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## Gender Nonconformity and Minority Stress among Lesbian, Gay, and Bisexual Individuals: A Meta-Analytic Review

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### Abstract

Lesbian, gay, and bisexual (LGB) individuals are less healthy than heterosexual individuals, and minority stress endured by LGB individuals contributes to these health disparities. However, within-group differences in minority stress experiences among LGB individuals remain underexplored. Individuals are more likely to be categorized as LGB if they exhibit gender nonconformity, so gender nonconformity could influence concealability of sexual orientation among LGB individuals, carrying important implications for the visibility of their stigmatized sexual orientation identity and for how they experience and cope with minority stress. Through a meta-analytic review, the current study examined how gender nonconformity was associated with minority stress experiences among LGB individuals. Thirty-seven eligible studies were identified and included in analyses. Results indicate gender nonconformity is associated with experiencing more prejudice events, less concealment of sexual orientation, lower internalized homonegativity, and higher expectations of rejection related to sexual orientation among LGB individuals. Gender nonconformity is more strongly associated with experiencing prejudice events among gay and bisexual men than among lesbian and bisexual women. Gender nonconformity is systematically associated with minority stress experiences among LGB individuals, and future research must measure and examine gender nonconformity when investigating the role of minority stress in degraded health outcomes among LGB populations.

### Introduction

Lesbian, gay, and bisexual (LGB) individuals are more likely to have degraded health across the lifespan than heterosexual individuals (Graham et al., 2011). LGB youth and adolescents have higher rates of suicidality, depression, and substance use than their heterosexual peers (Graham et al., 2011; Marshal et al., 2011; Marshal et al., 2008). Mental health disparities persist into adulthood, and LGB adults experience anxiety, depression, and suicidality at higher rates than heterosexual individuals (Graham et al., 2011; King et al., 2008). Gay and bisexual men also bear a disproportionate burden of the current HIV epidemic in the United States (Dailey et al., 2017), and high prevalence of HIV infection among gay men is synergistically associated with degraded mental health outcomes in this population (Bränström & Pachankis, 2018). Finally, LGB adults report poorer overall physical health as compared to heterosexual individuals (Graham et al., 2011; Lick, Durso, & Johnson, 2013).

Experiences of minority stress contribute to health disparities between LGB and heterosexual individuals (Meyer, 1995, 2003). Minority Stress Theory posits that LGB individuals encounter stress within their social environments in the form of prejudice events based upon known or perceived sexual orientation, and LGB people internalize negative societal and cultural messages about their minority group (Meyer, 1995, 2003). Meyer (2003) theorizes that minority stressors fall into two distinct categories: distal stressors and proximal stressors. Distal stressors include experiences and perceptions of anti-gay prejudice events within a person's social environment (Meyer, 2003). Prejudice events can include verbal harassment, physical violence, property crimes, housing or employment discrimination, and sexual assault (Katz-Wise & Hyde, 2012). Proximal minority stressors are internal processes that can be harmful to LGB individuals, including internalized homonegativity, expectations of rejection within social interactions, and concealment of sexual orientation from others (Meyer, 2003). LGB individuals with higher levels of internalized homonegativity report more negative attitudes about themselves because they are LGB (DiPlacido, 1998; Meyer, 2003; Shidlo, 1994). LGB individuals also often perceive the social environment around them as hostile toward LGB people, and they may expect more frequent rejection or mistreatment by others based on this belief (Meyer, 2003; Pachankis, Goldfried, & Ramrattan, 2008).

Sexual orientation has been previously conceptualized as a concealable stigmatized identity, and the stigmatized minority status of some LGB individuals might not be readily apparent in social interactions (Pachankis, 2007; D. M. Quinn & Chaudoir, 2009). Thus, LGB individuals often must decide when to conceal and disclose their sexual orientation to others and may have to repeatedly disclose their minority status, causing additional stress (Meyer, 2003; Pachankis, 2007). While related, concealment and disclosure are separate processes which contribute to minority stress in distinct ways (Meidlinger & Hope, 2014). LGB individuals may be at increased risk for experiencing prejudice events if they disclose their sexual orientation within social contexts. However, concealment of sexual orientation can exert an emotional and cognitive toll, as LGB individuals who conceal their identity more frequently report higher psychological distress and depressive symptoms (Leleux-Labarge, Hatton, Goodnight, & Masuda, 2015; Riggle, Rostosky, Black, & Rosenkrantz, 2017; Schrimshaw, Siegel, Downing Jr, & Parsons, 2013). Individuals who conceal a stigmatized identity often do so to increase their sense of belonging, but research indicates that concealing this information can actually reduce feelings of belonging because individuals perceive themselves to be inauthentic and disclose less information about themselves overall (Newheiser & Barreto, 2014). Finally, individuals might experience more felt stigma when they conceal their sexual orientation, as others they interact with could make rejecting comments about sexual minority individuals more freely without knowing they are interacting with an LGB individual (Bry, Mustanski, Garofalo, & Burns, 2017).

In addition to documented associations between concealment and mental health, mounting evidence supports all four tenets of Meyer's Minority Stress Theory. LGB individuals who experience more frequent prejudice events and perceive high levels of discrimination report compromised mental and physical health outcomes (for reviews see Lick et al., 2013; Pascoe & Smart Richman, 2009). Similarly, adults who endorse high levels of internalized

homonegativity have poorer mental health outcomes and adolescents with high levels of internalized homonegativity report higher levels of substance use (Berg, Munthe-Kaas, & Ross, 2016). While examined less frequently, LGB individuals are more likely to report negative mental health outcomes if they expect rejection from others (Feinstein, Goldfried, & Davila, 2012; Pachankis & Goldfried, 2006; Puckett, Maroney, Levitt, & Horne, 2016).

Although Minority Stress Theory helps us to understand why LGB individuals exhibit stark and widespread health disparities as compared to heterosexual individuals, within-group differences in minority stress experiences among LGB individuals remain underexplored within the empirical literature (Graham et al., 2011; Hatzenbuehler, 2009). This is a critical limitation of the existing literature, as current theoretical and conceptual approaches to LGB health take a “one size fits all” approach which assumes that all LGB individuals experience minority stress in the same way. Developing a more thorough understanding of within-group differences in minority stress experiences is of paramount importance, as this knowledge would inform more sophisticated theoretical models of minority stress, enable identification of LGB individuals most at risk for distress and subsequent degraded health outcomes, and improve intervention and prevention efforts to improve health within this population. The primary goal of the current study is to examine how gender nonconformity, a key personal characteristic which has been identified as a potential predictor of minority stress experiences among LGB individuals (Oost, Livingston, Gleason, & Cochran, 2016), is associated with minority stress experiences reported by LGB individuals.

### **Gender nonconformity among LGB individuals**

An individual’s gender expression includes gender-related characteristics of their appearance, behaviors, and interests, and gender nonconformity is characterized by gender expression which does not conform to societal expectations of an individual’s gender assigned at birth. Gender nonconformity often consists of aspects of appearance, behaviors, or interests exhibited by an individual who identifies with one gender identity which are typically considered to be characteristic of another gender identity (e.g. a man with a higher-pitched voice, a woman who dresses in masculine clothing). In addition, other distinctive social cues which are not common for individuals identifying with a particular gender identity can be identified by others as gender nonconforming (e.g. a man who speaks with a lisp (Mack & Munson, 2012)).

On average, LGB individuals exhibit higher levels of gender nonconformity than heterosexual individuals (Bailey & Zucker, 1995; Plöderl & Fartacek, 2009; Rieger, Linsenmeier, Gygax, & Bailey, 2008). Researchers have demonstrated this pattern of findings is robust, as LGB individuals are less conforming to gender expression norms both during childhood and adulthood (Rieger et al., 2008), and sexual orientation-group differences in gender nonconformity have persisted over decades and continue to be reported in recent studies (Jones, Robinson, Oginni, Rahman, & Rimes, 2017; Li, Kung, & Hines, 2017).

We will describe three key ways in which gender nonconformity functions among LGB individuals, including how gender nonconformity is related to minority stress experiences: 1) Gender nonconformity allows for social categorization of LGB individuals as stigmatized

minority members within social contexts; 2) Gender nonconformity holds value within the LGB community, protecting against stress in some circumstances; and 3) Gender nonconformity influences the salience of sexual orientation within the larger identities of LGB individuals. The goal of this discussion is to both summarize the multiple functions of gender nonconformity among LGB individuals and to arrive at hypotheses for how each minority stressor will be associated with gender nonconformity among LGB individuals.

### **Gender nonconformity, social categorization, and distal minority stress among LGB individuals**

Social categorization into groups occurs automatically as individuals attend to relatively infrequent, distinctive, or novel characteristics of others within social contexts (Oakes, Turner, & Haslam, 1991). People are categorized into a specific social group if their characteristics evidence good fit with a perceiver's preconceived notions of how individuals within that social group look and behave (Oakes et al., 1991).

Research has demonstrated that the more easily and confidently an individual can be identified as a stigmatized minority group member within social contexts, the more prejudice events they will experience. For example, African Americans with darker skin tone perceive more discrimination than African Americans with lighter skin tone (Adams, Kurtz-Costes, & Hoffman, 2016; Keith, Nguyen, Taylor, Mouzon, & Chatters, 2017; Klonoff & Landrine, 2000; Monk Jr, 2015; Uzogara & Jackson, 2016; Uzogara, Lee, Abdou, & Jackson, 2014). In a parallel manner, gender nonconformity has high potential to identify individuals within a stigmatized sexual minority group. Individuals use gendered appearance and behavior cues to categorize others into sexual orientation groups (Rieger, Linsenmeier, Gygax, Garcia, & Bailey, 2010; Rule, Ambady, Adams Jr, & Macrae, 2008). Studies have shown that only brief videos of behavior (Ambady, Hallahan, & Conner, 1999; Johnson, Gill, Reichman, & Tassinari, 2007), audio samples of voice (Fasoli, Maass, Paladino, & Sulpizio, 2017; Gaudio, 1994; Linville, 1998; Munson, 2007; Munson & Babel, 2007), and pictures of faces (Ambady et al., 1999; Freeman, Johnson, Ambady, & Rule, 2010; Rule et al., 2008; Tskhay, Feriozzo, & Rule, 2013) may be sufficient to accurately categorize sexual orientation. In laboratory studies, ratings of gender nonconformity and categorizations of sexual orientation are highly correlated (Munson, 2007; Rieger et al., 2010; Smyth, Jacobs, & Rogers, 2003), and judgments of sexual orientation become more accurate as gender nonconformity increases (Johnson et al., 2007).

While researchers have reported consistent associations between gender nonconformity and social categorization of sexual orientation, this link could be strongest among men. Researchers have theorized that masculinity constitutes a precarious social construct which is defined through social processes (Vandello, Bosson, Cohen, Burnaford, & Weaver, 2008), and men must conform to narrow societal expectations to meet masculine ideals (Vandello et al., 2008). This idea is supported by studies of gender nonconformity during childhood, as boys who exhibit gender nonconformity are more likely to encounter negative reactions from peers (Blakemore, 2003) and parents (Kane, 2006) than girls who are gender nonconforming. Furthermore, gender nonconforming appearance and mannerisms are perceived more negatively than minority sexual orientation among adolescent boys

(Horn, 2007). Researchers have also pointed to gender nonconformity among men as a more prominent source of psychosocial stress relative to gender nonconformity among women, as gender nonconformity is associated with negative mental health outcomes more strongly among men than among women (Petterson, VanderLaan, & Vasey, 2017; Roberts, Rosario, Slopen, Calzo, & Austin, 2013).

In summary, gender nonconformity among LGB individuals is predictive of accurate categorization to a stigmatized sexual minority group within social contexts. Just as certain physical characteristics are associated with experiences of discrimination among racial/ethnic minority individuals, LGB individuals will likely experience higher levels of distal minority stress in the form of anti-gay prejudice events if they exhibit gender nonconformity because their stigmatized identity will be more apparent to individuals within diverse social contexts.

### **The social value of gender nonconformity within the LGB community**

Gender nonconformity is not only a concept by which heterosexual individuals enact stigma against LGB individuals; gender nonconformity could influence interactions LGB individuals have with their own community members. Studies have shown that gender conformity is more desirable within the LGB community, as LGB individuals find gender conformity more attractive in a partner (Sánchez, Greenberg, Liu, & Vilain, 2009) and, among men who have sex with men, dominant sexual behaviors are less stigmatized (Hoppe, 2011) and masculinity is a desirable trait in romantic partners (Bailey, Kim, Hills, & Linsenmeier, 1997). Thus, LGB individuals, especially gay and bisexual men, who exhibit high gender nonconformity may experience rejection within the LGB community.

At the same time, gender nonconformity has consistent benefit by signifying sexual orientation to others and, subsequently, facilitating easier identification of fellow community members (Johnson et al., 2007). Individuals who are gender nonconforming, by virtue of their visibility, often have an easier time being identified by and integrated into LGB communities (Clarke & Turner, 2007). Because of this greater connection to the LGB community, LGB individuals who are gender nonconforming likely access and connect with LGB peers and community resources more easily and frequently. Closer ties to the LGB community could confer protective properties against minority stress, as researchers have indicated that affiliation with the LGB community is negatively associated with internalized homonegativity (Frost & Meyer, 2009). Thus, LGB individuals exhibiting high levels of gender nonconformity could be protected against high levels of internalized homonegativity when compared to their more gender conforming peers.

### **Gender nonconformity, salience of sexual orientation, and proximal minority stress experiences among LGB individuals**

While gender nonconformity likely exacerbates the potential for experiencing distal minority stressors among LGB individuals, gender nonconformity could also contribute to intrapersonal processes within this population by influencing proximal minority stressors, including expectations of rejection, internalized homonegativity, and concealment of sexual

orientation. Gender nonconformity could shape the salience of sexual orientation identity among LGB individuals, which could then predict proximal minority stress experiences.

The salience of sexual orientation identities likely varies among LGB individuals based on their level of gender nonconformity. Salience of social identities has been defined as the probability that any given social identity will be invoked within particular social contexts (Hogg, Terry, & White, 1995; Stryker & Serpe, 1982, 1994). More recently, researchers have operationalized the salience of social identities as how aware an individual is of a social identity within social contexts (D. M. Quinn et al., 2014; Wang, Douglass, & Yip, 2017). As reviewed above, gender nonconformity predicts whether other individuals within a social context will categorize LGB individuals as sexual minorities, so it is possible that gender nonconformity could be associated with the likelihood that an individual's sexual orientation will be invoked within social contexts.

This possibility has several implications for the experiences of proximal minority stressors. LGB individuals who exhibit high levels of gender nonconformity and have a salient sexual orientation identity could anticipate prejudice events more frequently than individuals with lower gender nonconformity, as individuals with high gender nonconformity might be more aware of their sexual orientation within interactions and might assume that others will accurately perceive their sexual orientation. In addition, gender nonconformity could also predict higher levels of expected rejection because elevated past experiences of prejudice events secondary to gender nonconformity increase these expectations for future mistreatment.

LGB individuals also might disclose more frequently or broadly across social contexts if they exhibit gender nonconformity and, thus, experience their sexual orientation as more salient. This pattern of disclosure could emerge both because individuals are more frequently aware of their sexual orientation across social contexts and feel obligated to disclose, or individuals could disclose more freely because they anticipate they will be categorized as a sexual minority individual regardless of their own disclosure. On the other hand, LGB individuals who are more gender conforming may choose to disclose their orientation less frequently or withhold this information completely within certain social contexts because they do not experience their orientation as a salient social identity across all social contexts. They also may be able to more effectively conceal their identity within social contexts, as other individuals will not categorize them as LGB based on fewer gender nonconformity cues within their appearance and behaviors.

Finally, researchers have reported salience of social identities prospectively predicts how much an individual will explore and develop that identity (Wang et al., 2017). Thus, LGB individuals with highly salient sexual orientation identities likely explore their identity earlier in development and more frequently. Researchers have noted that identity development progress among LGB individuals, including integration of sexual orientation into a larger self-concept, is negatively associated with internalized homonegativity (Rowen & Malcolm, 2003; Wells & Hansen, 2003). While gender nonconformity could exacerbate some minority stress experiences among LGB individuals, gender nonconformity could also be predictive of lower levels of internalized homonegativity.

## The Current Study

The primary aim of this study was to examine how gender nonconformity is associated with experiences of minority stress among LGB individuals. Each of the four domains of minority stress described by Meyer were examined separately. It was hypothesized that higher levels of gender nonconformity would be associated with higher levels of disclosure of sexual orientation (or lower levels of concealment), more frequent experiences of prejudice events, higher expectations of rejection, and lower levels of internalized homonegativity. Given the evidence that gender nonconformity and minority stress could be differentially associated among men and women, a secondary goal was to examine differences in the magnitude of associations between gender nonconformity and minority stressors among gay and bisexual men versus lesbian and bisexual women. We hypothesized that gender nonconformity would be more strongly associated with minority stress experiences among gay and bisexual men.

## Method

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed for this study (Moher, Liberati, Tetzlaff, Altman, & Group, 2009).

## Selection of Studies

There were two main inclusion criteria: studies that 1) reported a statistical test of the relation between gender nonconformity and at least one measure of minority stress and 2) included LGB participants, defined using measures of self-identified sexual orientation, same-sex attraction, and/or same-sex sexual behavior. Using these criteria, studies were identified for analyses in four steps. First, systematic searches of three large, comprehensive databases of empirical literature (PsycINFO, PubMed/MEDLINE, and Academic Search Premier) were conducted using a combination of key terms on January 21, 2020 to search for studies published prior to December 31, 2019. Search terminology recommended for identification of LGB health research was used (Lee, Ylloja, & Lackey, 2016), along with a number of combinations of key terms to identify studies which measured both gender nonconformity and at least one minority stressor (see Table S1 in Supplemental Material available online). A total of 1997 works were identified using these search terms, and 160 of these results were identified as duplicates. Titles and abstracts of the remaining 1837 works were subsequently reviewed by authors to determine if they potentially met criteria. Second, the full texts of 168 manuscripts identified above were retrieved and reviewed to confirm their eligibility. Third, full texts were then read in detail and their citation lists were reviewed to identify any studies that may meet review criteria but were not identified within database search. Using these methods, a total of 35 studies were identified that met inclusion criteria (all studies included in analyses have been marked with an asterisk in the References list). Fourth, first authors of all eligible studies were contacted via email to ask for their help in identifying published or unpublished studies that met our inclusion criteria. In addition, first authors of studies which collected data on gender nonconformity and minority stress but did not provide enough information in their manuscript to be included were contacted, and two additional manuscripts were added to our pool of eligible studies using these methods (K. Quinn et al., 2015; Liam Timmins, Rimes, & Rahman, 2018). The final sample of 37

studies reported a total of 127 effect sizes representing tests of associations between gender nonconformity and minority stressors (see Figure S1 in the Supplemental Material available online). Our final sample of studies included six unpublished works which were not peer reviewed, including four dissertations (Bui, 2009; Cannon, 2006; McCutcheon, 2018; Snell, 2018) and two reports of data from LGB adolescents in the United States (Kosciw, Greytak, Giga, Villenas, & Danischewski, 2016; Kosciw, Greytak, Palmer, & Boesen, 2014).

### Coding of Studies

Two reviewers read all eligible studies and extracted relevant qualitative and quantitative data from each study. Effect sizes were extracted separately for associations between each minority stressor and gender nonconformity. Gender identity information (male vs. female) was coded for each effect size when reported to examine this moderator. Studies were also coded to indicate whether they included transgender participants in their sample. Because transgender individuals report higher levels of gender nonconformity than cisgender LGB individuals and experience minority stressors that are unique to their stigmatized gender identity (Hendricks & Testa, 2012; Toomey, Ryan, Diaz, Card, & Russell, 2010), inclusion of transgender participants was examined as a moderator (see below). Additionally, age of sample (categorized as adolescent [mean age under 18] or adult [mean age over 18]), study design (cross-sectional or longitudinal), and timeframe of gender nonconformity measure (childhood or current) were extracted to conduct exploratory analyses to examine whether these variables moderated associations between minority stressors and gender nonconformity. All studies reported cross-sectional associations between gender nonconformity and minority stressors, so study design could not be examined as a moderator. Finally, publication status (published or unpublished work) was examined as a moderator to determine if publication bias influenced results. A total of 1086 individual pieces of data were extracted from manuscripts, and interrater agreement was 92%. Within quantitative data, the intra-class correlation indicated excellent reliability (0.98). All discrepancies were resolved by consensus between the two raters, including the first author.

### Operationalization of variables

Measures of minority stress varied widely across eligible studies and few standardized measures were used. Each effect size was coded as one of four minority stressors, including 1) prejudice events, 2) concealment/disclosure, 3) internalized homonegativity, and 4) expectations of rejection. Prejudice events effects included measures of physical mistreatment and violence, verbal harassment, and aggregated discrimination or victimization scales. While the majority of studies used multiple item scales to assess prejudice events, four studies assessed experiencing prejudice events with single item measures (Bui, 2009; D'Augelli, Grossman, & Starks, 2006; Kosciw et al., 2016; Kosciw et al., 2014). Concealment/disclosure was measured with items that assessed either general openness about sexual orientation or openness to specific groups, such as family or friends. Three studies measured specific concealment behaviors, including "covering" sexual orientation (Pachankis & Bernstein, 2012). To measure internalized homonegativity, two studies used the personal homonegativity subscale of the Revised Homosexual Attitude Inventory (Shidlo, 1994), one used the internalized homonegativity subscale of the Lesbian,



Gay, and Bisexual Identity Scale (Mohr & Fassinger, 2000), and four used the Internalized Homophobia Scale (Wright, Dye, Jiles, & Marcello, 1999). Expectations of rejection were measured with a few related constructs, including expectations of prejudice, rejection sensitivity, fear of negative evaluation, attachment anxiety, and public self-consciousness.

Nineteen studies measured gender nonconformity during childhood, 17 measured current gender nonconformity, and one included measures of both childhood and current gender nonconformity. The most common measures of gender nonconformity included adaptations of the Boyhood Gender Conformity Scale (Hockenberry & Billingham, 1987), the Childhood Gender Nonconformity Scale (Lippa, 2008), and measures of femininity and/or masculinity. All gender nonconformity measures were coded such that higher scores indicate higher gender nonconformity (i.e. more gender atypical appearance or behavior; more femininity for male participants).

### Data analysis plan

First, we examined inclusion of transgender individuals in reported results as a moderator using the method described below to determine if these studies could be combined with other studies reporting results from only cisgender LGB individuals. Results indicated larger effect sizes within studies including transgender individuals (Levitt, Puckett, Ippolito, & Horne, 2012; Mustanski & Liu, 2013; K. Quinn et al., 2015; Toomey et al., 2010), so these four studies were excluded from analyses (full results, including Table S2, are described in Supplemental Material available online). Second, overall effects for associations between minority stressors and gender nonconformity were estimated separately for each minority stressor. Effects were estimated by combining weighted effects across all studies assuming a random effects model (Borenstein, Hedges, Higgins, & Rothstein, 2010). Third, diagnostics were performed on each set of analyses to identify potential outlier effect sizes, publication biases, and other threats to statistical conclusion validity of the results (no evidence of publication bias was detected in analyses; see Supplemental Material available online for publication bias results). Fourth, moderators of overall effects were examined using a Q statistic which tests for heterogeneity across moderator subgroups, and between group effects were calculated assuming subgroup categories were fixed. All analyses were conducted using Comprehensive Meta Analysis, Version 3.3 (Borenstein, Hedges, Higgins, & Rothstein, 2012). The majority of studies measured both minority stressors and gender nonconformity using continuous measures, so results are reported using a Pearson correlation coefficient effect size metric.

## Results

### Prejudice events and gender nonconformity

Our final pool of studies included 25 studies examining the association between gender nonconformity and a measure of prejudice events, and these studies included 71 separate effect size estimates. Studies yielded multiple effect size estimates because they reported on associations between gender nonconformity and multiple prejudice events measures, included effect sizes for multiple subgroups, or both. Two studies reported results for the whole sample and men and women separately (Baams, Beek, Hille, Zevenbergen, & Bos,

2013; Van Beusekom, Bos, Overbeek, Kuyper, & Sandfort, 2018), and we retained the separate effect sizes for men and women to facilitate subgroup comparisons. Other studies included results reporting a total or global prejudice events score as well as results for specific scales within that measure (Cannon, 2006; D'Augelli, Pilkington, & Hershberger, 2002; Pilkington & D'Augelli, 1995; Plöderl & Fartacek, 2009), and we retained effect sizes for total or global scores only in these cases. After removing redundant effect sizes, 47 were included in analysis. Eleven studies reported associations between gender nonconformity and more than one measure of prejudice events, and multiple effect sizes within these studies were combined using recommended methods which account for dependency within the data (Borenstein et al., 2010). Thus, one weighted effect size estimate is reported in Table 1 and Figure 1 for each study.

The overall weighted effect size for the association between gender nonconformity and prejudice events was  $r = 0.19$  (95% CI = 0.16 – 0.21) and was significantly different from zero ( $z = 13.32, p < 0.0001$ ). Study-level effect sizes ranged from 0.04 to 0.37. When the overall effect was recalculated with one study removed, the estimated effect sizes ranged from 0.18 to 0.19, and all of the overall estimated effect sizes remained significant.

Results indicated that gender moderated the association between gender nonconformity and prejudice events ( $Q = 32.57, df = 1, p < 0.0001$ ). To examine gender as a moderator, study-level effect sizes were computed for all studies conducted among individuals of one gender and gender subgroup-level effect sizes were computed within three studies that reported results for gay and bisexual men and lesbian and bisexual women separately (Baams et al., 2013; Plöderl & Fartacek, 2009; Van Beusekom et al., 2018). While gender nonconformity was associated with prejudice events among both gay and bisexual men ( $r = 0.24, CI = 0.20 - 0.27, z = 12.17, p < 0.0001$ ) and lesbian and bisexual women ( $r = 0.09, CI = 0.05 - 0.13, z = 3.95, p < 0.0001$ ), the effect was significantly stronger among gay and bisexual men. In addition, use of a measure of childhood gender nonconformity resulted in larger effect sizes than use of a measure of current gender nonconformity ( $Q = 5.14, df = 1, p = 0.023$ ). Age of sample did not moderate the association between gender nonconformity and prejudice events.

### **Concealment/disclosure and gender nonconformity**

We analyzed data from 13 studies reporting on an association between gender nonconformity and a measure of concealment or disclosure, and these studies each included one effect size each. Two studies were determined to be using the same dataset but reporting on a different measure of concealment/disclosure within that dataset (Pachankis & Bernstein, 2012; Pachankis, Westmaas, & Dougherty, 2011), so results from these two studies were combined into one effect size in analyses. Concealment/disclosure associations were all coded such that higher scores reflected higher levels of disclosure and lower levels of concealment. The overall weighted effect size for the association between gender nonconformity and concealment/disclosure was  $r = 0.15$  (CI = 0.11 – 0.20) and was significantly different from zero ( $z = 6.34, p < 0.0001$ ) (see Table 2 and Figure 2). Study-level effect sizes ranged from 0.03 to 0.39. When the overall effect was recalculated with one study removed, the estimated effect sizes ranged from 0.14 to 0.16, and all of the overall

estimated effect sizes remained significant. Results indicated that gender, age of sample, and timeframe of gender nonconformity measure did not moderate the association between gender nonconformity and concealment/disclosure.

### Internalized homonegativity and gender nonconformity

Fourteen studies reported an association between internalized homonegativity and gender nonconformity, and these studies included 18 total effect sizes. One study reported results for the whole sample and men and women separately, and we retained the separate effect sizes for men and women to facilitate subgroup comparisons (Van Beusekom et al., 2018). One study reported associations between internalized homonegativity and both childhood gender nonconformity and current gender expression (D'Augelli, Grossman, & Starks, 2008), and these associations were aggregated into one effect size within analysis. One study included two separate scales measuring internalized homonegativity (Sandfort, Bos, Knox, & Reddy, 2016), and these associations were aggregated into one effect size within analysis. The overall weighted effect size for the association between gender nonconformity and internalized homonegativity was  $r = -0.09$  (CI =  $-0.14 - -0.03$ ) and was significantly different from zero ( $z = -3.04$ ,  $p = 0.002$ ) (see Table 3 and Figure 3). Study-level effect sizes ranged from  $-0.35$  to  $0.19$ . When the overall effect was recalculated with one study removed, the estimated effect sizes ranged from  $-0.10$  to  $-0.07$ , and all of the overall estimated effect sizes remained significant. Results indicated that timeframe of gender nonconformity measurement moderated the association between gender nonconformity and internalized homonegativity ( $Q = 45.66$ ,  $df = 1$ ,  $p < 0.0001$ ). The pooled effect size of studies using current gender nonconformity measurements was significant ( $r = -0.12$ , CI =  $-0.15 - -0.09$ ,  $z = -7.48$ ,  $p < 0.0001$ ) while no association was found within studies using a childhood measure of gender nonconformity ( $r = 0.02$ ,  $z = 1.58$ ,  $p = 0.113$ ). Gender and age of sample did not moderate the association between gender nonconformity and internalized homonegativity.

### Expectations of rejection and gender nonconformity

Nine studies reported an association between expectations of rejection and gender nonconformity, and these studies included 12 separate effect sizes. Three studies included two separate scales measuring expectations of rejection (Pachankis & Goldfried, 2006; Liam Timmins et al., 2018; Liadh Timmins, Rimes, & Rahman, 2019), and these associations were aggregated into one effect size within analysis. The overall weighted effect size for the association between gender nonconformity and expectations of rejection was  $r = 0.13$  (CI =  $0.09 - 0.18$ ) and was significantly different from zero ( $z = 5.48$ ,  $p < 0.0001$ ) (see Table 4 and Figure 4). Study-level effect sizes ranged from  $0.01$  to  $0.26$ . When the overall effect was recalculated with one study removed, the estimated effect sizes ranged from  $0.12$  to  $0.15$ , and all of the overall estimated effect sizes remained significant.

Results indicated that gender moderated the association between gender nonconformity and expectations of rejection ( $Q = 7.80$ ,  $df = 1$ ,  $p = 0.005$ ). While gender nonconformity was associated with expectations of rejection among men ( $r = 0.19$ , CI =  $0.12 - 0.26$ ,  $z = 5.33$ ,  $p < 0.0001$ ), there was no significant association in the one study of women (Everett, Steele, Matthews, & Hughes, 2019). Timeframe of gender nonconformity measure did not moderate

the association between gender nonconformity and expectations of rejection. Finally, no studies with a sample under 18 examined expectations of rejection, so this moderator could not be assessed.

## Discussion

Gender nonconformity is associated with minority stress experiences among LGB individuals. Individuals who reported higher levels of gender nonconformity also reported more experiences of prejudice events, less concealment and broader disclosure of their sexual orientation, lower levels of internalized homonegativity, and higher expectations that they would be rejected by others across included studies. Taken together, these results indicate that gender nonconformity is a key psychosocial construct in determining how LGB individuals interact with and experience their social contexts. Results also indicate gender nonconformity could have a more influential role in the minority stress experiences of gay and bisexual men as compared to lesbian and bisexual women. Given its associations with minority stressors within the existing literature, gender nonconformity could have important associations with a broad set of health outcomes within LGB populations. Measures of gender nonconformity should be included in future studies examining health outcomes among LGB individuals, especially studies designed to investigate the role of minority stress in perpetuating health disparities between LGB and heterosexual individuals.

## Recommendations for future research

Below, we provide recommendations for how findings from our systematic review and meta-analysis can inform and stimulate future investigations examining how gender nonconformity influences both minority stress experiences and health among LGB individuals (see Supplemental Material available online for additional recommendations about measurement of minority stress and research with transgender individuals).

## Studies of LGB minority stress and health disparities must measure gender nonconformity

Because gender nonconformity is associated with minority stress experiences among LGB individuals and sexual minority individuals exhibit higher levels of gender nonconformity, it is plausible that variability in minority stress resulting from unmeasured gender nonconformity is being attributed to sexual orientation in some prior work. This is supported by research indicating that gender nonconformity is negatively associated with indices of well-being above and beyond sexual orientation, while sexual orientation is not associated with well-being after accounting for variability attributed to gender nonconformity (Rieger & Savin-Williams, 2012). Furthermore, researchers have demonstrated that prejudice events due to gender nonconformity mediate the association between sexual minority status and depressive symptoms, with prejudice due to gender nonconformity being more strongly linked to depressive symptoms than prejudice due to sexual orientation (Martin-Storey & August, 2016). Taken together, this evidence indicates that gender nonconformity is likely a central social determinant of experiences of minority stress among LGB individuals, and it is imperative that future studies measure gender nonconformity to examine its influence on experiences of minority stress within LGB populations.

**Researchers should attend to different associations between gender nonconformity and minority stress among gay and bisexual men versus lesbian and bisexual women**

—As hypothesized, the association between gender nonconformity and experiences of prejudice events was significantly stronger among gay and bisexual men as compared to lesbian and bisexual women. Similarly, we found that gender nonconformity was positively associated with expectations of rejection among gay and bisexual men but was unassociated among lesbian and bisexual women. However, only one study separately examined this stressor among women. Researchers have previously theorized that men are granted less latitude with regard to socially acceptable gendered behaviors and appearance when compared to women (Vandello et al., 2008), and the current meta-analysis provides empirical support for this theory among LGB individuals. Importantly, there is evidence that gender nonconformity is more strongly associated with negative mental health outcomes among gay men than among lesbian women (Skidmore, Linsenmeier, & Bailey, 2006). Thus, degraded mental health outcomes among gay and bisexual men could be more strongly predicted by gender nonconformity, which precipitates more frequent and intense experiences of prejudice events, when compared to their lesbian and bisexual female peers. Future investigations should make efforts to measure gender nonconformity and minority stress and to report results separately for gay and bisexual men and lesbian and bisexual women.

**Researchers should examine minority stress as a mediator of associations between gender nonconformity and health outcomes**

—Minority stress experiences have been strongly linked to health outcomes among LGB individuals in prior research (Pascoe & Smart Richman, 2009), and the results of the present meta-analysis indicate gender nonconformity could be indirectly linked to health among LGB individuals via minority stress experiences. While more frequent experiences of prejudice events among LGB individuals with high gender nonconformity could place them at risk for experiencing adverse health outcomes, gender nonconformity could also serve as a buffer against degraded health in other ways. Results indicate gender nonconformity is negatively associated with internalized homonegativity and concealment of sexual orientation, potentially providing LGB individuals with high gender nonconformity with more intrapersonal and interpersonal resources they can utilize to defray the stress of experiencing prejudice events. Gender nonconforming LGB individuals could be more strongly connected to the broader LGB community, allowing them to effectively process and cope with stress related to prejudice experiences by connecting with others who have had similar minority stress experiences (Shilo, Antebi, & Mor, 2015).

Only four studies in our final pool of studies examined how minority stress experiences mediate associations between gender nonconformity and health outcomes among LGB individuals. All four of these studies found that gender nonconformity was associated with greater experiences of prejudice events or expectations of rejection, and these stressors were in turn associated with poorer mental health (Feinstein et al., 2012; Puckett et al., 2016; Liadh Timmins et al., 2019; Van Beusekom et al., 2018). Additionally, a study of Dutch LGB adults found that gender nonconformity was associated with more positive mental health among men via lower internalized homonegativity, supporting the potential protective

role of gender nonconformity as it relates to internalized homonegativity (Van Beusekom et al., 2018). Importantly, all four of these studies were conducted with cross-sectional datasets, limiting our ability to draw causal conclusions. While gender nonconformity could play a key role in mental health disparities among LGB individuals given its associations with all aspects of minority stress experiences in this population, more studies, including those using longitudinal datasets, must examine minority stressors as mediators of the associations between gender nonconformity and health.

**Gender nonconformity could have utility as an early indicator of risk for development of mental health problems**—Gender nonconformity could also have utility in examining the early development of mental health problems, particularly among LGB individuals. Researchers have reported that mental health disparities between LGB adolescents and their heterosexual peers already exist at the age of 13 (Marshal et al., 2013). This age precedes identification with sexual minority identities for the majority of LGB adolescents (Martos, Nezhad, & Meyer, 2015), making it impossible for researchers to intervene and prevent mental health problems among LGB individuals before they develop. However, many LGB adolescents could have less traditional gender expression earlier in development and throughout childhood, and researchers could include individuals who will later go on to identify as LGB by conducting studies of children while oversampling children who exhibit high levels of gender nonconformity.

Additionally, gender nonconforming children experience more stress during childhood, and these experiences could have negative downstream effects across development. Researchers have demonstrated that children with high gender nonconformity experience higher rates of parent and peer rejection (Landolt, Bartholomew, Saffrey, Oram, & Perlman, 2004), and individuals who are gender nonconforming during childhood experience higher rates of physical and sexual abuse (Roberts, Rosario, Corliss, Koenen, & Austin, 2012). Increased experiences of stress throughout childhood could calibrate the hypothalamic-pituitary-adrenal axis to be more physiologically reactive to stress (Knack, Jensen-Campbell, & Baum, 2011; Miller, Chen, & Zhou, 2007; Tarullo & Gunnar, 2006). For LGB adolescents, this combination of physiological vulnerability to stress developed during childhood as well as frequent and intense experiences of minority stress beginning in adolescence once they identify as LGB could create a “perfect storm” leading to the onset and maintenance of disproportionate levels of mental health problems during adolescence and into adulthood.

While this developmental biopsychosocial pathway could apply particularly well to the experiences of LGB individuals, this hypothesis is relevant for any individual with high gender nonconformity during childhood, regardless of whether they go on to identify as LGB. Gender nonconformity during adolescence is associated with experiencing bullying regardless of sexual orientation (Gordon et al., 2018), and gender nonconformity is associated with poorer mental health outcomes for all individuals. Examining gender nonconformity during childhood has the potential to allow researchers to conduct focused investigations of social and biological risk factors for onset of later mental health problems.

## Limitations

The present results must be interpreted within the context of methodological limitations. Additional research is needed on some of the minority stressors assessed, especially expectations of rejection. Since so few studies have examined associations between gender nonconformity and expectations of rejection, there was no variability to examine some moderators of interest in our analyses for this stressor. Additionally, every included study used a cross-sectional sample to examine the association between gender nonconformity and minority stress. Given this limitation, we cannot rule out the possibility that minority stress experiences predict future manifestations of gender expression. For example, it is possible that LGB individuals who experience less shame and external prejudice could feel less pressure to adapt their gender-related behavior and conform to societal gender norms. Longitudinal study designs would allow researchers to examine more comprehensively how gender nonconformity is associated with minority stress over time, as well as how associations between gender nonconformity and health outcomes could be mediated by minority stress experiences. Using commonly accepted effect size metrics (Higgins, Thompson, Deeks, & Altman, 2003), all effects within the current meta-analysis were small in size. Other within-group characteristics, such as bisexuality, rurality, and race/ethnicity, likely predict variability in minority stress experiences among LGB individuals as well (Balsam, Molina, Beadnell, Simoni, & Walters, 2011; Durso & Meyer, 2013; Feinstein & Dyar, 2017; Fox, Choukas-Bradley, Salk, Marshal, & Thoma, 2020; Swank, Frost, & Fahs, 2012).

## Conclusions

Gender nonconformity is systematically associated with minority stress experiences among LGB individuals. The results of the present meta-analysis indicate that future LGB health research must measure and examine gender nonconformity within these populations, as it could play a key role in the minority stress experiences and subsequent health outcomes among LGB individuals. LGB individuals exhibiting high gender nonconformity could be at increased risk for negative health outcomes because they experience more frequent prejudice events and have higher expectations for rejection. However, gender nonconformity could also play a protective role in the health of LGB individuals, as higher levels of gender nonconformity were found to be associated with lower levels of internalized homonegativity. Thorough future examinations of associations between gender nonconformity, minority stress, and health outcomes need to implement reliable and valid measurement of gender nonconformity and minority stress, and longitudinal study designs would facilitate investigation of how gender nonconformity is predictive of minority stressors and health outcomes over time.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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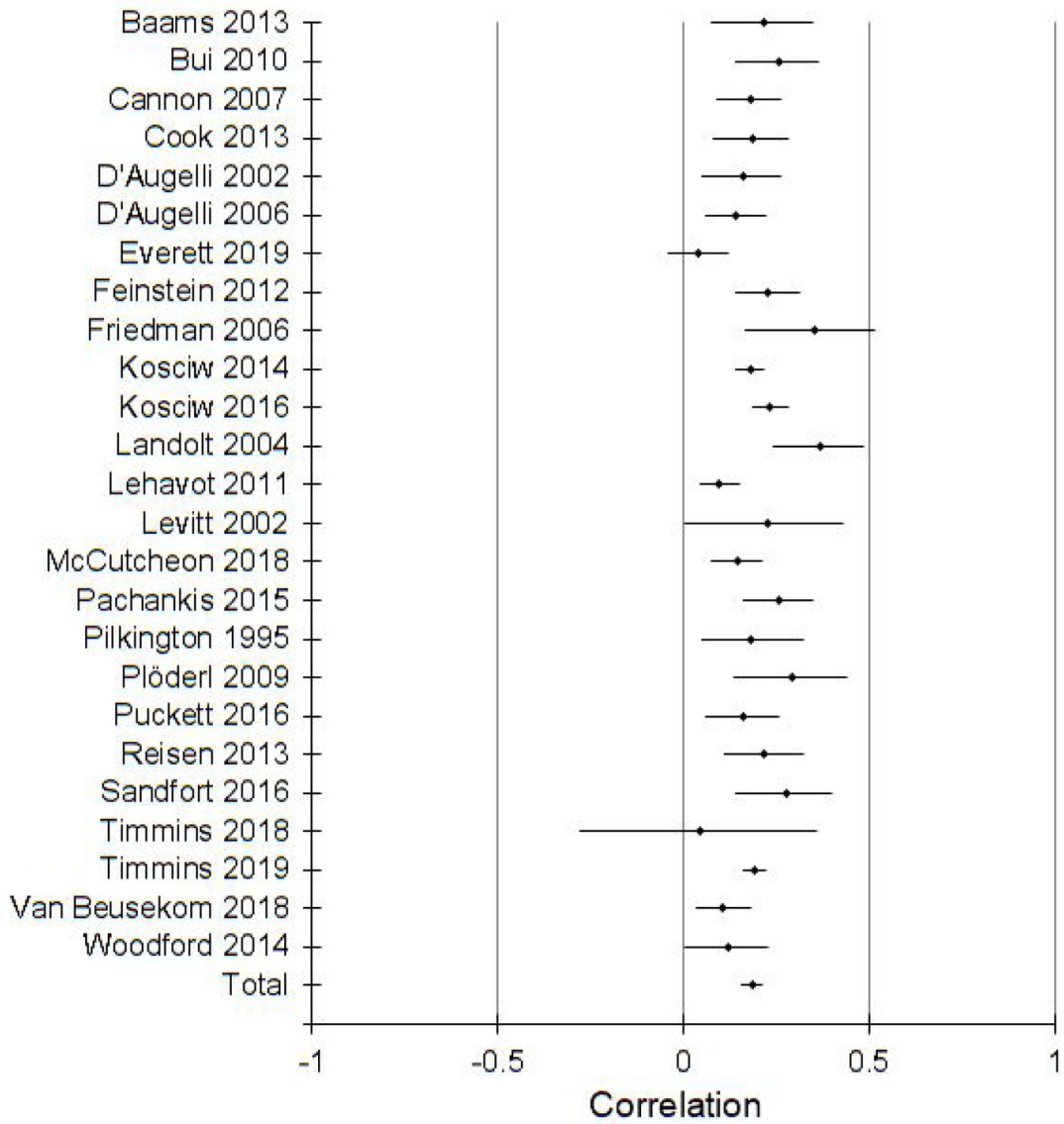
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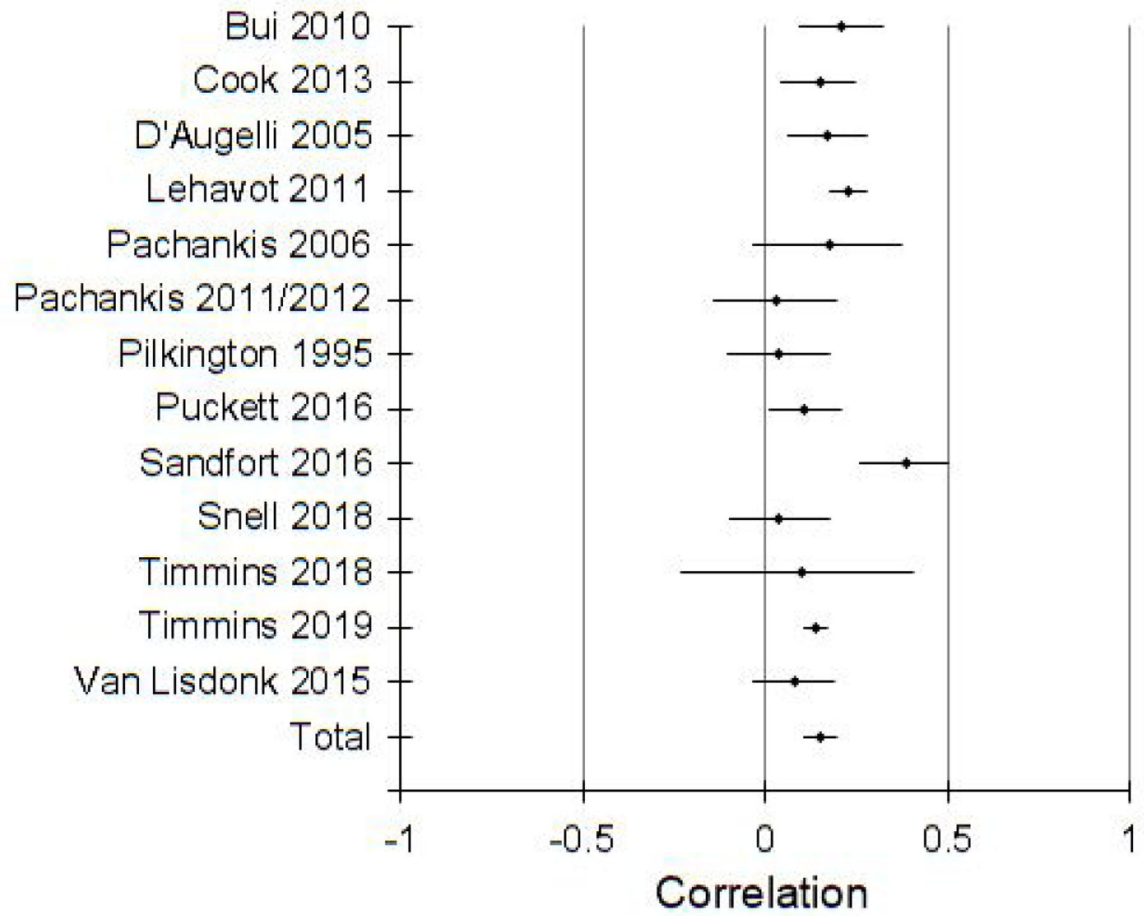
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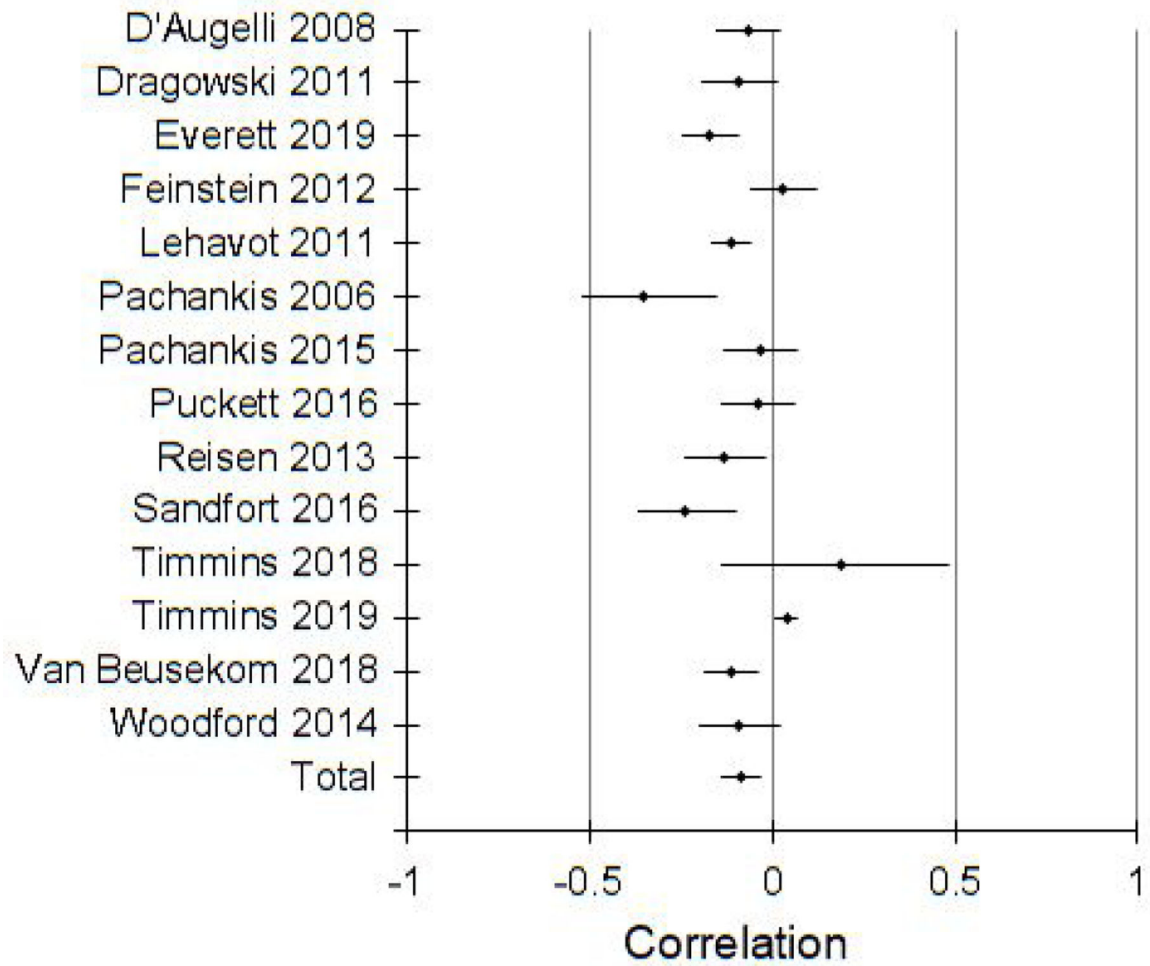


**Figure 1:** Correlation coefficients and 95% confidence intervals for studies that examined association between gender nonconformity and prejudice events.





**Figure 2:** Correlation coefficients and 95% confidence intervals for studies that examined association between gender nonconformity and concealment/disclosure.



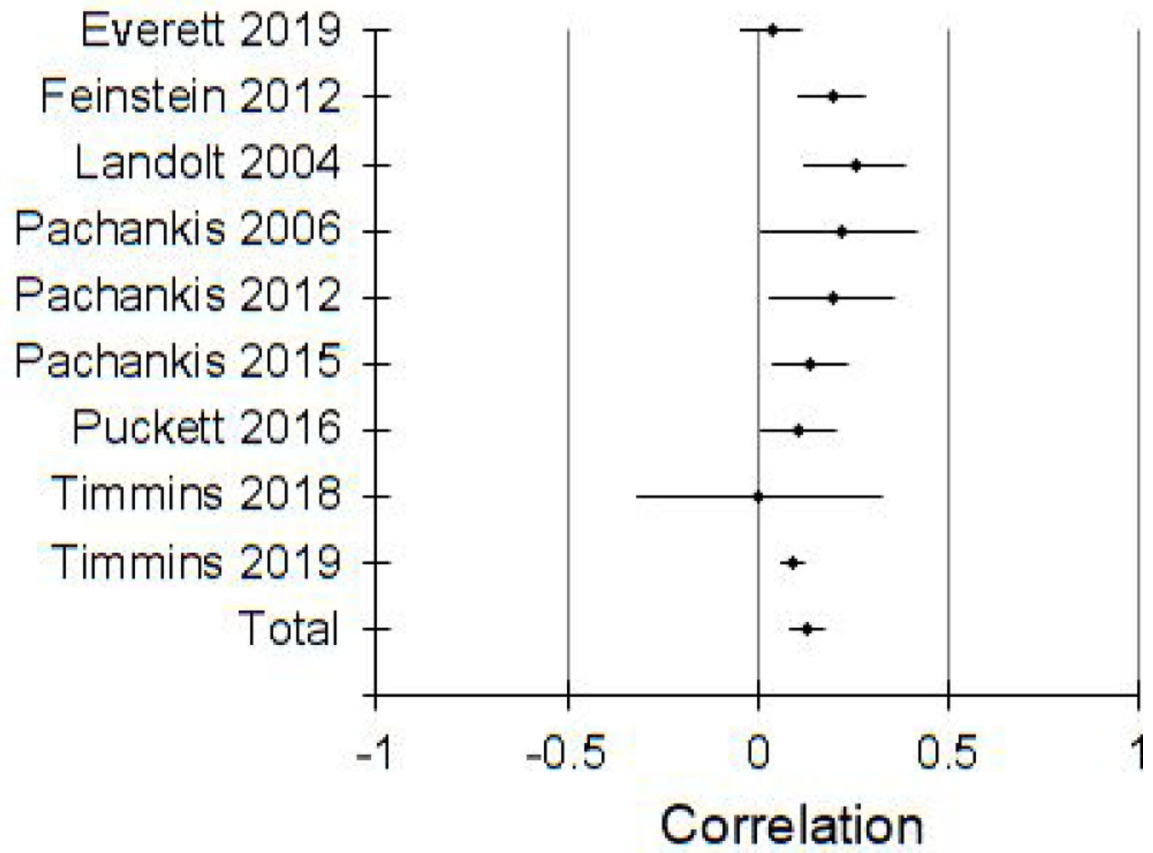
**Figure 3:** Correlation coefficients and 95% confidence intervals for studies that examined association between gender nonconformity and internalized homonegativity.

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**Figure 4:** Correlation coefficients and 95% confidence intervals for studies that examined association between gender nonconformity and expectations of rejection.

**Table 1:**

Descriptive statistics and study characteristics for studies that examined association between gender nonconformity and prejudice events.

	Study	Correlation Coefficient	Coefficient 95% Confidence Interval	Total Sample Size	Mean Age	Adolescent vs. Adult	Measure of Gender Nonconformity	Gender	Country
1	Baams (2013)	0.218	0.077, 0.349	192	19.2	Adult	Current	M, F	Netherlands
2	Bui (2010)	0.256	0.140, 0.364	268	17	Adolescent	Childhood	M	USA
3	Cannon (2007)	0.180	0.093, 0.265	488	35.32	Adult	Childhood	M	USA
4	Cook (2013)	0.186	0.083, 0.285	353	24.8	Adult	Current	M	South Africa
5	D'Augelli (2002)	0.160	0.051, 0.265	320	19.2	Adult	Childhood	C	USA/ Canada/ New Zealand
6	D'Augelli (2006)	0.143	0.059, 0.225	528	17.03	Adolescent	Childhood	C	USA
7	Everett (2019)	0.040	-0.039, 0.119	612	39.17	Adult	Current	F	USA
8	Feinstein (2012)	0.230	0.142, 0.314	467	31.24	Adult	Childhood	C	--
9	Friedman (2006)	0.354	0.165, 0.518	96	20.32	Adult	Childhood	M	USA
10	Kosciw (2014)	0.181	0.141, 0.220	6083	16	Adolescent	Current	C	USA
11	Kosciw (2016)	0.234	0.186, 0.282	5422	16.1	Adolescent	Current	C	USA
12	Landolt (2004)	0.370	0.241, 0.486	191	38.6	Adult	Childhood	M	Canada
13	Lehavot (2011)	0.098	0.045, 0.150	1381	33.54	Adult	Current	F	USA
14	Levitt (2002)	0.229	0.003, 0.432	71	--	--	Current	F	USA
15	McCutcheon (2018)	0.145	0.078, 0.211	835	18.78	Adult	Childhood	C	USA
16	Pachankis (2015)	0.257	0.160, 0.349	374	37	Adult	Childhood	M	USA
17	Pilkington (1995)	0.190	0.050, 0.322	194	18.9	Adult	Current	C	USA
18	Plöderl (2009)	0.295	0.135, 0.440	142	35.87	Adult	Childhood	M, F	Austria
19	Puckett (2016)	0.160	0.061, 0.256	383	39.3	Adult	Current	C	USA
20	Reisen (2013)	0.220	0.110, 0.325	301	41	Adult	Current	M	USA
21	Sandfort (2016)	0.276	0.141, 0.401	196	26.7	Adult	Current	M	South Africa
22	Timmins (2018)	0.043	-0.280, 0.358	38	29.2	Adult	Childhood	C	Multiple
23	Timmins (2019)	0.193	0.164, 0.222	4248	29.9	Adult	Childhood	C	Multiple
24	Van Beusekom (2018)	0.108	0.035, 0.180	724	31.42	Adult	Current	M, F	Netherlands
25	Woodford (2014)	0.120	0.007, 0.230	299	24	Adult	Current	C	USA
Average		0.185	0.158, 0.211	968.24	27.48				
Total				24206					

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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**Table 2:**

Descriptive statistics and study characteristics for studies that examined association between gender nonconformity and concealment/disclosure.

	Study	Correlation Coefficient	Coefficient 95% Confidence Interval	Total Sample Size	Mean Age	Adolescent vs. Adult	Measure of Gender Nonconformity	Gender	Country
1	Bui (2010)	0.210	0.093, 0.322	268	17	Adolescent	Childhood	M	USA
2	Cook (2013)	0.150	0.046, 0.250	353	24.8	Adult	Current	M	South Africa
3	D'Augelli (2005)	0.173	0.061, 0.280	293	16.83	Adolescent	Childhood	C	USA
4	Lehavot (2011)	0.230	0.179, 0.279	1381	33.54	Adult	Current	F	USA
5	Pachankis (2006)	0.180	-0.032, 0.376	87	20.4	Adult	Childhood	M	USA
6	Pachankis (2011/2012)	0.030	-0.139-0.197	136	20.7	Adult	Childhood	M	USA
7	Pilkington (1995)	0.040	-0.101, 0.180	194	18.9	Adult	Current	C	USA
8	Puckett (2016)	0.110	0.010, 0.208	383	39.3	Ault	Current	C	USA
9	Sandfort (2016)	0.390	0.264, 0.503	196	26.7	Adult	Current	M	South Africa
10	Snell (2018)	0.040	-0.096, 0.175	209	32	Adult	Current	M	USA
11	Timmins (2018)	0.100	-0.227, 0.407	38	29.2	Adult	Childhood	C	Multiple
12	Timmins (2019)	0.140	0.110, 0.169	4248	29.9	Adult	Childhood	C	Multiple
13	Van Lisdonk (2015)	0.080	-0.033, 0.191	305	16.75	Adolescent	Current	C	Netherlands
	Average	0.153	0.106, 0.199	622.38	25.08				
	Total			8091					

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.

**Table 3:**

Descriptive statistics and study characteristics for studies that examined association between gender nonconformity and internalized homonegativity.

	Study	Correlation Coefficient	Coefficient 95% Confidence Interval	Total Sample Size	Mean Age	Adolescent vs. Adult	Measure of Gender Nonconformity	Gender	Country
1	D'Augelli (2008)	-0.065	-0.150, 0.021	523	17.03	Adolescent	Both	C	USA
2	Dragowski (2011)	-0.090	-0.194, 0.016	345	19	Adult	Childhood	C	USA/Canada/ New Zealand
3	Everett (2019)	-0.170	-0.246, -0.092	612	39.17	Adult	Current	F	USA
4	Feinstein (2012)	0.030	-0.061, 0.120	467	31.24	Adult	Childhood	C	--
5	Lehavot (2011)	-0.110	-0.162, -0.058	1381	33.54	Adult	Current	F	USA
6	Pachankis (2006)	-0.350	-0.522, -0.150	87	20.4	Adult	Childhood	M	USA
7	Pachankis (2015)	-0.030	-0.131, 0.072	374	37	Adult	Childhood	M	USA
8	Puckett (2016)	-0.040	-0.140, 0.060	383	39.3	Adult	Current	C	USA
9	Reisen (2013)	-0.130	-0.240, -0.017	301	41	Adult	Current	M	USA
10	Sandfort (2016)	-0.237	-0.365, -0.100	196	26.7	Adult	Current	M	South Africa
11	Timmins (2018)	0.190	-0.138, 0.480	38	29.2	Adult	Childhood	C	Multiple
12	Timmins (2019)	0.040	0.010, 0.070	4248	29.9	Adult	Childhood	C	Multiple
13	Van Beusekom (2018)	-0.113	-0.184, -0.040	724	31.42	Adult	Current	M, F	Netherlands
14	Woodford (2014)	-0.090	-0.201, 0.024	299	24	Adult	Current	C	USA
	Average	-0.085	-0.139, -0.030	712.71	29.92				
	Total			9978					

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.

**Table 4:**

Descriptive statistics and study characteristics for studies that examined association between gender nonconformity and expectations of rejection.

	Study	Correlation Coefficient	Coefficient 95% Confidence Interval	Total Sample Size	Mean Age	Adolescent vs. Adult	Measure of Gender Nonconformity	Gender	Country
1	Everett (2019)	0.040	-0.039, 0.119	612	39.17	Adult	Current	F	USA
2	Feinstein (2012)	0.200	0.111, 0.286	467	31.24	Adult	Childhood	C	--
3	Landolt (2004)	0.260	0.123, 0.388	191	38.6	Adult	Childhood	M	Canada
4	Pachankis (2006)	0.224	0.014, 0.415	87	20.4	Adult	Childhood	M	USA
5	Pachankis (2012)	0.200	0.033, 0.356	136	20.7	Adult	Childhood	M	USA
6	Pachankis (2015)	0.140	0.039, 0.238	374	37	Adult	Childhood	M	USA
7	Puckett (2016)	0.110	0.010, 0.208	383	39.3	Adult	Current	C	USA
8	Timmins (2018)	0.005	-0.315, 0.324	38	29.2	Adult	Childhood	C	Multiple
9	Timmins (2019)	0.095	0.065, 0.125	4248	29.9	Adult	Childhood	C	Multiple
Average		0.132	0.085, 0.179	726.2	31.72				
Total				6536					

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.