 Disagree, 3 Somewhat Disagree, 4 Neither Agree or Disagree/Neutral, 5 Somewhat Agree, 6 Agree, and 7 Strongly Agree**), please rate the extent to which you agree with the following statements.*

Please take your time to read each question carefully. Some of the questions will ask you about your personal experience at school, while others ask for you to speak to the climate of school spaces and people within. The survey has been designed to assess how both students with cisgender and transgender identities are supported in high school. While this may be the first time you have been asked about how your gender identity is affirmed at school, or the first time you considered the climate of gender at your school, please take a moment to consider each question.

*Throughout the survey, **"This school"** means activities happening in school buildings, on school grounds, on school buses, and at places that hold school-sponsored events or activities. Unless otherwise specified, this refers to normal school hours or to times when school activities/events were in session.*

*Also note, throughout the survey the term **"gender identity"** encompasses cisgender, transgender, and non-binary gender identities who may or may not identify as cisgender or transgender.*

There are no right or wrong answers, please give your best response. **You may skip any question you don't feel comfortable reporting.** Please review the **key of terms** before you begin.

IRB note: scale items for GASC scale will be revised after pilot scale development. Scale subject domain headings will not appear on Qualtrics form.

Key of terms

Cisgender- an individual's assigned sex at birth is aligned with their gender identity

Transgender- an individual declares their gender as something other than what is reflected by the sex marker on their birth certificate. This may include male to female (MTF), female to male (FTM), male to other, or female to other. Moreover, is an umbrella term for binary and non-binary identified transgender people.

Gender diverse identity- Umbrella term for individuals whose gender identity or binary identity departs from prescriptions that exist in society and culture as the norm

Gender equity- refers to promoting fairness in classrooms and the school at large, as well as challenging stereotypes and biases that have historically limited a student's potential.

Gender inclusion- generally refers to the extent to which schools are welcoming to students of all gender identities. Furthermore, inclusion refers to the extent to which services, opportunities, and establishments are open to all people, and challenging the notion that male and female stereotypes do not define social roles and expectations.

Gender privilege- advantages or rights that are available to individuals solely on the basis of their sex, or gender identity.

Gender-related harassment- behaviors and speech that make someone feel bullied because of their actual or perceived gender identity. In many cases, prejudice is motivated by person's perceived lack of fit with gender norms, or may specifically target transgender students (i.e. transphobic harassment). However, prejudice may also be motivated by fitting to gender norms. For example: "She is a sissy" and "He is sissy" both are gender-related harassment.

Transphobia/Trans negativity- A range of attitudes, feelings, and behaviors ranging from the idea that being transgender is less optimal than being cisgender to hatred and disgust toward anyone perceived to diverge from gender expectations.

*For each question **we ask that you drawn upon on your PAST experience in high school, based on your experience in the LAST ACADEMIC YEAR, going back to the start of that academic year in Fall 2021, to Spring 2022.***

***So, drawn upon experiences in your previous school year.** If you were in middle school last year, drawn upon your experiences there.*

Please rate the extent to which you agree with the following statements. (Note: "neither agree or disagree" or "4" is *synonymous with Neutral.)*

Q20 When I'm at school I'm free to live in the gender that feels most real and comfortable.

Q21 At my school students are free to take the lead in <u>expressing</u> their gender, apart from what may be expected of you from traditional norms.

Q22 At my school questioning your gender is considered normal.

Q23 Overall, my school does not restrict, but helps to support my gender identity.

Q24 At my school students of all gender identities feel listened to, represented, and that they have a voice.

Q25 When I'm at school I feel more pressure to conform to traditional gender norms than usual.

Q26 At my school students of different gender identities (i.e. including cisgender, transgender, non-binary identified, etc.) blend, interrelate, and feel like valid members of the community.

Q27 My gender identity does not negatively impact my inclusion in peer groups at school.

Q28 My peers are willing to intervene (to help), when witnessing gender-related and transphobic harassment.

Q29 I have friends at school who I freely talk to about topics that expand the traditional concept of gender, such as <u>gender diversity</u> (for example advocating for non-binary and trans identities) and <u>gender equity</u> (for example, challenging gender roles in the math and sciences or speaking up for school gun violence).

Q30 My peers at school (*including classmates, sports team members, peers from lunch and recess, etc.*) befriend students of all gender identities.

Q31 I find it hard to make close friends at school because of my gender identity.

Q32 Among peers at school I have witnessed comments or behaviors that convey insensitivity, or invalidate the thoughts, feelings, or reality of marginalized gender identities (including cisgender and gender diverse).

Q33 Peers at school have commented or behaved in ways that convey insensitivity, or invalidate my thoughts, feelings, or reality because of my gender identity (cisgender female, transgender, non-binary identified, etc.).

Q34 Selfish-ness and lack of concern for others, are socially destructive within peer groups at my school.

Q35 I feel pressure to maintain traditional gender norms when I'm with peers at school.

Q36 I feel pressure from my peers at school to engage in stereotypical male or female behavior.

Q37 Among peers at school I have witnessed the spreading of rumors or someone being ignored, because of their gender identity (cisgender, transgender, non-binary identified, etc.) or gender expression (i.e. may include clothing, make-up, mannerisms, hair style, etc).

Q38 A peer has spread rumors or ignored me because of my gender identity (cisgender, transgender, non-binary identified, etc.) or gender expression (i.e may include clothing, make-up, mannerisms, hair style, etc.).

Q39 Among peers at my school I have witnessed gendered "name calling" that is derogatory because of a someone's <u>gender identity</u> or <u>gender expression</u>.

Q40 I have been the victim of gendered "name calling" that is derogatory because of my <u>gender identity</u> or <u>gender expression</u>.

Q41 Among peers at my school I have witnessed threats to physically hurt someone because of their gender identity or gender expression.

Q42 A peer has threatened to physically hurt me because of my gender identity or expression.

Q43 Teachers and other staff at school support me in my gender identity (cisgender, transgender, non-binary identified, etc.).

Q44 My gender identity (i.e. cisgender, transgender, non-binary identified, etc.) impacts the extent to which teachers/and other staff include me in activities and call on me to participate.

Q45 My teachers and other staff are willing to intervene (to help), when witnessing gender-related and transphobic harassment.

Q46 Teachers and other staff freely talk about topics that expand the traditional concept of gender, such as diversity (i.e. gender diverse identities) and equity (i.e. challenging the idea that males belong math and science fields) .

Q47 Teachers and other staff at my school don't give preferential treatment to students because of their <u>gender identity</u> (i.e. cisgender, transgender, non-binary identified, etc.) and/or <u>gender expression</u> (i.e. may include clothing, make-up, mannerisms, hair style, etc.).

Q48 I find it hard to have close relationships with teachers and other staff at my school because of my gender identity.

Q49 Teachers and other staff have a collective sense of responsibility in creating a space for students of all genders (i.e. cisgender, transgender, and non-binary identified, etc.) to learn and thrive.

Q50 I feel comfortable reporting gender-related bullying or harassment to teachers and other staff without fear that their own gender biases or opinions would prevent the issue from being heard, or taken seriously.

Q51 At my school, gender identity (cisgender, transgender and non-binary identified) impacts how severely a student is perceived when breaking school guidelines.

Q52 Teachers at my school take initiative to teach students about proper pronoun usage related to gender identities.

Q53 I feel pressure to maintain traditional gender norms when I'm with teachers and other professionals at school.

Q54 I feel pressure from teachers and other professionals at school to engage in stereotypical male or female behavior.

Q55 Teachers and other professionals at my school focus on discouraging the organization of students by gender in and out of the classroom (such as: single-sex classes, separating gym classes by gender, teacher seating arrangement by gender, etc.).

Q56 My school runs community or after school events which focus on educating about gender equity (i.e. reproductive rights for women, resistance of toxic masculinities such as school gun violence, challenging gender roles in the math and sciences), and are designed to connect students with an extended social network, including their families.

Q57 My school runs community or after school events which focus on educating about gender diversity (i.e. may include rights for transgender and non-binary identies), and are designed to connect students with an extended social network, including their families.

Q58 The actions of families in the greater community, such as involvement in political activism or fundraising, has helped my school's commitment to advocating for gender equity (i.e. such as reproductive rights for women, resistance of toxic masculinities such as school gun violence, and challenging gender roles in math and sciences).

Q59 My school provides trans and other gender diverse students equal access to educational programs and activities, even in circumstances in which parents raise objections or concerns.

Q60 My school sends out at least one notice to parents (including e-mails, letters, bulletins, online newsletters, etc.) informing them of the rights of transgender and other gender diverse identities in school spaces.

Q61 My school has a sense of a vision, or mission that focuses on expanding the understanding of gender.

Q62 Regardless of the visibility of transgender and other gender diverse students, my school is pro-active in creating a safe space for transgender and gender diverse students.

Q63 My school has a sense of a vision, or a mission that focuses on creating a social discourse where gender hierarchies are not maintained, such as working against the notion that the values aligned with a westernized ideal of masculinity should be dominant.

Q64 My school is proactive to initiate a culture in which all students (i.e. cisgender, transgender, non-binary identified, etc.) have the ability to live in the gender that feels most real and comfortable to them, and to express that gender with freedom from restriction and rejection.

Q65 The curriculum at my school challenges gender privilege through expansive curricula (within and across subject domains such as history and science) and approaches to teaching, such as by educating on why the belief that men belong in the math and sciences came to exist.

Q66 The curriculum at my school challenges traditional gender stereotypes through expansive curricula (within and across subject domains such as history and science) and approaches to teaching, by covering why gender stereotypes exist, and deconstructing their connection to social norms.

Q67 My school curriculum is inclusive and sensitive to current social issues centering around gender diversity, such as advocating for the rights of transgender youth.

Q68 I have learned about transgender and other gender diverse role models at my school.

Q69 The curriculum on adolescent health and development at my school explains the difference between biological sex and gender identity.

Q70 The curriculum on adolescent health and development at my school is inclusive to the identities and experiences gender diverse youth.

Q71 The curriculum at my school teaches about biology and human bodies in ways that does not reinforce a traditional gender binary, such as including education on intersex people.

Q72 My school has a space for transgender and other gender diverse athletes, on mixed gender sport leagues and/or by allowing transgender athletes to participate on single sex sports teams based on their gender identity, rather than birth sex.

Q73 My school has a social support group/s designed to create an alliance between cisgender and students in the great LGBTQIA+ community, such as a Gay Straight Alliance (GSA).

Q74 Student athletes are given preferential treatment because of their gender expression or presentation (i.e. may include make-up, clothing, mannerisms, etc.).

Q75 Role models in the community whose gender falls outside of the traditional binary have been invited to speak at my school.

Q76 <u>Gender identity</u> and/or <u>gender expression</u> does not prevent any student from attending a school dance with another student, such as the prom.

Q77 My school permits transgender and other gender diverse students to participate in gender-segregated school activities in accordance with the student's gender identity (For example, think about the school choir, pep rally activities, prom king/queen contest, etc.).

Q78 Students at my school are allowed to use bathrooms and locker rooms coinciding with their gender identity, rather than birth sex.

Q79 My schools code of conduct guidelines for dress code do not prevent students from wearing clothing or accessories because of their <u>gender identity</u> and/or <u>gender expression</u>.

Q80 School media such as posters on walls or newsletters (online or paper) include messages, symbols, or images which promote <u>gender equity</u> (i.e. such as reproductive rights for women, resistance of toxic masculinities such as school gun violence, challenging gender roles in academic subject domains and career paths).

Q81 School media such as posters on walls and newsletters (online or paper) include messages, symbols, or images which promote <u>gender inclusion</u> (i.e. such as advocating for girls to pursue careers in the math and sciences and using gender inclusive language).

Q82 If structures and spaces do not fit the needs of transgender and other gender diverse students, my school is pro-active to make alternative arrangements for these students.

Primary Study – Informed Consent

Q1 Are you currently enrolled in high school?

Yes
No

Q2 Which grade level are you in high school?
8th grade
Freshman
Sophomore
Junior
Senior

Q3 What is your age?

15-17
18-19
Under 15 years old

Age 18-19

Q4 I am a graduate student working on my dissertation under the direction of Professor Carol Lynn Martin, in the T. Denny Sanford School of Social and Family Dynamics at **Arizona State University**. I am conducting a research study to help to highlight school efforts which promote school climate, with a specific focus on gender. In addition, this research project investigates how school supports relate to student wellness outcomes. **If you were a participant in the pilot data collection, you are still eligible to participate.**

 I am inviting your participation, which will involve the completion of an online self-report survey. In this survey you will be asked to answer multiple choice questions about supports in your high school that promote gender inclusion, equity, and diversity. In addition, you will answer multiple choice questions about how you feel when you are at school, such as if you feel like you belong. Some participants may be asked short answer questions at the conclusion of the survey. The survey will take **approximately 30 - 45 min.** You have the right not to answer any question, and to stop participation at any time.

 Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. All participants will be compensated with a **$1.00 digital donation gift card** at the completion of the study. You will have the choice of 6 different vendors, including *The National Park Foundation* and *The American Red Cross*. **If you choose to, you will be entered in a raffle to win a 20.00 gift card.**To maintain anonymity, the reward delivery process will be linked to a separate Qualtrics form. You must be a **high school student to be eligible to complete** the study. If you are 18-19 years old and have graduated within the past few weeks, you

are still eligible to participate.

Although there are no direct benefits for participation, your responses will be used to measure the ways high schools can be pro-active to create an environment students of all gender identities can thrive. In addition, your participation will help us to develop a scale to measure the extent to which US high school acknowledge their own role in creating a safe space that is equitable, inclusive, and diverse.

There are no foreseeable risks or discomforts to your participation. At the same time, we want to make sure you are doing it in a place that is private and in which you feel comfortable. If you have any concerns about completing a survey that might reveal something personal about you (e.g. gender identity) to someone important who doesn't already know, we recommend you complete the survey in a private setting.

To maintain confidentiality after data has been collected, all identifiers (such as your name) will be destroyed. There will be no way to link the data to your name. Your responses will be anonymous.

The results of this study may be used in reports, presentations, or publications but your name will not be used. Furthermore, de-identified data collected as a part of current study will/will not be shared with others (e.g., investigators or industry partners) for future research purposes or other uses.

If you have any questions concerning the research study, please contact the research team at: sscrofan@asu.edu and Carol.Martin@asu.edu. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

By selecting **"I agree"** you are consenting to be apart of this study.

Agree
Disagree

<center>Age 15-17</center>

My name is Stephan Scrofani. I am a graduate student at Arizona State University. I am working on my dissertation and would like your help.

I am asking you to take part in a research study to help to highlight high school efforts which promote school climate, specifically focusing on gender. In addition, this research project investigates how school supports relate to student wellness outcomes. Your parents' permission is not needed to participate in this study. If you were a participant in the pilot data collection, you are still eligible to participate.

If you agree, you will be asked to complete an online self-report survey. More specifically, you will be asked to answer multiple choice questions about supports in your high school that promote gender inclusion, equity, and diversity. In addition, you will answer multiple choice questions about how you feel when you are at school, such as if you feel like you belong. Some participants may be asked short answer questions at the conclusion of the survey.

Answering these questions will take about 30 – 45 min. You do not have to answer any questions that make you feel uncomfortable. All participants will be compensated with a $1.00 digital donation gift card at the completion of the study. You will have the choice of 6 different vendors, including The National Park Foundation and The Clean Water Fund. If you choose to, you will be entered in a raffle to win a 20.00 gift card. To maintain anonymity, the reward delivery process will be linked to a separate Qualtrics form.

There are no foreseeable risks or discomforts to your participation. At the same time, we want to make sure you are doing it in a place that is private and in which you feel comfortable. If you have any concerns about completing a survey that might reveal something personal about you (e.g. gender identity) to someone important who doesn't already know, we recommend you complete the survey in a private setting.

You do not have to be in this study. No one will be mad at you if you decide not to do this study. Even if you start the study, you can stop at any time if you wish.

If you decide to be in the study, I will not tell anyone else how you respond or act as part of the study. Even if your parents ask, I will not tell them about what you say or do in the study.

By selecting "I agree" you are consenting to be apart of this study.

Agree
Disagree

Primary Study Demographics

See list from pilot 2 study.

Primary Study - Gender Affirmative School Climate

Q18 *On a Likert scale from 1-7, (**1 Strongly disagree, 2 Disagree, 3 Somewhat Disagree, 4 Neither Agree or Disagree/Neutral, 5 Somewhat Agree, 6 Agree, and 7 Strongly Agree**), please rate the extent to which you agree with the following statements.*

 Please take your time to read each question carefully. Some of the questions will ask you about your personal experience at school, while others ask for you to speak to the climate of school spaces and people within. The survey has been designed to assess how both students with cisgender and transgender identities are supported in high school. While this may be the first time you have been asked about how your gender identity is affirmed at school, or the first time you considered the climate of gender at your school, please take a moment to consider each question.

 *Throughout the survey, **"This school"** means activities happening in school buildings, on school grounds, on school buses, and at places that hold school-sponsored events or activities. Unless otherwise specified, this refers to normal school hours or to times when school activities/events were in session.*

 *Also note, throughout the survey the term **"gender identity"** encompasses cisgender, transgender, and non-binary gender identities who may or may not identify as cisgender or transgender.*

 There are no right or wrong answers, please give your best response. **You may skip any question you don't feel comfortable reporting.** Please review the **key of terms** before you begin.

(Key of terms shown next; see Pilot 2 key of terms list)

Q19b
*For each question **we ask that you drawn upon on your CURRENT experience in high school, based on your experience NOW, going back to the start of the academic year, Fall 2022 to Spring 2023.***

So, drawn upon experiences now going back to August or September 2022, at the start of your school year.

Please rate the extent to which you agree with the following statements. (Note: "neither agree or disagree" or "4" is *synonymous with Neutral.*

Q20 When I'm at school I'm free to live in the gender that feels most real and comfortable.

Q21 At my school students are free to take the lead in <u>expressing</u> their gender, apart from what may be expected of you from traditional norms.

Q22 At my school questioning your gender is considered normal.

Q23 Overall, my school does not restrict, but helps to support my gender identity.

Q24 At my school students of all gender identities feel listened to, represented, and that they have a voice.

Q25 When I'm at school I feel more pressure to conform to traditional gender norms than usual.

Q26 At my school students of different gender identities (i.e. including cisgender, transgender, non-binary identified, etc.) blend, interrelate, and feel like valid members of the community.

Q28 My peers are willing to intervene (to help), when witnessing gender-related and transphobic harassment.

Q29 I have friends at school who I freely talk to about topics that expand the traditional concept of gender, such as <u>gender diversity</u> (for example advocating for non-binary and trans identities) and <u>gender equity</u> (for example, challenging gender roles in the math and sciences or speaking up for school gun violence).

Q32 Among peers at school I have witnessed comments or behaviors that convey insensitivity, or invalidate the thoughts, feelings, or reality of marginalized gender identities (including cisgender and gender diverse).

Q33 Peers at school have commented or behaved in ways that convey insensitivity, or invalidate my thoughts, feelings, or reality because of my gender identity (cisgender female, transgender, non-binary identified, etc.).

Q35 I feel pressure to maintain traditional gender norms when I'm with peers at school.

Q36 I feel pressure from my peers at school to engage in stereotypical male or female behavior.

Q37 Among peers at school I have witnessed the spreading of rumors or someone being ignored, because of their gender identity (cisgender, transgender, non-binary identified, etc.) or gender expression (i.e. may include clothing, make-up, mannerisms, hair style, etc).

Q38 A peer has spread rumors or ignored me because of my gender identity (cisgender, transgender, non-binary identified, etc.) or gender expression (i.e may include clothing, make-up, mannerisms, hair style, etc.).

Q39 Among peers at my school I have witnessed gendered "name calling" that is derogatory because of a someone's gender identity or gender expression.

Q40 I have been the victim of gendered "name calling" that is derogatory because of my gender identity or gender expression.

Q41 Among peers at my school I have witnessed threats to physically hurt someone because of their gender identity or gender expression.

Q42 A peer has threatened to physically hurt me because of my gender identity or expression.

Q43 Teachers and other staff at school support me in my gender identity (cisgender, transgender, non-binary identified, etc.).

Q45 My teachers and other staff are willing to intervene (to help), when witnessing gender-related and transphobic harassment.

Q46 Teachers and other staff freely talk about topics that expand the traditional concept of gender, such as diversity (i.e. gender diverse identities) and equity (i.e. challenging the idea that males belong math and science fields) .

Q49 Teachers and other staff have a collective sense of responsibility in creating a space for students of all genders (i.e. cisgender, transgender, and non-binary identified, etc.) to learn and thrive.

Q50 I feel comfortable reporting gender-related bullying or harassment to teachers and other staff without fear that their own gender biases or opinions would prevent the issue from being heard, or taken seriously.

Q52 Teachers at my school take initiative to teach students about proper pronoun usage related to gender identities.

Q53 I feel pressure to maintain traditional gender norms when I'm with teachers and other professionals at school.

Q54 I feel pressure from teachers and other professionals at school to engage in stereotypical male or female behavior.

Q56 My school runs community or after school events which focus on educating about gender equity (i.e. reproductive rights for women, resistance of toxic masculinities such as school gun violence, challenging gender roles in the math and sciences), and are designed to connect students with an extended social network, including their families.

Q57 My school runs community or after school events which focus on educating about gender diversity (i.e. may include rights for transgender and non-binary identies), and are designed to connect students with an extended social network, including their families.

Q58 The actions of families in the greater community, such as involvement in political activism or fundraising, has helped my school's commitment to advocating for gender equity (i.e. such as reproductive rights for women, resistance of toxic masculinities such as school gun violence, and challenging gender roles in math and sciences).

Q59 My school provides trans and other gender diverse students equal access to educational programs and activities, even in circumstances in which parents raise objections or concerns.

Q60 My school sends out at least one notice to parents (including e-mails, letters, bulletins, online newsletters, etc.) informing them of the rights of transgender and other gender diverse identities in school spaces.

Q61 My school has a sense of a vision, or mission that focuses on expanding the understanding of gender.

Q62 Regardless of the visibility of transgender and other gender diverse students, my school is pro-active in creating a safe space for transgender and gender diverse students.

Q63 My school has a sense of a vision, or a mission that focuses on creating a social discourse where gender hierarchies are not maintained, such as working against the notion that the values aligned with a westernized ideal of masculinity should be dominant.

Q64 My school is proactive to initiate a culture in which all students (i.e. cisgender, transgender, non-binary identified, etc.) have the ability to live in the gender that feels most real and comfortable to them, and to express that gender with freedom from restriction and rejection.

Q65 The curriculum at my school challenges gender privilege through expansive curricula (within and across subject domains such as history and science) and approaches to teaching, such as by educating on why the belief that men belong in the math and sciences came to exist.

Q66 The curriculum at my school challenges traditional gender stereotypes through expansive curricula (within and across subject domains such as history and science) and approaches to teaching, by covering why gender stereotypes exist, and deconstructing their connection to social norms.

Q67 My school curriculum is inclusive and sensitive to current social issues centering around gender diversity, such as advocating for the rights of transgender youth.

Q68 I have learned about transgender and other gender diverse role models at my school.

Q69 The curriculum on adolescent health and development at my school explains the difference between biological sex and gender identity.

Q70 The curriculum on adolescent health and development at my school is inclusive to the identities and experiences gender diverse youth.

Q71 The curriculum at my school teaches about biology and human bodies in ways that does not reinforce a traditional gender binary, such as including education on intersex people.

Q72 My school has a space for transgender and other gender diverse athletes, on mixed gender sport leagues and/or by allowing transgender athletes to participate on single sex sports teams based on their gender identity, rather than birth sex.

Q73 My school has a social support group/s designed to create an alliance between cisgender and students in the great LGBTQIA+ community, such as a Gay Straight Alliance (GSA).

Q75 Role models in the community whose gender falls outside of the traditional binary have been invited to speak at my school.

Q76 Gender identity and/or gender expression does not prevent any student from attending a school dance with another student, such as the prom.

Q77 My school permits transgender and other gender diverse students to participate in gender-segregated school activities in accordance with the student's gender identity (For example, think about the school choir, pep rally activities, prom king/queen contest, etc.).

Q78 Students at my school are allowed to use bathrooms and locker rooms coinciding with their gender identity, rather than birth sex.

Q79 My schools code of conduct guidelines for dress code do not prevent students from wearing clothing or accessories because of their <u>gender identity</u> and/or <u>gender expression</u>.

Q80 School media such as posters on walls or newsletters (online or paper) include messages, symbols, or images which promote <u>gender equity</u> (i.e. such as reproductive rights for women, resistance of toxic masculinities such as school gun violence, challenging gender roles in academic subject domains and career paths).

Q81 School media such as posters on walls and newsletters (online or paper) include messages, symbols, or images which promote <u>gender inclusion</u> (i.e. such as advocating for girls to pursue careers in the math and sciences and using gender inclusive language).

Q82 If structures and spaces do not fit the needs of transgender and other gender diverse students, my school is pro-active to make alternative arrangements for these students.

Q83a For the following questions, **please indicate the extent to which each statement is true**. There are no right or wrong answers.

School Belonging

Psychological Sense of School Membership Scale (PSSM) (Goodenow, 1993)

(5-point Likert scale ranging from 1 = Not at all true - 5 = Completely true)

1. I feel like a part of my school.

2. People at my school notice when I am good at something.

3. It is hard for people like me to be accepted at my school.

4. Other students in my school take my opinions seriously.

5. Most teachers at my school are interested in me.

6. Sometimes I feel as if I don't belong in my school.

7. There is at least one teacher or adult I can talk to in my school if I have a problem.

8. People at my school are friendly to me.

9. Teachers here are not interested in people like me.

10. I am included in lots of activities at my school.

11. I am treated with as much respect as other students in my school.

12. I feel very different from most other students at my school.

13. I can really be myself at my school.

14. Teachers at my school respect me.

15. People at my school know that I can do good work.

16. I wish I were in a different school.

17. I feel proud to belong to my school.

18. Other students at my school like me the way that I am.

Q101a The next set of questions ask you **how you feel about yourself**. Please answer each question. Remember there is no right or wrong answer.

Self-esteem

The Adolescent Self-Esteem Questionnaire (ASQ) (Hafekost et al., 2015)

(5-point Likert scale ranging from 1 = Almost all of the time- 5 = Hardly ever)

1. I am able to stand up for myself and what I believe in.

2. How I feel about myself depends on what others think of me.

3. I feel I can be myself around other people.

4. Overall, I feel good about my abilities compared to others (e.g. at school, playing sports, or socially).

5. If I make an innocent mistake I let it get me down.

6. I feel useless.

(5-point Likert scale ranging from 1 = Strongly Agree – 5 = Strongly Disagree)

7. Overall I like who I am.

8. I am a good person who has a lot to offer.

9. I feel that I am a valuable person who is at least equal to other people.

10. How I feel about my body makes me feel less confident

11. I feel confident in my abilities to achieve the things I set my mind to.

12. I think other people like me.

Q113a For each of the following **activities**, indicate in the multiple choice response **whether in the last year**, you never did this activity, you did this once or twice, you did this a few times, you did this a fair bit, or you did this activity a lot.

Activism

Youth Inventory of Involvement (YII) scale (Pancer et al., 2007); Scale questions taken from Lyons (2005); also listed in Leviss (2020)

For each of these activities, please use the following scale to indicate whether, in the last year, 0 = you never did this, 1 = you did this once or twice, 2 = you did this a few times, 3 = you did this a fair bit, 4 = you did this a lot.

1. Visited or helped out people who were sick.

2. Took care of other families children (on an unpaid basis).

3. Participated in a group connected to a place of worship or in a religious organization or club.

4. Participated in or helped a charity organization.

5. Participated in an ethnic club or organization.

6. Participated in a political party, club, or organization.

7. Helped with a fund-raising project.

8. Helped organize neighborhood or community events (including carnivals, potluck dinners, etc.)

9. Helped prepare and make verbal and written presentations to organization, agencies, conferences, or politicians.

10. Did things to help improve your neighborhood (ex. helped clean up a local playground).

11. Gave help (including money, food, clothing, rides, etc.) to friends or classmates who needed it.

12. Served as a member of an organizing committee or board for a school club or organization.

13. Wrote a letter to a school or community newspaper or publication.

14. Signed a petition.

15. Attended a demonstration.

16. Collected signatures for a petition drive.

17. Contacted a public official (by phone or mail) to tell him/her how you felt about a particular issue.

18. Joined in a protest march, meeting or demonstration.

19. Got information about community activities from a local community information center.

20. Volunteered at a school event or function.

21. Helped people who were new to your country.

22. Gave money to a cause.

23. Worked on a political campaign.

24. Ran for a position in student government.

25. Participated in a discussion about a social or political issue.

26. Volunteered with a community service organization.

27. Participated in a social or cultural group or organization

28. Participated in a school academic club or team.

29. Participated in a sports team or club.

30. Led or helped out with a children's group or club.

Q137 The following questions are about **how you have felt (in the last 3 months) about being transgender**. Please indicate to what extent you agree/disagree.

Internalized Transphobia

*Transgender Identity Scale (TSI) – Shame sub-scale (Bockting et al., 2019)
(specific to transgender identified participants**)

"The following questions are about how you have felt in the last 3 months about being trans- gender. Please indicate to what extent you agree/disagree''. Items are scored so that higher scores reflect more transphobic, negative attitudes (Bockting et al., 2019).

The Likert scale ranges from 1-7, from (1) strongly disagree to (7) strongly agree.

1. I sometimes resent my transgender identity

2. Being transgender makes me feel like a freak.

3. When I think of being TG, I feel depressed.

4. When I think of being TG, I feel unhappy.

5. Often I feel weird, like an outcast or a pervert.

6. I often ask myself: Why can't I just be normal?

7. I sometimes feel that being TG is embarrassing.

8. I envy people who are not transgender.

Transgender Identity Scale – Pride sub-scale (Bockting et al., 2019)
(specific to transgender identified participants**)

"The following questions are about how you have felt in the last 3 months about being trans- gender. Please indicate to what extent you agree/disagree''. Items are scored so that higher scores reflect more transphobic, negative attitudes (Bockting et al., 2019).

The Likert scale ranges from 1-7, from (1) strongly disagree to (7) strongly agree.

1. Being TG makes me feel special and unique.

2. Being perceived by others as TG is okay for me.

3. I have no problem talking about my TG identity.

4. Being transgender is a gift.

5. I am like other people but I am also special.

6. I am proud to be a transgender person.

7. I am comfortable revealing to others that I am TG.

8. I'd rather have people know everything and accept me as transgender.

Q154 In the following four questions, please report the extent to which **you feel similar to other peers based on their binary (gender) identity**.

Similarity to Peer Group Gender (Binary-based)

Similarity to Peer Group Gender – Binary based (Martin et al. 2017)

On a scale of 0-4, report the extent to which you feel similar to other peers based on their binary (gender) identity (0 =not similar at all, 1 = a little similar, 2 = somewhat similar, 3 = moderately similar, 4 = extremely similar).

1. How similar do you feel to peers who identify as girls?

2. How similar do you feel to peers who identify as boys?

3. How similar do you feel to peer who identify as non-binary identified?

4. Are there other peer groups that you feel similar to? Please list these.

Q160 For each short answer question, **please comment on your cumulative experience in high school, based on your experience now, going back to the start of high school**. You may skip these questions if you are short on time, or write a brief response.

*Short answer questions – **specific to Transgender sub-sample*****

Survey Instructions: *For each question, please comment on your cumulative experience in high school, based on your experience now, going back to the start of high school.*

Part I.

1. Take a moment to reflect on the self-report survey that you took. Speaking to your experience of support, as well as challenges in finding support as a transgender student, do you have **any initial reactions** that you find important to report?

2. Do you think your experiences at school have informed your self-esteem? Why or why not?

3. Do you think your experiences at school have informed your **sense of belonging** (i.e. how you fit in at your high school)? Why or why not?

4. Have you **"come out"** to any one at school as Transgender (including peers and staff)?

Part II. Next questions will appear only if participant answers yes to this question: **Have you come out to any one at school as Transgender?**

1. Do you have peers at school who have celebrated your coming out story?

2. Do you have supportive faculty at school who have celebrated your coming out story?

3. Did at least one school professional take the lead to communicate with your family to create a partnership advocating support for your gender identity?

      3b. If not, was there an intermediary professional, such as your therapist, who reached out   to the school to create a partnership advocating for the school to support you in your   gender identity?

4. When a student discloses a gender diverse identity at your school, are staff sensitive to balance issues of confidentiality with parents, with social support in school spaces?

Analyses Output (G*Power)

Pilot Study – Sample estimation based on .80 probability there is sufficient power to reject null hypothesis (ρ2=.15, α < .05)

[10] -- Tuesday, March 15, 2022 -- 16:19:39
F tests - Linear multiple regression: Fixed model, R²
deviation from zero

Analysis: A priori: Compute required sample size
Input: Effect size f²   =   0.1764706
              α err prob   =   0.05
              Power (1-β err prob)   =   0.8
              Number of predictors   =   30
Output: Noncentrality parameter λ   =   28.7647078
              Critical F   =   1.5457197
              Numerator df   =   30
              Denominator df   =   132
              Total sample size   =   163
              Actual power   =   0.8031281

Primary Study – Sample estimation based on .80 probability there is sufficient power to reject null hypothesis (ρ2=.15, α < .05)

[3] -- Tuesday, March 15, 2022 -- 20:01:47
F tests - Linear multiple regression: Fixed model, R²
deviation from zero

Analysis: A priori: Compute required sample size
Input: Effect size f²   =   0.1764706
              α err prob   =   0.05
              Power (1-β err prob)   =   0.80
              Number of predictors   =   101
Output: Noncentrality parameter λ   =   52.9411800
              Critical F   =   1.3203271
              Numerator df   =   101
              Denominator df   =   198
              Total sample size   =   300
              Actual power   =   0.8003251

APPENDIX E

IRB APPROVAL

APPROVAL: EXPEDITED REVIEW

Carol Martin
CLAS-SS: Social and Family Dynamics, T. Denny Sanford School of (SSFD)
480/965-5861
cmartin@asu.edu

Dear Carol Martin:

On 4/18/2022 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Gender Affirmative School Climate: A new approach to highlight protection comparing transgender and cisgender high school students
Investigator:	Carol Martin
IRB ID:	STUDY00015833
Category of review:	
Funding:	Name: ASU: ASU Research Enterprise (ASURE)
Grant Title:	
Grant ID:	
Documents Reviewed:	• Assent Cognitive Interview, Category: Consent Form; • Assent Pilot Self Report, Category: Consent Form; • Assent Primary Study, Category: Consent Form; • Cognitive Interview Script, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Completion Fellowship 2022-2023, Category: Sponsor Attachment; • Consent Cognitive Interview, Category: Consent Form; • Consent Pilot Self-Report Survey, Category: Consent Form; • Consent Primary Study, Category: Consent Form; • IRB Social Behavioral Protocol S.Scrofani UPDATE, Category: IRB Protocol; • Pilot Phase 2 - Self-Report Survey Script, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Primary Study Survey - Cisgender, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Primary Study Survey - Transgender, Category: Measures (Survey questions/Interview questions /interview guides/focus

Page 1 of 2

	group questions); • Social Media Cognitive Interview - Cisgender, Category: Recruitment Materials; • Social Media Cognitive Interview - Transgender, Category: Recruitment Materials; • Social Media Pilot Self Report - Cisgender, Category: Recruitment Materials; • Social Media Pilot Self Report - Transgender, Category: Recruitment Materials; • Social Media Primary Study - Cisgender, Category: Recruitment Materials; • Social Media Primary Study - Transgender, Category: Recruitment Materials;

The IRB approved the protocol from 4/18/2022 to 4/17/2023 inclusive. Three weeks before 4/17/2023 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 4/17/2023 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

REMINDER - - Effective January 12, 2022, in-person interactions with human subjects require adherence to all current policies for ASU faculty, staff, students and visitors. Up-to-date information regarding ASU's COVID-19 Management Strategy can be found here. IRB approval is related to the research activity involving human subjects, all other protocols related to COVID-19 management including face coverings, health checks, facility access, etc. are governed by current ASU policy.

Sincerely,

IRB Administrator