

Online Supplemental Material for manuscript “Gender Nonconformity and Minority Stress among Lesbian, Gay, and Bisexual Individuals: A Meta-Analytic Review”

Results

Inclusion of transgender individuals as a moderator

Initially, we examined whether effect sizes differed if transgender individuals were included in the results reported within each study. Four eligible studies included transgender individuals in their samples (Levitt, Puckett, Ippolito, & Horne, 2012; Mustanski & Liu, 2013; Quinn et al., 2015; Toomey, Ryan, Diaz, Card, & Russell, 2010), and we examined moderation effects of associations between gender nonconformity and prejudice events and internalized homonegativity, as multiple studies examined these stressors while including transgender individuals (three reporting on prejudice events and two reporting on internalized homonegativity; see Table S2). Results indicated that studies including transgender individuals reported effect sizes of greater magnitude for the association between gender nonconformity and prejudice events ($Q = 4.34$, $df = 1$, $p = 0.037$) and gender nonconformity and internalized homonegativity ($Q = 17.51$, $df = 1$, $p < 0.0001$). Given that including transgender individuals in reported results led to differences in effect sizes for these stressors, studies that included transgender individuals in their samples were excluded from the remainder of analyses.

Examination of Publication Bias

Tests of publication bias within each model indicated publication bias did not significantly influence published results. Within analyses examining the association between prejudice events and gender nonconformity, Begg and Mazumdar’s rank correlation test suggested there was no association between standard errors of estimates and effect sizes ($p = 0.06$). We also conducted Duval and Tweedie’s trim and fill method to impute effect sizes for potentially missing studies due to publication bias, add them to the analysis, and then recompute

the overall effect size (Duval & Tweedie, 2000). Three imputed values were added to the analysis, and re-estimated results indicated the initial effect was not due to publication bias ($r = 0.17$; $CI = 0.15 - 0.20$). Publication status did not moderate the association between prejudice events and gender nonconformity.

Within analyses examining the association between concealment/disclosure and gender nonconformity, Begg and Mazumdar's rank correlation test suggested there was no association between standard errors of estimates and effect sizes ($p = 1.00$). Similarly, no values were imputed within Duval and Tweedie's method, indicating results were not influenced by publication bias. Similarly, publication status did not moderate the association between concealment/disclosure and gender nonconformity.

Within analyses examining the association between internalized homonegativity and gender nonconformity, Begg and Mazumdar's rank correlation test suggested there was no association between standard errors of estimates and effect sizes ($p = 0.70$). Similarly, no values were imputed within Duval and Tweedie's method, indicating results were not influenced by publication bias. Publication status could not be examined as a moderator because no identified unpublished works measured the association between gender nonconformity and internalized homonegativity.

Within analyses examining the association between expectations of rejection and gender nonconformity, Begg and Mazumdar's rank correlation test suggested there was no association between standard errors of estimates and effect sizes ($p = 0.30$). Duval and Tweedie's trim and fill method added two imputed values to the analysis, and re-estimated results indicated the initial effect was not due to publication bias ($r = 0.12$; $CI = 0.07 - 0.16$). Publication status could not be examined as a moderator because no identified unpublished works measured the

association between gender nonconformity and expectations of rejection.

Discussion

More rigorous assessment of minority stress should be implemented

The current study's literature review revealed that limited and inconsistent measurement of minority stress processes have inhibited prior work examining minority stress among LGB individuals, including associations between minority stress and gender nonconformity. Prejudice events have been measured most frequently and reliably, with approximately half of the included studies using a measure which had been developed and/or validated in prior work. However, almost every included study used a different scale to assess prejudice events with only a few studies using common measures. Furthermore, multiple studies assessed prejudice events using just one item for each domain of mistreatment, which is an insufficient approach to capture the diverse distal minority stress experiences of LGB individuals. Among proximal stressors, internalized homonegativity was measured with the most consistency, as several studies used empirically supported measures developed in prior research (Meyer, 1995; Shidlo, 1994). The majority of studies examining concealment and disclosure did not use measures which had been previously validated, and expectations of rejection were measured with disparate assessments designed to assess related constructs, including rejection sensitivity, anxiety about gay-related social interactions, and public self-consciousness about sexual orientation. The empirical literature examining minority stress among LGB individuals would benefit from more rigorous measurement of minority stress processes. While researchers have begun to develop reliable and valid measures which encompass all aspects of minority stress (Goldbach, Schragar, & Mamey, 2017), future work should aim to develop and validate additional measures of minority stress within large, diverse samples of LGB individuals. Finally, researchers must ensure validated

measurements of minority stress are widely disseminated and implemented into health science research with LGB individuals, as this will enable researchers to accurately and succinctly capture experiences of minority stress and compare their results to other samples.

Researchers should devote additional resources to examining gender expression and minority stress among transgender individuals

Studies which included transgender individuals in their samples reported larger magnitude effect sizes for the associations between gender nonconformity and prejudice events and internalized homonegativity when compared to studies not including transgender individuals. These results indicate findings documenting the associations between gender nonconformity and minority stress among cisgender LGB individuals might not generalize to transgender individuals, and gender nonconformity and minority stress likely function differently among transgender people. First, transgender individuals report higher levels of gender nonconformity than cisgender LGB individuals (Toomey et al., 2010), and transgender individuals undergo a gender transition where their gender expression, and subsequent conformity to their gender assigned at birth, often varies over time (Olson, Durwood, DeMeules, & McLaughlin, 2016). Second, transgender individuals experience unique prejudice events compared to cisgender LGB individuals, including institutional discrimination that makes it difficult to obtain legal documents with the correct gender identity and name as well as lack of access to safe public restrooms and locker rooms (Hill et al., 2018; Murchison, Agénor, Reisner, & Watson, 2019; Weinhardt et al., 2017). In addition, transgender individuals experience nonaffirmation of their gender identity, including being “misgendered” by others using pronouns or other terms that do not coincide with their current gender identity (McLemore, 2018; Testa, Habarth, Peta, Balsam, & Bockting, 2015). Finally, for transgender individuals who undergo a

social or medical gender transition, the issue of concealment and disclosure of gender identity is altered fundamentally over the course of their transition (Testa et al., 2015). For these reasons, examining associations between gender nonconformity and minority stress within mixed samples of cisgender LGB individuals and transgender individuals could lead to biased results. Studies with sufficient subsample sizes of transgender individuals are needed to conduct separate analyses to examine how gender expression and minority stress are related among transgender individuals.

Table S1: Search terms used to identify potentially eligible manuscripts.

Recommended search terms used to identify studies of lesbian, gay, and bisexual individuals (used in each search)	(bisexual OR bisexuality OR bisexuals OR gay OR gays OR GLB OR GLBT OR homosexual OR homosexualities OR homosexuality OR homosexuality OR homosexuals OR lesbian OR lesbianism OR lesbians OR LGB OR LGBT OR "men who have sex with men" OR msm OR queer OR "sexual minorities" OR "sexual minority" OR "sexual orientation" OR "women loving women" OR "women who have sex with women" OR WSW)
Terms to identify papers examining gender nonconformity and prejudice events	(discriminat* OR victimiz* OR prejudic* OR mistreatment OR maltreatment OR "enacted stigma") AND ("gender variance" OR "gender nonconformity" OR "gender non-conformity" OR "gender nonconforming" OR "gender non-conforming" OR "gender conforming" OR "gender conformity" OR "gender diverse" OR "gender atypical" OR "gender typical" OR "gender expression")
Terms to identify papers examining gender nonconformity and concealment/disclosure	(disclos* OR conceal* OR "come out" OR "coming out" OR "outness" OR "openness") AND ("gender variance" OR "gender nonconformity" OR "gender non-conformity" OR "gender nonconforming" OR "gender non-conforming" OR "gender conforming" OR "gender conformity" OR "gender diverse" OR "gender atypical" OR "gender typical" OR "gender expression")
Terms to identify papers examining gender nonconformity and internalized homonegativity	("internalized homophobia" OR "internalized homonegativity" OR "internalized heterosexism" OR "internalized sexual stigma") AND ("gender variance" OR "gender nonconformity" OR "gender non-conformity" OR "gender nonconforming" OR "gender non-conforming" OR "gender conforming" OR "gender conformity" OR "gender diverse" OR "gender atypical" OR "gender typical" OR "gender expression")
Terms to identify papers examining gender nonconformity and expectations of rejection	("expectations of rejection" OR "expecting rejection" OR "felt stigma" OR "rejection sensitivity" OR "attachment anxiety" OR "social interaction anxiety" OR "safety fears") AND ("gender variance" OR "gender nonconformity" OR "gender non-conformity" OR "gender nonconforming" OR "gender non-conforming" OR "gender conforming" OR "gender conformity" OR "gender diverse" OR "gender atypical" OR "gender typical" OR "gender expression")

Figure S1: Flowchart depicting number of studies identified, screened, reviewed, and included in analyses, including reasons for exclusion.

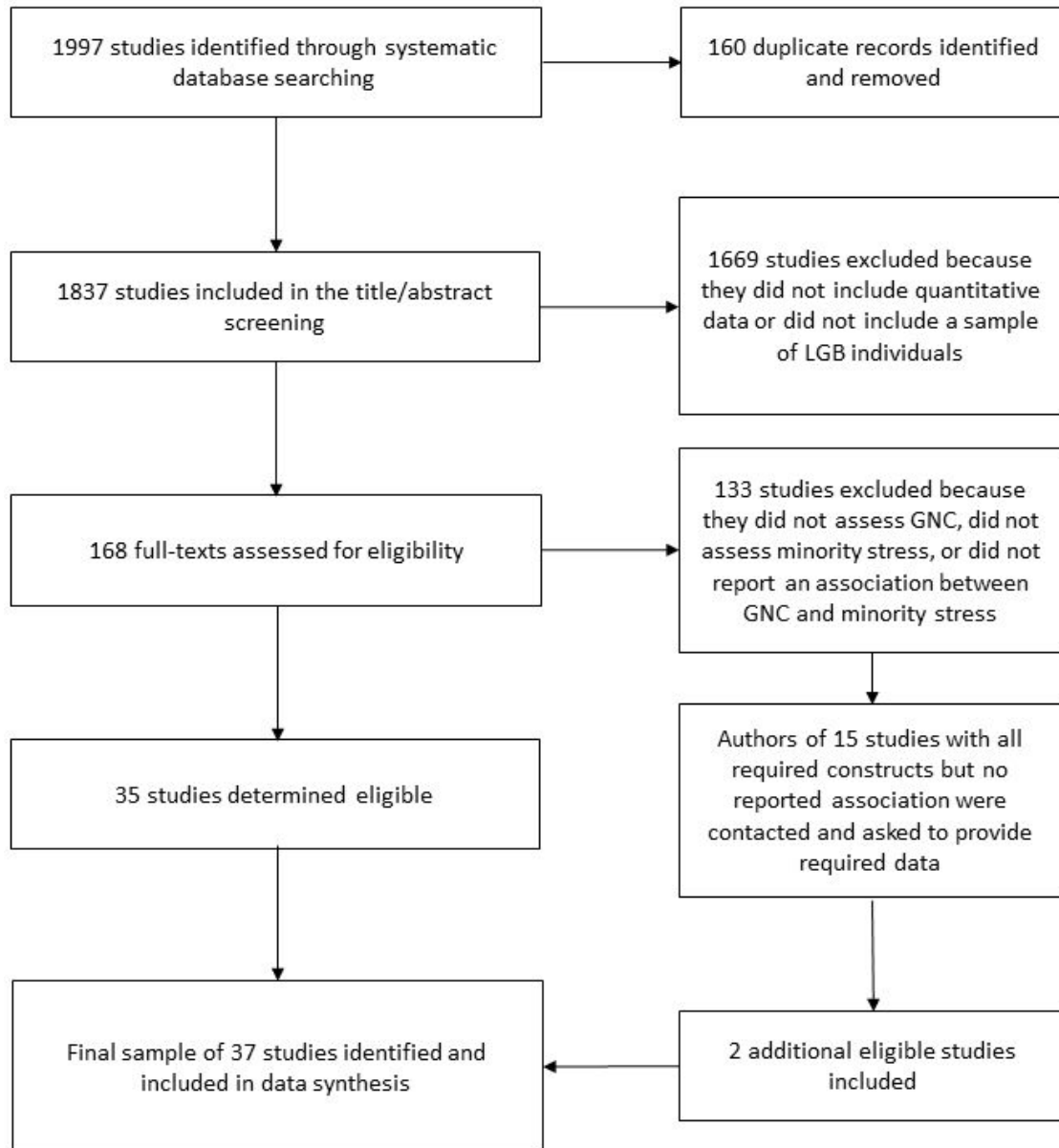


Table S2: Descriptive statistics, study characteristics, and effect sizes for studies that included transgender participants within their samples.

	Study	Prejudice Events Correlation Coefficient	Prejudice Events Coefficient 95% Confidence Interval	Internalized Homonegativity Correlation Coefficient	Internalized Homonegativity Coefficient 95% Confidence Interval	Concealment Correlation Coefficient	Concealment Coefficient 95% Confidence Interval	Total Sample Size	Mean Age	Adolescent vs. Adult	Measure of Gender Nonconformity	Gender	Country
1	Levitt (2012)	0.164	0.083, 0.242	-0.122	-0.202, -0.041	0.242	0.164, 0.317	563	31.9	Adult	Current	F	USA/Canada
2	Mustanski (2013)	0.340	0.222, 0.448	--	--	--	--	237	18.76	Adult	Childhood	C	USA
3	Quinn (2015)	--	--	-0.246	-0.333, -0.155	--	--	427	27.4	Adult	Current	M	USA
4	Toomey (2010)	0.330	0.214, 0.437	--	--	--	--	245	22.8	Adult	Childhood	C	USA
	Average	0.243	0.186, 0.299	-0.176	-0.235, -0.115			368	25.22				

Notes: -- Information was not provided in manuscript; M: results separately reported for men; F: results separately reported for women; C: only results combined for men and women reported.

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