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DISORDERED EATING IN GENDER MINORITY ADULTS:
AN EVALUATION AND INTEGRATION OF THE GENDER MINORITY STRESS
AND RESILIENCE MODEL AND THE TRIPARTITE INFLUENCE MODEL

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Master of Arts

by

Laura Muratore

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DISORDERED EATING IN GENDER MINORITY ADULTS:
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by

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SAN JOSÉ STATE UNIVERSITY

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ABSTRACT

DISORDERED EATING IN GENDER MINORITY ADULTS:
AN EVALUATION AND INTEGRATION OF THE GENDER MINORITY STRESS
AND RESILIENCE MODEL AND THE TRIPARTITE INFLUENCE MODEL

by Laura Muratore

Gender minority individuals experience elevated rates of body dissatisfaction and disordered eating in comparison to cisgender individuals; however, research assessing why this health disparity exists is limited. To address this gap, the present study investigated gender minority stress and resilience factors as proposed in the gender minority stress and resilience model (GMSR), sociocultural influence factors as proposed in the tripartite influence model of body dissatisfaction and disordered eating (TI), and an integration of these two theoretical frameworks in efforts to better explain disordered eating etiology for gender minority individuals. Results of regression analyses demonstrated that the integration of GMSR and TI model factors better explained disordered eating experiences compared to the GMSR model alone. As well, the majority of relationships observed between model factors and disordered eating were as expected; however, the role of gender identity pride deviated from theory. Unexpectedly, body dissatisfaction showed no significant relationship with disordered eating and was not well explained by the TI model, although the integrated TI and GMSR model showed adequate explanatory power. Results provide evidence supporting the application and integration of the two models in understanding disordered eating and body dissatisfaction experiences among gender minority people.

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Introduction

Eating disorders represent clinically significant levels of disordered eating thoughts and behaviors and are characterized as the "persistent disturbance of eating or eating-related behavior that results in the altered consumption or absorption of food and that significantly impairs physical health or psychosocial function" (American Psychiatric Association [APA], 2013, p. 329). Among women, lifetime prevalence rates for anorexia nervosa, bulimia nervosa, and binge-eating disorder are .9%, 1.5%, and 3.5%, respectively, and among men are .3%, .5%, and 2% (Hudson, Hiripi, Pope, & Kessler, 2007). The nature of disordered eating psychopathology differs among the different eating disorder diagnoses as defined in the current version of the Diagnostic and Statistical Manual (DSM-5; APA, 2013). The DSM describes three main eating disorders: anorexia nervosa, bulimia nervosa, and binge-eating disorder. Anorexia nervosa is characterized by significantly low body weight that is accompanied by fears of weight gain and body image disturbances. Bulimia nervosa is characterized by repeated binge eating and compensatory calorie-expending behaviors (e.g., excessive exercise), but does not necessary result in significantly low body weight. Lastly, binge-eating disorder is typified by recurrent episodes of binge eating without compensatory behaviors.

Complications associated with disordered eating and eating disorders are serious and can be life-threatening. Eating disorders are chronic, typically do not remit without treatment, and demonstrate the highest mortality rates of all mental health disorders (Arcelus, Mitchell, Wales, & Nielsen, 2011; Steinhausen, 2009). Additionally, many

negative impairments have been associated with disordered eating psychopathology. These include: increased risk of suicide (Crow et al., 2009), poor quality of life (Wade, Wilksch, & Lee, 2012), and other psychiatric comorbidities such as depressive and anxiety disorders (APA, 2013).

Gender minority individuals (GMIs) are persons whose gender identities do not align with the sex they were assigned at birth and may identify as transgender, genderqueer, gender non-binary, two-spirit, cross-dresser, or with other identities that indicate a difference between one's sex assigned at birth and one's felt gender. GMIs compose an estimated 0.6% of the United States population and face significant discrimination, rejection, and stigma on both interpersonal and institutional levels (Flores, Herman, Gates, & Brown, 2016; James et al., 2016). Furthermore, GMIs are at higher risk of developing mental health related problems including suicidal ideation (Testa et al., 2017a), depression (Reisner et al., 2016), anxiety (Smalley, Warren, & Barefoot, 2018), disordered eating (Witcomb et al., 2015), and body dissatisfaction (Jones, Haycraft, Murjan, & Arcelus, 2016) than cisgender individuals, persons whose gender identity is the same as the sex they were assigned at birth. For example, in a nationwide sample of college students, researchers reported that GMIs were more likely to report an eating disorder diagnosis, diet pill use, and vomiting or laxative use in comparison to their cisgender peers (Diemer, Grant, Munn-Chernoff, Patterson, & Duncan, 2015). This health disparity in disordered eating psychopathology has also been observed for gender minority adolescents (Guss, Williams, Resiner, Austin, & Katz-Wise, 2017).

In sum, research suggests that disordered eating is a problem for GMIs; however, our empirical understanding of disordered eating psychopathology is limited. Few studies have evaluated factors that influence the development and maintenance of disordered eating among GMIs (Jones et al., 2016). To address this literature gap, the present study utilizes two previously established theoretical models in efforts to better understand disordered eating psychopathology for GMIs.

Theoretical frameworks can be employed in research to help researchers investigate biopsychosocial processes underlying mental health experiences. Researchers can utilize existing general theories, population-specific theories, or a combination of both theoretical approaches to help better understand why GMIs experience mental health related problems (Testa et al., 2017a). Utilizing these theoretical approaches, the current study aims to evaluate a gender minority-specific theoretical model (the gender minority stress and resilience model; Hendricks & Testa, 2012; Testa et al., 2015) and the model's integration with a prominent general theoretical model for disordered eating etiology (the tripartite influence model of body dissatisfaction and disordered eating; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999; Tylka, 2011) in efforts to better understand disordered eating among GMIs.

Eating Disorder Symptomology and Related Constructs

Body dissatisfaction, the negative self-appraisal of one's physical appearance, has been identified as a risk factor in the development of disordered eating for GMIs (Jones et al., 2018) and cisgender individuals (Stice & Shaw, 2002). In a recent literature review, Jones et al. (2016) found support for the connection between disordered eating and body

dissatisfaction concluding that body dissatisfaction may put GMIs at risk for developing disordered eating. Their review also found evidence in support of a buffering effect of gender-affirming medical interventions (i.e., hormonal therapies and gender-affirming surgeries which work to align the physical body with an individual's gender identity). Specifically, gender-affirming medical interventions have been associated with increased body satisfaction (Kraemer, Delsignore, Schnyder, & Hepp, 2008) and lower levels of eating disorder symptomology (Testa, Rider, Haug, & Balsam, 2017b).

In studies of the general population, gender has been identified as an important factor in relation to disordered eating development with research demonstrating cisgender women, persons assigned female sex at birth and who identify as female, are more at risk for developing eating disorder psychopathology than cisgender men, persons assigned male sex at birth and who identify as male (Hudson et al., 2007). Additionally, people of different genders tend to present with different types of eating disorder symptoms. Cisgender men tend to exhibit muscularity-oriented disordered eating which is related to an individual's motivations to acquire more muscle mass (drive for muscularity) and the motivation to decrease body fat (drive for leanness; Murray et al., 2017). Muscularity-oriented disordered eating behaviors are those that are designed to increase muscle mass (e.g., excessive weightlifting, ingesting protein shakes and energy supplements, and anabolic steroid use) and reduce body fat (e.g., food restriction and dieting). In contrast, cisgender women typically exhibit fewer muscularity-oriented disordered eating behaviors and more thinness-oriented patterns of disordered eating such as restriction of food intake, excessive exercise, laxative abuse, and self-induced vomiting. These

disordered eating behaviors are motivated by a desire to achieve a thin body (Murray, 2017).

Similar gender-specific body ideal drives appear to exist among GMIs; however, these differences in thinness-oriented versus muscularity-oriented disordered eating have yet to be adequately assessed for GMIs (Jones et al., 2016). Specifically, it is suggested that transgender women are motivated to engage in disordered eating in order to achieve a womanlier (i.e., thin) body shape ideal whereas transgender men are motivated to obtain a manlier (i.e., muscular/lean) body shape ideal. In support of this, Algars et al. (2012) found that GMIs engaged in weight loss behaviors in order to suppress features associated with their sex assigned at birth and accentuate features congruent with their current gender identity. For example, one transgender male participant reported dieting in order to suppress his female biological sex, reporting, "I felt like I wanted to diet my gender away completely" (pp. 306). However, this qualitative study was limited as it did not address muscularity-oriented behaviors and only included a small sample size. Additional research is needed to assess possible disordered eating development and presentation differences among GMIs with differing gender identities.

Further research is necessary to garner a better understanding of disordered eating among GMIs. To assess possible factors related to etiology, the current study analyzes disordered eating through both general theoretical and gender minority-specific frameworks.

Tripartite Influence Model of Disordered Eating Development

Currently, there exists over fifty general theoretical models that have been developed to explain disordered eating (for a review see Pennesi & Wade, 2016). However, a recent review of these models suggests their quality to be variable with only ten models being identified as having been utilized as the theoretical basis for disordered eating interventions that can be empirically tested (Pennesi & Wade, 2016). Out of these ten models, the tripartite influence model of body dissatisfaction and disordered eating represents the best fit for this study as it works to explain the etiology of disordered eating in general and is not specific to one eating disorder diagnosis (e.g., anorexia nervosa or bulimia nervosa). As well, this model can be generalized to both men and women. Lastly, this model was chosen because of its similarities with the gender minority stress and resilience model as both frameworks theorize disordered eating etiology through the interaction of interpersonal and intrapersonal factors.

The tripartite influence (TI) model of body dissatisfaction and disordered eating (Thompson et al., 1999) is a prominent etiological model within the disordered eating literature. The TI model posits that three sociocultural factors (i.e., peer, family, and media influences) promote the development of body dissatisfaction and disordered eating through two mediating factors: social appearance comparison and the internalization of body image ideals. See Figure 1 for a conceptual diagram of the TI model, adapted from Thompson et al. (1999) and Tylka (2011). Sociocultural influences represent the pressures that individuals experience from peers, family, and media sources to have a physical appearance that aligns with Western society's body image ideal. For cisgender

women, these pressures would promote a thin body ideal whereas cisgender men may

feel pressure to obtain a more muscular and lean body (i.e., the muscular ideal). These

sociocultural influences are theorized to lead to the internalization of body image ideals

and increased appearance comparisons, leading to increased body dissatisfaction and

subsequently, more disordered eating. Internalization represents an individual's adoption

of society's body image standard as their own body standard. Appearance comparison is

present when an individual compares and evaluates their own body in relation to the body

of others.
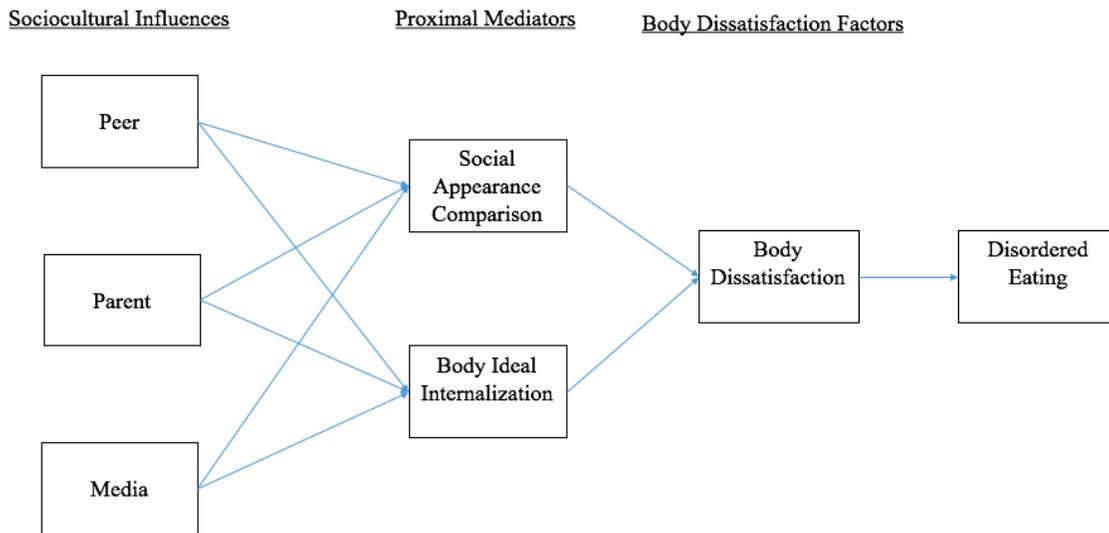
Figure 1. Tripartite influence model of body dissatisfaction and disordered eating.
Tripartite influence model simplified to include core factors related to body
dissatisfaction and disordered eating for both woman-centric (Thompson et al., 1999) and
man-centric (Tylka, 2011) theoretical models.

The original TI model is woman-centric, with model factors reflecting thinness-

oriented behaviors and attitudes. For example, sociocultural influences in the original TI

model represent the pressures from peers, family, and media to have a thin body. To

address the gendered nature of this theoretical framework, the TI model was adapted to fit male samples with original model constructs being modified to reflect muscularity-oriented behaviors and attitudes (Tylka, 2011). Additionally, the male model included a fourth sociocultural influence to represent the pressures that dating partners can exert on an individual. Previous research has shown support for the TI model within samples of adult women (Pennesi & Wade, 2016) as well as support for a modified version of the TI model among adult men (Tylka, 2011; Tylka & Andorka, 2012). However, the TI model has yet to be evaluated in relation to GMIs experiences with disordered eating.

In sum, the TI model represents a prominent general theoretical model that can be applied in research to better explain the development of disordered eating across all individuals. Although general theoretical models are useful in explaining general psychological processes involved in disordered eating development, they do not take into account GMIs unique experiences which may also contribute to disordered eating etiology. Alternatively, population-specific models, such as the gender-minority stress and resilience model, do account for these unique experiences.

Gender Minority Stress and Resilience Model

As discussed above, population-specific models take into account GMIs unique experiences when explaining the development of mental health problems among GMIs. Gender minority stress represents a possible explanation for why GMIs experience elevated rates of disordered eating in comparison to cisgender individuals. The gender minority stress and resilience (GMSR) model, a theoretical model based on Meyer's (2003) minority stress model for lesbian, gay, and bisexual individuals, proposes that

GMIs experience added stressors unique to their gender minority status that contribute to mental health problems (Hendricks & Testa, 2012; Testa et al., 2015). See Figure 2 for a conceptual diagram of the GMSR model, adapted from Testa et al. (2015).
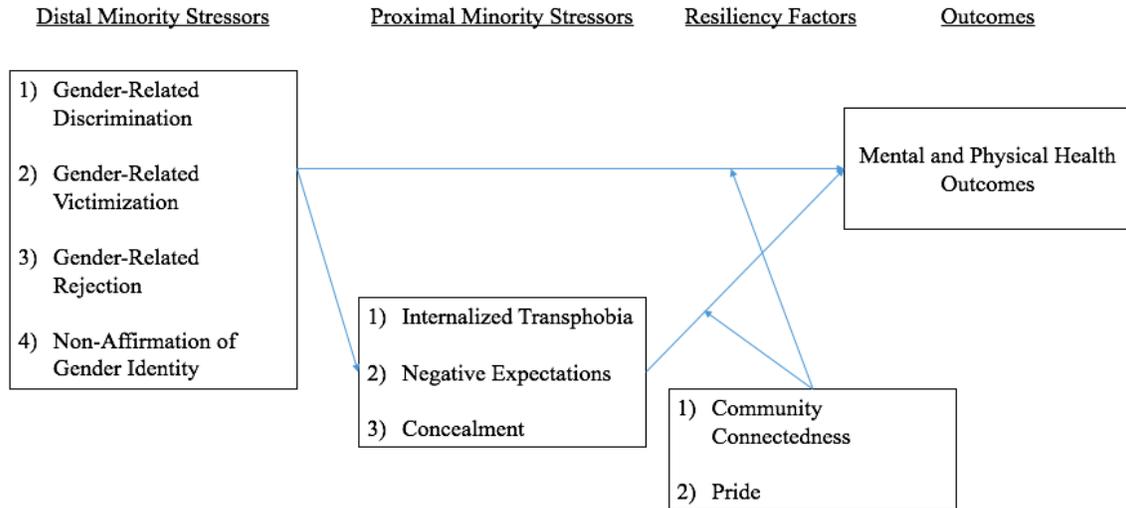
Figure 2. Gender minority stress and resilience model. The gender minority stress and resiliency model as proposed by Testa et al. (2015).

Minority stressors considered in this framework are classified as being either distal or proximal. The GMSR model proposes four distal minority stressors related to individual's direct experiences with external minority-specific stress: gender-related discrimination, victimization, and rejection and non-affirmation of gender identity. Gender-related discrimination represents the discrimination that GMI experience such as being denied housing or employment based on their gender identity or expression. Gender-related victimization includes experiences such as verbal harassment, physical assault, and destruction of property due to GMI gender identity. Examples of gender-related rejection include experiences such as being rejected from school, work, friends,

family, or religious or ethnic communities because of their gender identity or expression. Lastly, non-affirmation of gender identity includes difficulties related to other people's lack of acknowledgement and acceptance of their gender identities or gender expressions. Three proximal, internally related, stressors are also described in the model and are hypothesized to mediate the relationship between distal minority stress and mental health. These stressors include internalized transphobia, negative expectations, and concealment of gender identity. Internalized transphobia represents the degree to which gender minority persons adopt and internalize negative attitudes towards their gender minority identity. Negative expectations include individual's expectations that they may experience harassment, discrimination, and rejection in the future. Concealment characterizes the degree to which GMIs attempt to conceal their gender identity from others.

In addition to identifying factors that may contribute to poorer psychological health, the model identifies the importance of resilience factors which are theorized to moderate the relationships between individuals' experiences with distal and proximal minority stressors and their mental health outcomes. Two resilience factors, community connectedness and pride, are described in the model as being important protective factors against experiences with minority stress. Community connectedness exemplifies gender minority person's connection with the gender minority community. Examples include feelings of belonging and the ability to share their gender identity. Pride represents aspects related to individual's positive attitudes towards their gender identity and expression.

Empirical Support for Minority Stress Models

In relation to the lesbian, gay, and bisexual (LGB) population, there exists a large body of evidence in support of the minority stress paradigm. For example, Meyer's (2003) LGB minority stress model has been utilized to better explain the relationships between minority stressors and negative health outcomes such as depression, anxiety, suicidality, substance misuse, and poor physical health conditions (Goldbach, Tanner-Smith, Bagwell, & Dunlap, 2014; King et al., 2008; Lick, Durso, & Johnson, 2013). A large amount of research shows that, as expected by the minority stress model, distal minority stress, proximal minority stress, and negative health outcomes are positively correlated and a large amount of variance in LGBs mental health outcomes are related to minority stress (Pitoňák, 2017). However, less is known about how minority stressors interrelate to cause negative health outcomes among GMIs.

Recently, the GMSR model has been applied in research to investigate the variability in GMIs experiences with mental health problems. Specifically, the majority of this body of literature has concentrated on investigating the role of minority stress factors in relation to suicidality. Studies have demonstrated support for the relationships between GMSR model factors and suicidal ideation (Scandurra, Amodeo, Valerio, Bochicchio, & Frost, 2017; Staples, Neilson, Bryan, & George, 2018). However, research has not been conducted to assess the GMSR model in relation to disordered eating and body dissatisfaction.

Integrating Population-Specific and General Theoretical Models

Given both gender minority-specific and general theoretical approaches demonstrate empirical support, questions exist as to how best consider these competing etiological models in relation to the assessment and treatment of disordered eating for GMIs. There exist advantages and disadvantages of applying each approach. Utilizing a population-specific approach such as the gender minority stress and resilience model, allows researchers to better understand the role of gender minority-specific factors in the development of disordered eating. However, by only using a population-specific approach, researchers lose out on the vast quantity of information afforded by general theoretical models. General theoretical models of disordered eating are extensively studied and provide empirical support for universal factors that play into the development of disordered eating across all persons. However, important information regarding GMIs unique experiences that are known to be related to mental health outcomes (e.g., minority stress) are not considered nor accounted for when adopting a general approach. Therefore, using an integrative approach that considers both gender-minority specific and general theoretical factors may best explain the development of disordered eating for GMIs. Currently, no research has utilized an integrative approach to understanding disordered eating; although, this approach has been applied to better explain suicidal ideation among GMIs.

Testa et al. (2017a) conducted a study that attempted such an integration to explain suicidal ideation among GMIs. Utilizing path analyses, researchers tested the performance of the GMSR model, the interpersonal psychological theory of suicide

(IPTS; a general theoretical model), and the integration of both model factors in explaining suicidal ideation. Researchers found evidence in support of both theoretical models in explaining suicidal ideation. Interestingly, researchers found that the integration of GMSR model factors and IPTS factors better explained suicidal ideation with 54% of the variance being accounted for by the interrelationship of proximal minority stressors and IPTS factors. In contrast, the GMSR model alone explained only 20% of the variance in suicidal ideation. Taken together, these results provide support for utilizing an integrative approach to understanding gender minority mental health. In the present study, I applied Testa and colleagues' method of analyzing the GMSR model factors in relation to a prominent general theoretical model in efforts to better explain disordered eating among GMIs.

Deficiencies in Research and Study Aims

In summary, GMIs experience high rates of disordered eating and other mental health problems, but our empirical understanding of factors that lead to, and that might mitigate, these problems are limited. The current study aims to address these gaps in the literature by analyzing the ability of population-specific theoretical factors (i.e., the gender minority stress and resilience model) and general theoretical factors (i.e., the tripartite influence model of body dissatisfaction and disordered eating) in explaining disordered eating etiology for GMIs. To my knowledge, no study to date has provided a comprehensive test of the GMSR model or the TI model as they apply to disordered eating for GMIs. Lastly, researchers have yet to investigate the possible integration of these two theoretical frameworks to assess their combined ability to explain disordered

eating for GMIs. To address this deficiency, the present study analyzes the integration of gender-minority stress and resilience model factors and tripartite influence model factors. This approach is based on Testa and colleague's (2017a) methodology.

Study Hypotheses

The current study examines relationships between GMSR model factors, TI model factors, and disordered eating among GMIs. First, GMSR model factors alone are assessed for their ability to explain variance in disordered eating **(**Hypothesis 1**).** Then, the integration of GMSR model factors and TI model factors is analyzed. Specifically, gender minority-specific factors (i.e., GMSR model factors) are evaluated for their ability to add predictive value that is above and beyond that provided by general psychological processes (i.e., TI model factors) when explaining differences in body dissatisfaction (Hypothesis 2) and disordered eating (Hypothesis 3).

Hypothesis 1: Gender minority stress and resilience model factors (i.e., discrimination, rejection, victimization, non-affirmation, internalized transphobia, negative expectations, concealment, community connectedness, and pride) taken together will explain a significant amount of variance in thinness-oriented (H1A) and muscularity-oriented (H1B) disordered eating.

Hypothesis 2: Considering factors from the gender minority stress resilience model will result in a higher proportion of explained variance in body dissatisfaction, above and beyond the explanatory value of tripartite influence model factors.

        H2Ai-ii: Gender minority stressors will explain an additional amount of variance in body dissatisfaction above and beyond the variance accounted for by thinness-

oriented (H2Ai) and muscularity-oriented (H2Aii) tripartite influence model

factors.

H2Bi-ii: Resilience factors will have predictive value above and beyond that

provided by thinness-oriented (H2Bi) and muscularity-oriented (H2Bii) tripartite

influence model factors and gender minority stressors when explaining body

dissatisfaction.

Hypothesis 3: Considering factors from the gender minority stress and resilience model

will result in a higher proportion of explained variance in disordered eating, above and

beyond the predictive value of tripartite influence model factors.

H3Ai-ii: Gender minority stressors will explain an additional amount of variance

in thinness-oriented (H3Ai) and muscularity-oriented (H3Aii) disordered eating

above and beyond the variance accounted for by tripartite influence model factors.

H3Bi-ii: Resilience factors will have predictive value above and beyond that

provided by tripartite influence model factors and gender minority stressors when

explaining thinness-oriented (H3Bi) and muscularity-oriented (H3Bii) disordered

eating.

Methods

Participants

One hundred five self-identified gender minority individuals ages 18 years and older were recruited to participate in the present study. No participant was excluded based on sexual orientation, race, ethnicity, education level, or socioeconomic status; however, persons who were below 18 years of age were excluded. Participants who identified as either a cisgender woman or cisgender man were excluded as the scope of this study was focused on gender minority persons.

Procedures

Participants were recruited through Qualtrics survey panels, an online survey system which matches participants with surveys based on their responses to demographic and background information questions. Once identified by Qualtrics survey panels as possible participants, individuals were given the option whether or not they wished to participate. Therefore, participants in this study were self-selected as they are (1) individuals who elect to take surveys through the Qualtrics panel system, and (2) individuals who choose specific studies in which they wish to participate in. For compensation, Qualtrics utilizes a point system in which participants collect points for completing surveys. These points are then pooled and exchanged for gift cards.

The survey took on average $M = 21.63$ minutes ($SD = 22.66$) for participants to complete. Participants who completed the survey in fewer than 6 minutes ($n = 4$) were excluded from analysis due to data quality concerns. This cut-off was selected following initial study piloting, during which participants took on average 12 minutes to complete

the survey. A cut-off score of 6 minutes was established as it was expected that participants who took less than half of the average completion time would not exhibit reliable responses.

Research Design

The present study employed a cross-sectional, non-experimental design in which participants responded to questionnaires related to demographics, minority stress and resilience model factors, tripartite influence model factors, body dissatisfaction, and disordered eating. The survey was distributed online via Qualtrics and completed from participants' home computers, laptops, or mobile devices. Therefore, study location varied among individual participants.

Materials

Demographics questionnaire. Participants were asked to complete a brief demographics questionnaire containing items that pertained to their sex assigned at birth, current gender identity, age, sexual orientation, ethnicity, education level, employment status, and monthly family income level. To determine gender identity categories, participants were first asked the question, "What sex were you assigned on your birth certificate?" and were given the response choices of either male or female. Participants were then asked, "If you had to choose only one of the following terms, which best describes your current gender identity?" with options being "cross-dresser," "woman," "man," "trans woman (MTF)," "trans man (FTM)," and "non-binary/genderqueer." Four gender identity categories were created based on participants' responses to these two questions: cross-dresser, non-binary/genderqueer, transfeminine individuals, and

transmasculine individuals (US Trans Survey, 2015). Transfeminine individuals included

participants who endorsed "trans woman" as their primary gender identity and

participants who indicated male sex assigned at birth and female primary gender identity.

Transmasculine included participants who endorsed "trans man" as their primary gender

identity and participants who indicated female sex assigned at birth and male primary

gender identity.

Gender minority stress and resiliency measure (GSMRM; Testa et al., 2015). The

GMSRM is a 58-item self-report questionnaire developed to assess GMIs experiences

with distal and proximal minority stressors in addition to levels of resiliency. The

GMSRM includes nine subscales assessing gender-related discrimination (5 items),

gender-related victimization (6 items), gender-related rejection (6 items), non-affirmation

of gender identity (6 items), internalized transphobia (8 items), negative expectations (9

items), concealment (5 items), pride (8 items), and community connectedness (5 items).

Gender-related discrimination, victimization, and rejection subscale items ask

participants to report whether they have experienced events related to each distal stress

construct (sample discrimination item: "I have had difficulty finding housing or staying

in housing because of my gender identity or expression."). Participants were given the

following response choices for these three subscale items: *Never; Yes, before age 18;*

Yes, after age 18; Yes, in the past year. A "Never" response choice was coded as 0

whereas all "Yes" response choices were coded as 1. Non-affirmation, negative

expectations, internalized transphobia, concealment, pride, and community

connectedness subscale items asked participants to respond on a 5-point scale (1 =

strongly disagree, 5 = *strongly agree*). Some example items include, "I feel that my gender identity or expression is embarrassing" (internalized transphobia) and "I have difficulty being perceived as my gender" (non-affirmation). Total scores were calculated for each subscale where higher scores indicated higher levels of each factor. Testa et al. (2015) demonstrated adequate reliability, criterion validity, convergent validity, and discriminant validity for each of the nine subscales.

Perceived sociocultural pressures scale (PSPS; Stice, Ziemba, Margolis, & Flick, 1996). The PSPS is an 8-item self-report questionnaire designed to assess the extent to which an individual feels pressure from their family, peers, dating partners, or the media to lose weight or have a thin body. Each sociocultural influence factor was assessed by two survey items (sample item: "I've felt pressure from my friends to lose weight"). To measure muscularity-oriented sociocultural influences, PSPS questions were modified as described in Tylka (2011). Specifically, "be more muscular and/or lean" was substituted for "lose weight" and "have a muscular and/or lean body" for "have a thin body." Items were rated on a 5-point scale (1 = *never*, 5 = *always*). Higher scores indicated greater perceived sociocultural pressures. Previous research has demonstrated good reliability for both the original PSPS (α = .87; Lovering, Rodgers, George, & Franko, 2018) and the modified PSPS (α = .86; Tylka, Bergeron, & Schwartz, 2005).

Physical appearance comparison scale (PACS; Thompson, Heinberg, & Tantleff-Dunn, 1991). The PACS is a 5-item self-report questionnaire designed to assess an individual's tendency to compare their physical appearance to the physical appearance of others (sample item: "At parties and other social events, I compare my physical

appearance to the physical appearance of others." Items were rated on a 5-point scale ranging from 1 (*never*) to 5 (*always*), with higher scores indicating more social appearance comparison. Studies have demonstrated good reliability for the PACS in both female (α = .73; Lovering et al., 2018) and male samples (α = .74; Tylka et al., 2005).

Internalization subscales of the sociocultural attitudes towards appearance questionnaire-4 (SATAQ-4; Schaefer et al., 2015). The 5-item thin ideal internalization and the 5-item muscularity ideal internalization subscales of the SATAQ-4 were used to measure individual's internalization of society's body image ideals. The thin/low body fat internalization subscale measures individual's adoption of a thinness-oriented ideal (sample item: "I want my body to look very thin") whereas the muscular/athletic subscale measures an individual's adoption of a muscularity-oriented ideal (sample item: "I think a lot about looking muscular"). Items were rated on a 5-point scale where a value of 1 represented "*definitely disagree*" and a value of 5 represented "*definitely agree*". Higher scores indicated greater internalization of society's body image ideal. The SATAQ-4 thin/low body fat and muscular/athletic internalization subscales have demonstrated high reliability (α = .87, α = .91) and good convergent validity (Schaefer et al., 2015).

Body-image ideals questionnaire (BIQ; Cash & Szymanski, 1995). The BIQ is a 22-item self-report questionnaire designed to measure individual's level of body-image satisfaction. 11 physical characteristics were assessed, including: height, skin complexion, hair texture and thickness, facial features, muscle tone and definition, body proportions, weight, chest size, physical strength, physical coordination, and overall physical appearance. For each characteristic, participants were asked to indicate how

close their current image matched their ideal image on a 4-point Likert-like scale (0 = *exactly as I am*, 3 = *very unlike me*). Next, participants were asked to rate how important each physical characteristic was to them (0 = *not important*, 3 = *very important*). Mean cross products were computed for each physical characteristic. Scores ranged from -3 (very important congruence across all physical characteristics) to +9 (very important and maximum discrepancies between current body image and body image ideal). Higher scores indicated more body dissatisfaction. The BIQ has demonstrated good reliability (α = .77; Cash & Szymanski, 1995).

Eating attitudes test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982). The EAT-26 is a 26-item self-report questionnaire designed to measure disordered eating psychopathology. The EAT-26 contains three subscales: dieting (13 items), bulimia/food preoccupation (6 items), and oral control (7 items). The dieting subscale measures the extent to which an individual thinks about and engages in dieting behaviors in efforts to control their body weight (sample items: "I am preoccupied with the thought of having fat on my body" and "I engage in dieting behavior"). The bulimia/food preoccupation subscale measures the extent to which an individual is preoccupied with food and dieting as well as the degree to which an individual engages in bulimic behaviors (sample items: "I vomit after I have eaten" and "I give too much time and thought to food"). Lastly, the oral control subscale measures behaviors related to the control an individual exerts over their food and food consumption (sample items: "I cut my food into smaller pieces" and "I feel that others would prefer if I ate more").

Although, Garner and colleagues (1982) recommended using a coding system where *sometimes*, *rarely*, and *never* responses are coded as 0 and *often*, *usually*, and *always* are coded as 1, 2, and 3 respectively, an alternative coding system has been utilized in prior research to maximize variability in disordered eating scores (Tylka, 2011). For this study, primary analyses utilized this alternative coding scheme where items were rated on a 6-point scale (6 = *always*, 1 = *never*) with higher scores indicating more disordered eating. Garner and colleagues' coding scheme was employed to identify the number of participants at risk for a clinically significant eating disorder who would be referred to a clinician for possible diagnosis. Participants who scored 20 or higher on the EAT-26 were considered at risk.

Though the EAT-26 has been administered and used in research assessing disordered eating in male populations (Tylka, 2011; Tylka & Andorka, 2012), this measure does not represent all facets of disordered eating as the EAT-26 focuses primarily on thinness-oriented thoughts and behaviors and does not include muscularity-oriented items. Therefore, a measure which assesses muscularity-oriented disordered eating was also included in the present study.

Drive for muscularity scale (DMS; McCreary, 2007). The DMS is a 15 item self-report questionnaire designed to measure the extent to which an individual perceives that they are not muscular enough (regardless of their actual amount of muscle mass or body fat) and the extent to which they engage in muscle building activities (sample items: "I think I would feel more confident if I had more muscle mass" and "I lift weights to build

up muscle"). Items were rated on a 6-point scale (1 = *never*, 6 = *always*) with higher

scores indicated higher drive for muscularity.

Data Management

After data collection was completed, a subjective visual inspection of the data was

first conducted in order to assess possible issues with data quality. It was observed that

for a subset of the sample there existed a lack of variability in item responses, suggesting

straightlining may have been an issue. Straight-lining represents the tendency for

participants to endorse an identical or nearly identical response across survey scale items

(Yan, 2008) and can be an issue in survey-based research as it may impact the reliability

and validity of survey scales (Kim, Dykema, Stevenson, Black, & Moberg, 2019). To

address these concerns, a quantitative approach was employed to systematically identify

possible study straightliners. Although there is currently no standard procedure to

quantitatively identify straightliners (AAPOR, 2010), Kim and colleagues report five

methods that have been utilized in prior research to assess for straight-lining: simple

nondifferentiation, mean root of pairs, maximum identical rating, standard deviation of

battery, and scale point variation methods.

A simple nondifferentiation methodology was employed to assess for straight-lining.

See Kim et al. (2019) for a description of simple nondifferentiation procedures. As there

are no standard practices for identifying straightliners, an arbitrary cut-off score was

chosen a priori to identify participants as straightliners. For this study, straightliners were

defined as participants who straightlined, as indicated by simple nondifferentiation, on

more than 50 percent of the study measures (e.g., the EAT-26, victimization subscale of

the GMSRM). Table 1 describes the number of subjects who straightlined per study survey. This cut-off was chosen as it was expected that some scales would elicit similar responses across all items (e.g., if participants had never experienced gender-related discrimination, all discrimination subscale item responses would be zero); although, it is unlikely that this response pattern would be seen across more than 50 percent of survey scales. A total of 12 participants were identified as straightliners (i.e., participants who straightlined on 8 or more survey scales) and were excluded from study analyses, resulting in a final sample of 93 participants.

Table 1

Frequency of Straightlining Across Measures

Measure	Frequency ($N = 105$)	Percent
Body-Image Ideals Questionnaire	2	1.9
Eating Attitudes Test 26	2	1.9
Drive for Muscularity Scale	12	11.4
Gender Minority Stress and Resilience Measure		
Discrimination Subscale	41	39
Victimization Subscale	31	29.5
Rejection Subscale	29	27.6
Non-Affirmation Subscale	13	12.4
Internalized Transphobia Subscale	15	14.3
Negative Expectations Subscale	19	18.1
Concealment Subscale	28	26.7
Community Connectedness Subscale	16	15.2
Pride Subscale	14	13.3
Perceived Sociocultural Pressures Scale-Thinness	22	21
Perceived Sociocultural Pressures Scale-Muscularity	27	25.7
Physical Appearance Comparison Scale	15	14.3
Sociocultural Attitudes Towards Appearance Scale- 4	15	14.3
Total Straight-liners Identified	12	11.4

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A series of independent samples t-tests and chi-square tests of independence were run to evaluate whether the final sample ($N = 93$) differed significantly from the excluded sample of straightliners ($n = 12$) in terms of their demographics and their mental health experiences. Results of the independent samples t-tests revealed that the groups differed in their experiences with muscularity-oriented disordered eating, $t(101) = 3.06, p < .01$, such that the final sample ($M = 46.99, SD = 17.31$) reported significantly higher drive for muscularity than the excluded straightliners ($M = 29.83, SD = 24.77$). Age, thinness-oriented disordered eating, and body dissatisfaction scores did not differ significantly between groups. A chi-square test of independence demonstrated a significant association between the two groups and sex assigned at birth ($x^2(1) = 7.32, p < .01$). For the straightlining group (n = 12), it was found that the expected count for female sex assigned at birth (n = 5.6) was significantly lower than the actual count (n = 10). Chi-square analyses assessing differences in income levels, education, race, and gender identity variables demonstrated violations of the expected frequencies assumption, therefore Fisher's exact tests were utilized. Analyses revealed significant differences in income levels, $x^2(6) = 18.09, p < .01$, such that the straightlining group had a higher number of reported income of less than 25,000 a year (n = 10) than what was expected (n = 3). No significant associations with group identity were observed for education, race, or gender identity.

Little's test of missing completely at random (Little, 1988) was conducted to investigate the nature of missingness for missing cases. Little's MCAR test was non-significant, $x^2(325) = 298.31, p = .85$, suggesting missing data demonstrated no

identifiable pattern of missingness. This finding supports the conclusion that the missing

data observed was missing completely at random. Therefore, pairwise deletion was used

in study analyses.

Results

Demographics

Table 2 contains a full description of participants' demographics. Of the 93 participants (Age: $M = 34.19$, $SD = 12.02$), 46% (n = 43) identified as transfeminine, 33% (n = 31) as transmasculine, 8% (n = 7) as gender non-binary, and 13% identified as crossdressers (n = 12). More than half of the participants were White (61%) with the remaining sample reporting other racial identities: African American (17%), Asian (7%), American Indian or Alaska Native (4%), Native Hawaiian or Pacific Islander (2%), multi-racial (5%), or a racial identity that was not listed (3%). The majority of participants worked fulltime (71%) and had received at least a high school education or equivalent (96.8%). Annual income levels ranged from less than $25K (17.2%) to more than $150K (8%), with the most frequent income level being $50K - 75K (26%) across participants.

Table 2

Participant Demographics

Factor		Frequency	Percent
Gender Identity			
	Transfeminine	43	46.2
	Transmasculine	31	33.3
	Crossdresser	12	12.9
	Non-Binary	7	7.5
Gender Terms			
	Transgender	64	68.8
	Bi-Gender	13	14.0
	Trans	10	10.8
	Transman	10	10.8
	Crossdresser	9	9.7
	Transsexual	8	8.6
	Gender non-conforming or gender variant	7	7.5
	Gender fluid/fluid	7	7.5
	Transwoman	7	7.5
	AG or Aggressive	6	6.5
	Agender	6	6.5
	Genderqueer	6	6.5
	Butch	5	5.4
	Bulldagger	5	5.4
	Drag performer (king/queen)	5	5.4
	Two-spirit	5	5.4
	Intersex	4	4.3
	Stud	4	4.3
	Androgynous	3	3.2
	Multi-gender	3	3.2
	Non-binary	3	3.2
	Travesti	3	3.2
	A gender not listed above	3	3.2
	Third gender	2	2.2
	Mahu	1	1.1
	Fa'afafine	0	0
Lived Gender			
	Man	39	41.9
	Woman	34	36.6
	Part time one gender/part time another gender	12	12.9
	Neither/Gender queer/ non-binary	8	8.6
Perceived as Trans			

	Sometimes	26	28.0
	Always	25	26.9
	Most of the time	21	22.6
	Rarely	16	17.2
	Never	5	5.4
Sexual Orientation			
	Bisexual	30	32.3
	Gay	13	14.0
	Asexual	12	12.9
	Heterosexual	8	8.6
	Lesbian	8	8.6
	Pansexual	8	8.6
	Same-gender loving	4	4.3
	Queer	2	2.2
	Other	2	2.2
Relationship Status			
	Single	38	40.9
	Married	24	25.8
	Long-term relationship	22	23.7
	Divorced	6	6.5
	Separated	3	3.2
Geographic Location			
	Southeast	30	32.3
	Northeast	23	24.7
	Midwest	16	17.2
	West	15	16.1
	Southwest	8	8.6
Race			
	White	57	61.3
	African American	16	17.2
	Asian	6	6.5
	Multi-Racial	5	5.4
	American Indian or Alaska Native	4	4.3
	Other	3	3.2
	Native Hawaiian or Pacific Islander	2	2.2
Annual Income			
	$50,000 - 74,999	24	25.8
	Under $25,000	16	17.2
	$35,000 - 49,999	15	16.1
	$75,000 - 99,999	12	12.9
	$100,000 - 150,000	11	11.8
	$25,000 - 34,999	8	8.6
	Above $150,000	7	7.5
Work hours (weekly)			

More than 35 hrs	66	71.0
Less than 35 hrs	15	16.1
Unemployed	11	11.8
Education		
Associate's degree	23	24.7
Bachelor's degree	22	23.7
High school diploma or GED	16	17.2
Master's degree	15	16.1
Some college	14	15.1
Some high school	3	3.2

Descriptive Statistics

Table 3 shows descriptive statistics for all criterion and predictor variables included in the study. Participants reported experiences with both thinness-oriented (M = 87.60, SD = 28.42) and muscularity-oriented (M = 46.99, SD = 17.31) disordered eating as well as experiences with body dissatisfaction (M = 1.47, SD = 1.67). Forty-one percent of study participants (n = 38) demonstrated scores above previously-reported cutoffs for being at risk of clinically significant eating disorder in general samples (Garner, Olmsted, Bohr, & Garfinkel, 1982). Lifetime experiences with distal minority stressors were prevalent in this sample. Over their lifetimes, participants reported experiencing an average of 3.44 discrete types of gender-related victimization (range: 0-6), 4.20 rejection experiences (range: 0-6), and 3.97 discrimination experiences (range: 0-5). In total, 84.4% of participants reported at least one gender-related discrimination experience, 86.2% at least one victimization experience, and 88.8% at least one rejection experience.

Table 3

Summary of Reliability Statistics and Descriptive Statistics for Study Scales

Measure	Alpha	Mean	SD	Range
Body-Image Ideals Questionnaire	.78	1.47	1.67	12
Shape and Weight Related Subscale	.73	1.98	2.45	12
Eating Attitudes Test-26	.96	87.60	28.42	112
Drive for Muscularity Scale	.95	46.99	17.31	75
Gender Minority Stress and Resilience Measure				
Discrimination	.85	3.44	1.82	5
Victimization	.88	3.97	2.25	6
Rejection	.85	4.20	2.10	6
Non-Affirmation	.84	20.34	5.23	24
Internalized Transphobia	.87	25.26	7.71	32
Negative Expectations	.92	30.46	8.61	36
Concealment	.85	16.92	4.84	20
Community Connectedness	.34	16.22	3.13	20
Pride	.85	28.61	6.59	32
Perceived Sociocultural Pressures Scale-Thinness				
Peer Influences	.78	5.35	2.47	8
Family Influences	.90	5.63	2.66	8
Media Influences	.79	6.05	2.57	8
Perceived Sociocultural Pressures Scale-Muscularity				
Peer Influences	.80	5.32	2.48	8
Family Influences	.82	5.53	2.57	8
Media Influences	.81	5.77	2.36	8
Physical Appearance Comparison Scale	.58	15.63	3.74	18
Sociocultural Attitudes Towards Appearance Scale- 4				
Thinness	.78	17.54	4.42	20
Muscularity	.90	16.02	5.29	20

Scale Reliability

Reliability analyses were conducted for all study variables in order to assess the

internal consistency of each scale (Table 3). All study measures, excepting the physical

appearance comparison scale and the community connectedness subscale, demonstrated

acceptable internal consistency (range: Cronbach's α = .78 to α = .96). Reliability

coefficients were low for physical appearance comparison (α = .58) and community

connectedness (α = .34); therefore, results of analyses utilizing these two scales should be

interpreted with caution.

Correlations Among Study Variables

Table 4 shows Person's product moment correlation coefficients describing

relationships among the study predictors (i.e., GMSR model factors and TI model

factors) and dependent variables (i.e., disordered eating and body dissatisfaction). All

seven gender minority stressors were significantly positively related to each other (range:

r = .22 to r = .77, p < .05) except the relationship between non-affirmation and

victimization which was non-significant (r = .19, p = .09). Resilience factors (i.e.,

community connectedness and pride) were positively related to each other (r = .41, p <

.001) and demonstrated some significant associations with the seven minority stressors.

Specifically, community connectedness was significantly negatively related to

discrimination (r = -.24, p = .03), victimization (r = -.31, p < .01), internalized

transphobia (r = -.26, p = .02), and concealment (r = -.34, p < .01) whereas pride was

found to be significantly positively related to non-affirmation (r = .47, p < .001) and

internalized transphobia (r = .22, p = .04). All other relationships between the two

resilience factors and seven minority stressors were non-significant (see Table 4).

Table 4

Correlations Among Study Variables (n = 93)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Discrimination	--																				
2. Victimization	.61 ***	--																			
3. Rejection	.75 ***	.66 ***	--																		
4. Non-Affirmation	.27 *	.19	.22 *	--																	
5. Internalized Transphobia	.29 **	.30 **	.34 **	.59 ***	--																
6. Negative Expectations	.32 **	.32 **	.39 ***	.60 ***	.69 ***	--															
7. Concealment	.31 **	.30 **	.36 **	.59 ***	.68 ***	.77 ***	--														
8. Community Connectedness	-.24 *	-.31 **	-.18	.05	-.26 *	-.20	-.34 **	--													
9. Pride	-.07	-.09	-.11	.47 ***	.22 *	.09	.16	.41 ***	--												
10. Peer Influences-T	.35 **	.42 ***	.37 ***	.31 **	.57 ***	.34 **	.37 ***	-.30 **	.15	--											
11. Family Influences-T	.36 ***	.40 ***	.31 **	.29 **	.52 ***	.26 *	.40 ***	-.27 **	.18	.80 ***	--										
12. Media Influences-T	.25 *	.39 ***	.28 *	.48 ***	.44 ***	.49 ***	.54 ***	-.08	.26 *	.54 ***	.56 ***	--									
13. Peer Influences-M	.36 **	.42 ***	.34 **	.35 **	.51 ***	.34 **	.37 ***	-.13	.31 **	.77 ***	.75 ***	.53 ***	--								
14. Family Influences-M	.40 ***	.42 ***	.37 ***	.27 *	.41 ***	.27 *	.35 **	-.28 **	.21 *	.74 ***	.77 ***	.47 ***	.81 ***	--							
15. Media Influences-M	.25 *	.36 **	.33 **	.27 *	.30 **	.30 **	.33 **	-.16	.28 **	.60 ***	.60 ***	.58 ***	.66 ***	.68 ***	--						
16. Social Appearance Comparison	.25 *	.29 **	.20	.32 **	.35 **	.44 ***	.55 ***	-.24 *	.16	.42 ***	.34 **	.54 ***	.35 **	.32 **	.39 ***	--					
17. Body Ideal Internalization-T	.12	.26 *	.18	.45 ***	.45 ***	.41 ***	.42 ***	-.11	.30 **	.56 ***	.46 ***	.44 ***	.47 ***	.47 ***	.52 ***	.50 ***	--				
18. Body Ideal Internalization-M	.15	.27 *	.20	.34 **	.28 **	.20	.35 **	-.03	.41 ***	.57 ***	.45 ***	.35 **	.57 ***	.55 ***	.55 ***	.34 **	.62 ***	--			
19. Body Dissatisfaction	.27 **	.23 *	.34 **	.35 **	.16	.37 **	.25 *	.08	-.02	-.04	.00	.22 *	-.03	-.05	.19	.16	.08	-.08	--		
20. Disordered Eating-T	.43 ***	.51 ***	.39 ***	.46 ***	.51 ***	.46 ***	.51 ***	-.31 **	.27 *	.63 ***	.60 ***	.57 ***	.61 ***	.62 ***	.57 ***	.46 ***	.55 ***	.55 ***	.20	--	
21. Disordered Eating-M	.29 **	.38 ***	.24 *	.35 **	.37 ***	.15	.26 *	-.05	.44 ***	.62 ***	.59 ***	.42 ***	.69 ***	.65 ***	.65 ***	.28 **	.44 ***	.71 ***	-.04	.56 ***	--

*p < .05, **p < .01, ***p < .001

All TI model factors, including both thinness-oriented and muscularity-oriented variables, were significantly related to each other. Specifically, sociocultural pressures to have a thin or muscular body (i.e., peer, family, and media influences) were positively interrelated (range: $r = .47$ to $r = .81$, $p < .001$). Proximal TI model factors, physical appearance comparison and body ideal internalization (both muscular and thin ideals), were positively related to each other (range: $r = .34$ to $r = .62$, $p < .01$) and also demonstrated positive associations with sociocultural pressures (range: $r = .32$ to $r = .57$, $p < .01$). Overall, these findings suggest that increases in sociocultural pressures to obtain a thin or muscular body were related to more internalization of society's body image ideals and more physical appearance comparing.

Significant relationships were found between the nine GMSR model factors and the nine muscularity-oriented and thinness-oriented TI model factors. All six sociocultural influences (i.e., peer, family, and media influences to be thin or muscular) were significantly positively related to the seven gender minority stressors (range: $r = .25$ to $r = .57$, $p < .05$) suggesting that more external pressures to have a thin or muscular body were related to more experiences with external minority stress (i.e., gender related discrimination, victimization, rejection, and non-affirmation) and internal minority stress (i.e., internalized transphobia, gender identity concealment, and negative expectations). Furthermore, almost all gender minority stressors demonstrated significant positive relationships with the three proximal TI model factors: physical appearance comparison (range: $r = .25$ to $r = .55$, $p < .05$; excepting rejection), thinness-oriented body ideal internalization (range: $r = .26$ to $r = .45$, $p < .05$; excepting rejection and discrimination),

and muscularity-oriented body ideal internalization (range: $r = .27$ to $r = .35$, $p < .05$; excepting rejection, discrimination, and non-affirmation).

The two resilience factors demonstrated some significant relationships with the nine TI model factors. Specifically, pride showed significant positive associations with all TI model factors (range: $r = .21$ to $r = .41$, $p < .05$), excepting thinness-oriented pressures from peers and family and physical appearance comparison which were non-significant. Unlike pride which demonstrated positive associations, community connectedness showed significant negative relationships with four of the nine TI model variables: thinness-oriented peer influences ($r = -.30$, $p < .01$), thinness-oriented family influences ($r = -.27$, $p < .01$), muscularity-oriented family influences ($r = -.28$, $p < .01$), and physical appearance comparison ($r = -.24$, $p = .02$). All other associations were non-significant.

The majority of the relationships between the two theoretical models and disordered eating were significant; however, relationships with body dissatisfaction were inconsistent. In relation to thinness-oriented disordered eating, all nine TI model factors (range: $r = .46$ to $r = .63$, $p < .001$) and seven gender minority stressors (range: $r = .39$ to $r = .51$, $p < .001$) demonstrated significant positive associations with thinness-oriented disordered eating. Community connectedness showed a significant negative relationship ($r = -.31$, $p < .01$), whereas pride, contrary to expectations, showed a significant positive relationship with thinness-oriented disordered eating, $r = .27$, $p = .01$. All TI model factors were positively related to muscularity-oriented disordered eating (range: $r = .28$ to $r = .71$, $p < .01$) and all factors of the GMSR model, excepting negative expectations ($r = .15$, $p = .16$) and community connectedness ($r = -.05$, $p = .66$), showed significant

positive associations with muscularity-oriented disordered eating (range: $r = .24$ to $r = .44$, $p < .01$). Lastly, body dissatisfaction demonstrated a significant positive relationship with thinness-oriented media pressures ($r = .22$, $p = .04$). All other relationships with TI model factors were non-significant (range: $r = -.08$ to $r = .16$, $p > .10$), excepting pressures from the media to be muscular which demonstrated a non-significant positive relationship with body dissatisfaction, $r = .19$, $p = .07$. In relation to the GMSR model, body dissatisfaction demonstrated significant positive relationships with all gender minority stressors (range: $r = .23$ to $r = .37$, $p < .05$) with the exception of internalized transphobia which was non-significant, $r = 16$, $p = .13$. Neither community connectedness ($r = .08$, $p = .47$) nor pride ($r = -.02$, $p = .84$) showed significant relationships with body dissatisfaction.

Finally, relationships among dependent variables were evaluated. There demonstrated a strong positive association between thinness-oriented and muscularity oriented disordered eating ($r = .56$, $p < .001$), suggesting that participants' who reported higher levels of thinness-oriented disordered eating experiences were likely to report higher levels of muscularity-oriented disordered eating. Interestingly, body dissatisfaction demonstrated no significant association with muscularity-oriented disordered eating ($r = -.04$, $p = .67$) or thinness-oriented disordered eating ($r = .20$, $p = .07$).

In sum, almost all relationships observed were in the expected directions. Positive associations were found between the nine TI model factors, aligning with the proposed theoretical model (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). For the GMSR model factors, the majority of relationships aligned with the theoretical framework

(Hendricks & Testa, 2012; Testa et al., 2015), with positive relationships being observed among the seven gender minority stressors and negative relationships found between the minority stressors and community connectedness. Unexpectedly, the resilience factor pride demonstrated positive associations with gender minority stress. This finding represents a notable deviation from the Hendricks and Testa's (2012) proposed theoretical framework which theorizes pride to be an important protective factor against the deleterious effects of gender-minority minority stress. Furthermore, the majority of relationships between the two models and study outcomes were as expected, excepting relationships between body dissatisfaction and the TI model which were inconsistent with the theoretical framework. Muscularity-oriented and thinness-oriented disordered eating showed strong positive associations with each other; however, unexpectedly, disordered eating was not found to be significantly related to body dissatisfaction. This finding contrasts sharply with many prior studies showing strong positive relationships between body dissatisfaction and disordered eating (de Carvalho, Alvarenga, & Ferreira, 2017; Rodgers, Chabrol, & Paxton, 2011; Tylka, 2011). In response to this finding, additional analyses were conducted to further investigate the link between body dissatisfaction and disordered eating in our sample (see exploratory analyses section below).

Main Analyses

Tests of hypothesis 1. Hypothesis 1A and 1B were tested via multiple regression. See Tables 5 and 6 for a report of the thinness-oriented and muscularity-oriented disordered eating analyses, respectively.

Table 5

Standard Multiple Regression: GMSR Factors Predicting Thinness-Oriented Disordered Eating

Predictor	r	β	R^2	F
Gender Minority Stress and Resilience Factors			.59***	9.73
Discrimination	.43***	.03		
Victimization	.51***	.32*		
Rejection	.39***	.06		
Non-Affirmation	.46***	.09		
Internalized Transphobia	.51***	.20		
Negative Expectations	.47***	-.07		
Concealment	.51***	.16		
Community Connectedness	-.31**	-.22[a]		
Pride	.27*	.35**		

[a]$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Table 6

Standard Multiple Regression: GMSR Factors Predicting Muscularity-Oriented Disordered Eating

Predictor	r	β	R^2	F
Gender Minority Stress and Resilience Factors			.42***	5.24
Discrimination	.29**	-.02		
Victimization	.38***	.46**		
Rejection	.24*	-.03		
Non-Affirmation	.35**	-.07		
Internalized Transphobia	.37***	.28[a]		
Negative Expectations	.15	-.24		
Concealment	.26*	.07		
Community Connectedness	-.05	.00		
Pride	.44***	.45***		

[a]$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

To test H1A, thinness-oriented disordered eating was simultaneously regressed on all seven gender minority stress factors and both resilience factors. The overall relationship between the GMSR model factors and thinness-oriented disordered eating was significant ($R^2 = .59$, $F(9, 60) = 9.73$, $p < .01$) suggesting that gender minority stress and resilience accounted for a high proportion of variance in thinness-oriented disordered eating,

consistent with H1A. Victimization ($\beta = .32$, $p = .01$) and pride ($\beta = .35$, $p < .01$) were uniquely, positively related to thinness-oriented disordered eating. Community connectedness ($\beta = -.22$, $p = .05$) demonstrated a non-significant negative contribution to the model. No other GMSR model factors (i.e., discrimination, rejection, non-affirmation, internalized transphobia, negative expectations, and concealment) showed unique relationships, although each predictor demonstrated a significant zero-order relationship with thinness-oriented disordered eating. This pattern of findings may be due to multicollinearity among the nine GMSR model factors (see Table 4); although, it should be noted that all variance inflation factors (VIFs) were less than 5 across the six regression analyses, representing values under the commonly accepted limit (Hair, Anderson, Taham, & Black, 1995).

To test H2B, muscularity-oriented disordered eating was simultaneously regressed on GMSR model factors. Consistent with Hypothesis H2B, gender minority stress and resilience model factors accounted for a large proportion of variance in muscularity-oriented disordered eating ($R^2 = .42$, $F(9, 64) = 5.24$, $p < .01$). As with tests of H1A, only gender-related victimization ($\beta = .46$, $p < .01$) and pride ($\beta = .45$, $p < .001$) demonstrated significant unique contributions to the model. All other GMSR variables did not demonstrate significant unique relationships with muscularity-oriented disordered eating.

Tests of hypothesis 2. Next, two hierarchical multiple regression analyses were conducted to test the incremental ability of GMSR model factors to explain variance in body dissatisfaction above and beyond TI model factors (H2A and H2B). TI model factors (i.e., peer, family, and media pressures, social appearance comparison, and body

ideal internalization) were entered as predictors in the first step, gender minority stressors

(i.e., discrimination, rejection, victimization, non-affirmation, internalized transphobia,

negative expectations, and concealment) were entered as a set in the second step, and

resilience factors (i.e., community connectedness and pride) were entered in the third

step. In the first analysis, thinness-oriented TI model factors (e.g., pressures from family

to have a thin body) were entered in Step 1, and in the second analysis, muscularity-

oriented TI model factors (e.g., pressures from family to have a muscular body) were

entered in Step 1. See Tables 7 and 8 for a summary of the two regression analyses.

Table 7

Hierarchical Multiple Regression: Thinness-Oriented TI Factors and GMSR Factors
Predicting Body Dissatisfaction

Predictor	r	β	R^2	ΔR^2
Step 1: Tripartite Influence Factors			.13	.13
Peer Influences - Thinness	-.04	-.20		
Family Influences – Thinness	.00	-.13		
Media Influences - Thinness	.22*	.34*		
Social Appearance Comparison	.16	.05		
Body Ideal Internalization – Thinness	.08	.11		
Step 2: Gender Minority Stressors			.35**	.23*
Discrimination	.27**	.04		
Victimization	.23*	.10		
Rejection	.34**	.27		
Non-Affirmation	.35**	.21		
Internalized Transphobia	.16	-.06		
Negative Expectations	.37**	.28		
Concealment	.25*	-.13		
Step 3: Resilience Factors			.38**	.03
Community Connectedness	.08	.19		
Pride	-.02	-.19		

[a]$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Table 8

Hierarchical Multiple Regression: Muscularity-Oriented TI Factors and GMSR Factors Predicting Body Dissatisfaction

Predictor	r	β	R^2	ΔR^2
Step 1: Tripartite Influence Factors			.21**	.21**
Peer Influences - Muscularity	-.03	.22		
Family Influences – Muscularity	-.05	-.47*		
Media Influences - Muscularity	.19[a]	.45**		
Social Appearance Comparison	.16	.22[a]		
Body Ideal Internalization – Muscularity	-.08	-.29*		
Step 2: Gender Minority Stressors			.44***	.24**
Discrimination	.27**	-.08		
Victimization	.23*	.05		
Rejection	.34**	.29[a]		
Non-Affirmation	.35**	.26[a]		
Internalized Transphobia	.16	-.20		
Negative Expectations	.37**	.25		
Concealment	.25*	.09		
Step 3: Resilience Factors			.47***	.03
Community Connectedness	.08	.24[a]		
Pride	-.02	-.11		

[a]$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Incremental utility of GMSR factors beyond thinness-oriented TI factors. In the

first regression analysis, the overall relationship between the thinness-oriented TI model

factors (i.e., peer, family, and media influences to have a thin body, social appearance

comparison, and thinness-oriented body ideal internalization) and body dissatisfaction

was non-significant, $R^2 = .13$, $F(5, 66) = 1.92$, $p = .10$. This finding suggests that the

thinness-oriented TI model did not explain significant variability in GMIs' experiences

with body dissatisfaction. When gender minority stress factors were added in Step 2, the

overall R-squared increased by 0.23, ($p < .01$), suggesting that gender minority stress

explained additional variance in body dissatisfaction, above and beyond muscularity-

oriented TI factors, consistent with H2Ai. When resilience factors were entered in Step 3,

the change in total variance explained was not significant, ($\Delta R^2 = .03$, $F(2, 57) = 1.18$, $p = .32$), inconsistent with H2Bi.

Incremental utility of GMSR factors beyond muscularity-oriented TI factors. A second hierarchical multiple regression analysis was performed to evaluate the added explanatory power of the GMSR model that is above and beyond the predictive power of the muscularity-oriented TI model factors in explaining body dissatisfaction among GMIs. The overall relationship between the five muscularity-oriented TI model factors (i.e., peer, family, and media influences to have a muscular body, social appearance comparison, and muscularity-oriented body ideal internalization) and body dissatisfaction was significant ($R^2 = .21$, $F(5, 66) = 3.40$, $p < .01$), suggesting that the muscularity-oriented sociocultural factors explained a significant amount of variance in body dissatisfaction. Gender minority stressors were entered in Step 2 to assess their added ability to explain variability in body dissatisfaction above and beyond that explained by TI model factors. Consistent with H2Aii, the change in R^2 was significant ($\Delta R^2 = .24$, $F(7, 59) = 3.60$, $p < .01$) meaning that the seven gender minority stressors together accounted for a significant amount of variance in body dissatisfaction that is above and beyond the predictive power of the five TI model factors. When resilience factors were added in Step 3, change in R^2 was not significant ($\Delta R^2 = .03$, $F(2, 57) = 1.46$, $p = .24$), inconsistent with Hypothesis 2Bii, as resilience factors did not incrementally predict body dissatisfaction beyond TI model factors and gender minority stressors.

Tests of hypothesis 3. Two hierarchical multiple regression analyses were performed to evaluate whether factors from the GMSR model added significant predictive power

above and beyond the explanatory power of TI model factors when accounting for variability in disordered eating (H3A and H3B). Across both analyses, the five TI model factors were entered as predictors in the first step, the seven gender minority stressors were added in the second step, and the two resilience factors were entered in the third step. Thinness-oriented TI model factors were evaluated in the first analysis to explain thinness-oriented disordered eating and muscularity-oriented TI model factors were assessed in the second analysis to explain muscularity-oriented disordered eating. See Tables 9 and 10 for a summary of the thinness-oriented and muscularity-oriented disordered eating analyses, respectively.

Table 9

Hierarchical Multiple Regression: TI Factors and GMSR Factors Predicting Thinness-Oriented Disordered Eating

Predictor	r	β	R^2	ΔR^2
Step 1: Tripartite Influence Factors			.58***	.58***
Peer Influences - Thinness	.63***	.30*		
Family Influences –Thinness	.60***	.13		
Media Influences - Thinness	.57***	.26*		
Social Appearance Comparison	.46***	.06		
Body Ideal Internalization – Thinness	.55***	.23*		
Step 2: Gender Minority Stressors			.67***	.09[a]
Discrimination	.43***	.07		
Victimization	.51***	.19		
Rejection	.39***	.01		
Non-Affirmation	.46***	.14		
Internalized Transphobia	.51***	.01		
Negative Expectations	.47***	-.15		
Concealment	.51***	.23		
Step 3: Resilience Factors			.70***	.03[a]
Community Connectedness	-.31**	-.20[a]		
Pride	.27*	.22*		

[a]$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Table 10

Hierarchical Multiple Regression: TI Factors and GMSR Factors Predicting Muscularity-Oriented Disordered Eating

Predictor	r	β	R^2	ΔR^2
Step 1: Tripartite Influence Factors			.65***	.65***
Peer Influences - Muscularity	.69***	.35*		
Family Influences – Muscularity	.65***	.01		
Media Influences - Muscularity	.65***	.25*		
Social Appearance Comparison	.28**	-.10		
Body Ideal Internalization – Muscularity	.71***	.38***		
Step 2: Gender Minority Stressors			.70***	.05
Discrimination	.29**	.18		
Victimization	.38***	.10		
Rejection	.24*	-.22ᵃ		
Non-Affirmation	.35**	.06		
Internalized Transphobia	.37***	.23*		
Negative Expectations	.15	-.15		
Concealment	.26*	-.10		
Step 3: Resilience Factors			.72***	.02
Community Connectedness	-.05	.06		
Pride	.44***	.13		

[a] $p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Incremental utility of GMSR factors beyond thinness-oriented TI factors. In Step 1 of the first regression analysis, there demonstrated a significant overall relationship between the thinness-oriented TI model factors and thinness-oriented disordered eating, $R^2 = .58$, $F(5, 62) = 17.67$, $p < .001$. This indicates that the thinness-oriented TI model factors, taken together, were significantly related to thinness-oriented disordered eating. With the addition of gender minority stressors, the change in R^2 between the first and second steps was non-significant ($\Delta R^2 = .09$, $F(7, 55) = 2.03$, $p = .07$) meaning that, after taking into consideration the variance accounted for by the TI model, the seven gender minority stressors together were not able to explain a significant amount of variability in

thinness-oriented disordered eating. This result is inconsistent with Hypothesis 3Ai.

Between the second and third steps, the change in R^2 was non-significant, $\Delta R^2 = .03$,

$F(2, 53) = 2.87$, $p = .07$. This finding does not suggest that the two resilience factors

account for a significant amount of variance after taking into consideration the predictive

power of both the thinness-oriented TI model and gender minority stressors, a finding

that is inconsistent with H3Bi.

Incremental utility of GMSR factors beyond muscularity-oriented TI factors. Next,

a second regression analysis was performed to evaluate whether considering factors from

the GMSR model would result in a higher proportion of explained variability in

muscularity-oriented disordered eating, above and beyond the predictive power of

muscularity-oriented TI model factors. Muscularity-oriented TI model predictors were

entered in the first step and, taken together, were found to be significantly related to

muscularity-oriented disordered eating ($R^2 = .65$, $F(5, 66) = 24.92$, $p < .001$) accounting

for a large proportion of variance of participants current experiences with muscularity-

oriented disordered eating. Inconsistent with H3Aii, the change in R^2 was not significant

with the addition of gender minority stressors, $\Delta R^2 = .05$, $F(7, 59) = 1.42$, $p = .21$. When

resilience factors were entered in Step 3, the change in R^2 between the second and third

steps was not significant ($\Delta R^2 = .02$, $F(2, 57) = 1.58$, $p = .22$) a finding that is

inconsistent with H3Bii.

Exploratory analyses. I conducted a series of exploratory analyses to further

investigate the relationship between body dissatisfaction and disordered eating in this

sample, after the hypothesized positive correlation between these two constructs was not

found. First, a shape and weight related subscale of the BIQ (cross-product of items 5 – 8; $\alpha = .73$) was created to assess whether results differed when looking at participants' level of dissatisfaction with their shape and weight (e.g., dissatisfaction with chest size) in comparison to their dissatisfaction with all body elements, both shape related and non-shape related (i.e., total scores on the BIQ). Similar to relationships between disordered eating and total body dissatisfaction, zero-order correlations showed no significant relationships between shape/weight related body dissatisfaction and thinness-oriented ($r = .09, p = .40$) and muscularity-oriented ($r = -.05, p = .67$) disordered eating. In replication of previous tests of Hypothesis 2, two hierarchical multiple regression analyses were run with shape/weight related body dissatisfaction as the outcome variable. The pattern of results for shape/weight related body dissatisfaction were consistent with total body dissatisfaction results. Specifically, thinness-oriented TI model factors as a set were not significantly related to shape/weight related body dissatisfaction ($R^2 = .10, F(5, 66) = 1.41, p = .23$), and gender minority stressors ($\Delta R^2 = .22, F(7, 59) = 2.77, p = .02$), but not resilience factors ($\Delta R^2 = .05, F(7, 59) = 2.37, p = .10$), explained an additional amount of variability in participants' responses above and beyond the variance accounted for by the TI model. As well, muscularity-oriented TI model factors explained a significant amount of variance in shape/weight related body dissatisfaction ($R^2 = .16, F(5, 66) = 2.59, p = .03$) and, after taking into account the variance explained by the TI model, the addition of gender minority stressors ($\Delta R^2 = .24, F(7, 59) = 3.32, p < .01$) added additional explained variance; although, resilience factors did not add significant unique variance ($\Delta R^2 = .05, F(2, 57) = 2.80, p = .07$). Overall, results of these

exploratory analyses suggest that the pattern of results does not meaningfully change when considering only shape/weight specific body dissatisfaction in comparison to total body dissatisfaction.

As an additional exploratory aim, a series of independent samples t-tests were conducted to explore group differences in body image, disordered eating, and other gendered constructs among participants with differing gender identities. Differences were tested between transmasculine and transfeminine gender identities only as the group sizes for participants identifying as crossdressers or gender non-binary were small (n = 12 and n = 7, respectively) and therefore underpowered. There demonstrated a statistically significant difference between groups for total body dissatisfaction ($t(72) = 2.45, p = .02$), shape/weight related body dissatisfaction ($t(72) = 2.63, p =.01$), pressures from family to be thin ($t(72) = 2.38, p = .02$), and pressures from the media to be muscular ($t(72) = 2.32, p = .02$). Specifically, transmasculine participants reported higher levels of total body dissatisfaction ($M = 2.11, SD = 1.63$), shape and weight specific body dissatisfaction ($M = 2.99, SD = 2.65$), more experiences with family pressures to obtain a thin body ($M = 6.19, SD = 2.48$), and more media pressures to have a muscular body ($M = 6.26, SD = 2.23$) compared to transfeminine participants ($M = 1.15, SD = 1.69; M = 1.47, SD = 2.31; M = 4.81, SD = 2.44; M = 5.00, SD = 2.29$). No significant mean differences were observed between transmasculine and transfeminine individuals on thinness-oriented disordered eating, sociocultural pressures from peers to be thin or muscular, pressures from family to be muscular, pressures from the media to be thin, or internalization of thin and muscular body image ideals.

Lastly, a chi-square test of independence was conducted to assess group differences in at-risk identity for a clinically significant eating disorder, according to scores on the EAT-26 (Garner et al., 1982). No significant association was observed between gender identity and being considered at risk, $x^2(1) = 1.59$, $p = .21$.

Discussion

The purpose of this study was to evaluate the gender minority stress and resilience model (Hendricks & Testa, 2012; Testa et al., 2015) on its own as well as in combination with the tripartite influence model of body dissatisfaction and disordered eating (Thompson et al., 1999; Tylka, 2011) to better understand disordered eating experiences among GMIs. It was hypothesized that GMSR model factors would not only explain disordered eating among GMIs, but also add incremental predictive power above and beyond the general theoretical model of disordered eating (the TI model). The GSMR model alone explained much of the variance in both thinness-oriented and muscularity-oriented disordered eating (H1A and H1B). Similarly, the TI model alone accounted for a high proportion of variability in both thinness-oriented and muscularity-oriented disordered eating. However, when entered in addition to TI model factors, neither gender minority stressors (H3Ai and H3Aii) nor resilience factors (H3Bi and H3Bii) explained additional unique variance in thinness-oriented or muscularity-oriented disordered eating, inconsistent with expectations.

As the TI model posits that sociocultural pressures and internalization factors influence disordered eating through body dissatisfaction, relationships between the two models and body dissatisfaction were also evaluated. Consistent with the TI model, muscularity-oriented TI model factors as a set explained a significant amount of variability in body dissatisfaction. Unexpectedly, thinness-oriented factors did not add significant predictive value, a finding that contrasts with the tripartite influence theoretical framework. When added to TI model factors, gender minority stressors were

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able to explain a significant proportion of total variance in body dissatisfaction above and beyond the variance accounted for by thinness-oriented (H2Ai) and muscularity-oriented (H2Aii) TI model factors; however, the addition of resilience factors did not add significant predictive value in either model (H2Bi and H2Bii).

Notably, body dissatisfaction and disordered eating experiences were not significantly related to each other in this sample, a finding which contrasts markedly with many prior studies employing the TI model which have shown a strong, positive correlation with both thinness-oriented (de Carvalho, Alvarenga, & Ferreira, 2017; Johnson, Edwards, & Gidycz, 2015; Lovering et al., 2018; Rodgers, Chabrol, & Paxton, 2011; Slevec & Tiggemann, 2011) and muscularity-oriented (Girard, Charbrol, & Rodgers, 2018; Tylka, 2011; Tylka & Andorka, 2012) disordered eating. One potential explanation for the lack of significant relationships observed between disordered eating and body dissatisfaction may be due potential biases in the present sample (e.g., selection bias). For example, participants in this study were self-selected as the sample consisted of individuals who chose to complete surveys using Qualtrics Survey Panels and who chose to participate in the present survey; therefore, the present sample may not be representative of the entire population. Alternatively, this lack of significant relationship may be explained as a population difference, such that the relationship between body dissatisfaction and disordered eating may simply be different for gender minority persons compared to relationships observed for cisgender persons. Future research is needed to clarify the link between body dissatisfaction and disordered eating for gender minority persons.

Lastly, it should also be noted that across these six regression analyses, the importance of each individual predictor could not be clearly identified. This may be due to multicollinearity among the study predictors (i.e., unique contributions were not clearly discernable due to large correlations among model factors) as well as due to complex intercorrelations of linear combinations of the predictors. However, results do speak to each of the two models' overall abilities to explain disordered eating and body dissatisfaction experiences for gender minority participants.

TI Model, GMSR Model, and Relationships with Disordered Eating

In the present study, the majority of associations observed between the theoretical constructs and both muscularity-oriented and thinness-oriented disordered eating aligned with each of the two theoretical paradigms. First, all TI model factors were strongly positively associated with disordered eating, a finding that has been demonstrated in samples of predominantly heterosexual adult women (Lovering et al., 2018), a general sample of adult men (Tylka, 2011), adult gay men (Tylka & Andorka, 2012), and adult lesbian and bisexual women (Hazzard et al., 2019). Correlations among the TI model factors also aligned with theory as study results showed positive interrelations, suggesting that the more sociocultural pressures a person experienced, the more likely that person was to also report high levels of body image internalization and physical appearance comparisons. These results suggest that exposure to sociocultural body image pressures and subsequent internalization of these messages play significant roles in shaping GMIs' risk for disordered eating. Notably, the majority of TI model factors showed no meaningful relationship with body dissatisfaction, a factor posited to be a key mediator

within the TI model (Thompson et al., 1999; Tylka, 2011). Body dissatisfaction was not closely related to thinness-oriented or muscularity-oriented disordered eating, in contrast with the TI model and numerous studies in cisgender populations (de Carvalho, Alvarenga, & Ferreira, 2017; Rodgers, Chabrol, & Paxton, 2011; Stice & Shaw, 2002; Thompson et al., 1999; Tylka, 2011).

Taken together, these findings suggest that many aspects of the TI model may be useful in understanding disordered eating among GMIs, but that adaptations to existing models may be necessary. Namely, findings suggest that the TI model's assertion of body dissatisfaction as a key proximal determinant of disordered eating may not apply well to GMIs. Future research could test this conclusion using a series of mediation analyses, evaluating body dissatisfaction as a mediating factor between TI model internalization factors and disordered eating. A small number of prior studies have directly tested the link between body dissatisfaction and disordered eating among GMIs; however, research is scarce and has been limited to only thinness-oriented disordered eating. Of these available studies, researchers have reported a strong positive relationship between thinness-oriented disordered eating and body dissatisfaction among transgender women (Brewster, Velez, Breslow, & Geiger, 2019), a non-significant relationship among transgender men (Velez, Breslow, Brewster, Cox, & Foster, 2016), and a strong negative association between thinness-oriented disordered eating and body satisfaction among a sample including both transgender men and women (Testa et al., 2017b). Taking into consideration prior work, present results highlight the need for additional targeted

research to help elucidate the relationship between body dissatisfaction and disordered eating among GMIs.

Second, the majority of relationships observed between the GMSR model factors and disordered eating were as expected, but the relationships between resilience and disordered eating deviated from theory. In line with predictions, gender minority stressors and resilience factors as a set were able to explain a large proportion of variance in participants' experiences with thinness-oriented and muscularity-oriented disordered eating, 59% and 42% respectively. Moreover, it was observed that more experiences with distal and proximal gender minority stress were related to more thinness-oriented and muscularity-oriented disordered eating, a finding that is consistent with limited previous research which has demonstrated positive relationships between thinness-oriented disordered eating and distal minority stressors, including gender-based discrimination (Brewster et al., 2019; Velez et al., 2016) and non-affirmation (Testa et al., 2017b). While the literature on the relationships between minority stress and disordered eating remains scarce, prior work has identified similar positive relationships between gender minority stressors and negative mental health outcomes, including depression (Brennon et al., 2017), anxiety (Chodzen, Hidalgo, Chen, & Garofalo, 2019), and suicidality (McNeil, Ellis, & Eccles, 2017; Testa et al., 2017a).

Data was mixed with regard to the GMSR model's predictions regarding resilience factors. Community connectedness was found to be negatively associated with thinness-oriented disordered eating, a result that aligns with the GMSR model. However, inconsistent with expectations, no significant relationship was observed with muscularity-

oriented disordered eating or body dissatisfaction. Unexpectedly, I found that higher rates of pride in one's gender minority identity were associated with *higher* rates of disordered eating, inverse to what would be expected given the GMSR model. One potential explanation for this deviation may be that the more pride an individual has in their gender identity, the more they internalize society's women-centric or male-centric body image standards which then leads to more disordered eating. The present study found evidence of each of these individual relationships (e.g., pride was positively related to thin body ideal internalization which was positively related to thinness-oriented disordered eating); however, future research is needed to directly test the potential mediating role of body image internalization.

Regarding the role of resilience, prior work assessing the application of the GMSR model to other mental health outcomes have also reported similar deviations from the theoretical paradigm. Looking at the effect of resilience on GMIs mental health experiences, Bockting and colleagues (2013) found no significant direct effects or moderating effects of gender identity pride on the relationship between stigma (i.e., minority stress) and mental health, although peer support from other transgender persons (i.e., community connectedness) did moderate these relationships. As well, prior work applying the GMSR model in the context of depression reported no significant moderating effects of pride or community connectedness (Jaggi et al., 2018).

Overall, previous research has shown disordered eating to be prevalent among GMIs, yet our empirical understanding of the mechanisms underlying disordered eating development in this population is limited (Jones et al., 2016). Study findings suggest that

both interpersonal and intrapersonal minority stressors and sociocultural influence factors are important contributors to disordered eating development, although the role of gender minority specific resilience remains unclear. Results provide preliminary evidence for the application of minority stress and tripartite influence theories in the context of understanding disordered eating etiology among GMIs; although, adaptations to the existing models may be necessary.

Integration of the Two Models in Explaining Disordered Eating

Similar to Testa and colleagues' (2017a) suicidal ideation findings, this study found that the integration of the population-specific and general theoretical factors explained a larger proportion of variance in disordered eating experiences compared to the population-specific model on its own. Specifically, the integration of the TI and GMSR models better explained thinness-oriented (70% variance explained) and muscularity-oriented (72% variance explained) disordered eating experiences compared to the GMSR model alone. Contrary to expectations, after taking into account TI model factors' explanatory power, gender minority stressors and resilience factors did not add significant predictive value in explaining thinness-oriented and muscularity-oriented disordered eating. This result suggests that, although GMSR model factors explain a large proportion of variability as evidenced in prior regression analyses, their explanatory power overlaps significantly with the explanatory power of the TI model.

Although the addition of GMSR model factors did not add unique predictive power, it is important to note that this does not mean that gender minority stressors and resilience factors are not important to consider. This study showed that the two models were related

to each other, as evidenced by their significant interrelations (see Table 4). These findings indicate that GMI's individual differences in resiliency as well as their experiences with gender minority stress may be influential in shaping their experiences with Western society's body image messages and the internalization of these body image ideals. Said a different way, present results support the importance of taking into account how gender minority stressors and resilience factors intersect with GMI's experiences with society's body-specific pressures and personal body image ideals, while also signifying that TI model factors play the central role in determining disordering eating in this population. This may be seen as somewhat expected, as the TI model takes into consideration factors that are unique to disordering eating, whereas the GMSR model represents an etiological framework of psychological distress in general.

TI Model, GMSR Model, and Relationships with Body Dissatisfaction

Body dissatisfaction findings deviated from what was expected. As noted previously, the majority of direct relationships observed between the TI model and body dissatisfaction were non-significant, a finding that is inconsistent with the proposed theoretical framework which describes body dissatisfaction as being a central proximal factor in the model. Interestingly, when looking at the combined explanatory power of the TI model factors, regression analysis revealed that muscularity-oriented TI model factors taken together explained a significant amount of the variance in body dissatisfaction (21 percent explained). This finding is unexpected given the lack of significant individual relationships between the TI model and body dissatisfaction. Therefore, results should be interpreted with caution as this finding is most likely a

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statistical artifact resulting from issues with multicollinearity among TI model predictors. In contrast to predictions of the TI model, this study found that thinness-oriented TI model factors were unable to explain a significant amount of variability in body dissatisfaction (13% variance explained). Importantly, the addition of gender minority stressors added significant explanatory power to the both the thinness-oriented and muscularity-oriented models, with gender minority stress accounting for the majority of the explained variability. This finding highlights the detrimental impact distal and proximal gender minority stressors have on GMIs risk of developing dissatisfaction with their body.

Further, although the integrated model explained a significant proportion of variability in body dissatisfaction, it is important to note that more than half of the variance remained unexplained. This suggests that there are additional factors outside of the two etiological models that are important to consider when working to understand GMIs experiences with body dissatisfaction. Future research should consider the role of gender-affirming medical interventions (GAMIs) as an additional determinant of body dissatisfaction. Multiple prior studies have found GAMIs to be associated with increases in body satisfaction among GMIs (for a review see Jones et al., 2016); although, research evaluating relationships between GAMIs and other determinants of body dissatisfaction (i.e., the TI and GMSR models) is limited. As well, further studies should explore additional sources of sociocultural pressures that may exert influence on GMIs to adopt a specific-body image ideal. For example, research has found evidence of a positive relationship between body image pressures from romantic partners and body

dissatisfaction in samples of presumed heterosexual adult men (Tylka, 2011), heterosexual adult women (Johnson, Edwards, & Gidycz, 2015), and gay men (Tylka & Andorka, 2012); however, this relationship has not been evaluated for GMIs. Lastly, body ideal messages from strangers may also play a significant role in influencing GMIs levels of body dissatisfaction. People interact with other people, who are part of their network and others who are strangers, on a daily basis and these interactions are influential. Therefore, it highly likely that messages from members outside of a gender minority person's social network (e.g., a person walking by on the street, a friend of a friend on Instagram) play a role in shaping their personal body image ideals and perceptions of their body.

Gender Identity Differences in Muscularity and Thinness-Oriented Variables

Exploratory analyses revealed differences between transmasculine and transfeminine individuals in terms of their experiences with thinness-oriented and muscularity-oriented factors. Specifically, we found that transmasculine participants experienced more pressures from their family to obtain a thin body, more pressure from the media to be muscular, and higher levels of body dissatisfaction in comparison to transfeminine participants. In contrast to these findings, Vocks and colleagues' (2009) found no differences between transgender men and transgender women in terms of body dissatisfaction experiences. Alternatively, Bandini and colleagues' (2013) reported that transgender women who had not had GAMIs, classified by authors as "sex reassignment surgery (SRS)", demonstrated higher levels of body uneasiness in comparison to transgender men who had no SRS procedure.

Limitations and Future Directions

The present study quantitatively evaluated two etiological models of disordered eating among GMIs. Overall, study findings provide preliminary evidence supporting the application of both GMSR model in addition to its' integration with the TI model in understanding disordered eating development among GMIs. Despite these novel findings, there exist limitations of this study which are important to note. First, the present study was cross-sectional in design and consequently, study results cannot determine causality. Both the GMSR model and TI model represent causal theories, therefore longitudinal research is needed to provide direct evidence of causal relationships among the model factors. As well, given my research aims were focused on understanding the added value of the GMSR model factors above and beyond the value of TI model, model factors were sequentially added based on which theoretical framework the factor was associated with (i.e., TI model factors entered in Step 1, GMSR model factors entered in Steps 2 and 3) and were not entered in relation to their theorized temporal relationships (i.e., interpersonal factors lead to increases in intrapersonal factors, resulting in more disordered eating). Due to this research design choice and statistical approach, it remains unknown how the factors of the two models interrelate to cause disordered eating in this population. Second, convenience sampling was employed to recruit study participants through an online platform, thus participants may not be representative of all gender minority persons. Lastly, sample size was limited in the present study and in response, I combined all gender minority participants into a single category which is not the best standard practice. By combining all GMIs into a single "gender minority" category (a

term used to encompass a diverse range of gender identities/expressions), researchers lose out on important information relating to the unique experiences of individuals with differing gender identities and expressions. For example, the US Trans Survey (2015) found differences in the frequency of family rejection (i.e., a distal minority stressor) between people with different identities, such that transgender men (55%) and transgender women (63%) experienced more rejection than gender non-binary persons (32%) and those identifying as crossdressers (38%). Future research employing a larger sample is needed to confirm study interpretations and to investigate differences among individuals with differing gender identities and expressions.

Although this study exhibits limitations, findings provide preliminary support for the application and integration of both the GMSR and TI models in understanding GMIs experiences with disordered eating. Therefore, this work can provide the basis for future studies to build upon. First, the present study demonstrated evidence supporting the application of the GMSR model; although, questions still remain as to how each of the seven gender minority stress and two resilience factors interrelate to impact GMIs risk of developing disordered eating. Further studies could be conducted to assess each individual pathway proposed within the GMSR model (e.g., gender-related victimization leads to increased internalized transphobia resulting in increased disordered eating).

Second, while results suggest the TI model in general is an appropriate framework to help researchers understand disordered eating experiences among GMIs, adaptations to the model may be necessary. Specifically, study findings suggest that body dissatisfaction, a central construct within the TI model, may not relate to disordered

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eating in the same way that has been observed in cisgender populations. Future research is needed to clarify the role of body dissatisfaction in relation to disordered eating among gender minority persons. In addition, further research is needed to assess the validity of each theorized pathway within the model (e.g., peer pressures to be thin leads to increases in social appearance comparison, resulting in increased and disordered eating). Future studies should examine each of these proposed pathways outlined in the TI model to determine whether these factors relate similarly to those relationships observed in cisgender populations.

Lastly, study findings demonstrated that the integration of the GMSR and TI models, broadly speaking, is useful for understanding disordered eating experiences among GMIs; however, it remains unclear how factors of the GMSR model interact with factors of the TI model to cause disordered eating. Said differently, the present study is only demonstrative of the general ability of all TI and GMSR model factors, taken together, to explain disordered eating, leaving specific pathways between factors (e.g., gender related discrimination to physical appearance comparison to disordered eating) unknown. Further studies could examine the directionality of associations between the TI and GMSR model factors to create a more specified understanding of disordered eating etiology in this population.

Clinical Implications

Study results suggest gender minority individuals are at high risk for developing problems with disordered eating. In this study, 41 percent of participants were considered at-risk for a clinically significant eating disorder, demonstrating a figure much larger than

previously reported (22 percent; Testa et al., 2017b). Therefore, it is important that clinicians are aware of this high risk of eating psychopathology when working with gender minority clients.

Overall, study findings suggest that gender minority stressors and sociocultural influences may put GMIs at increased risk for developing disordered eating, and, therefore may be useful indicators for potential targets in future interventions. It is important that clinicians be aware of their clients' experiences with these interpersonal and intrapersonal factors, and work with their client to explore how these factors influence their body perceptions and eating behaviors.

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