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ORIGINAL ARTICLE

Predictors of Transgender Prejudice: A Meta-Analysis

Hailey A. Hatch[1] · Ruth H. Warner[1] · Kristin A. Broussard[2] · Helen C. Harton[3]

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Abstract
Transgender people often experience discrimination and prejudice; therefore, it is important to explore the underlying factors that contribute to prejudice. Past research has found that individual difference variables (e.g., gender, political conservatism) predict transgender prejudice. In the current research, we aimed to better understand the association between transgender prejudice and 15 individual difference predictors (i.e., gender, sexual orientation, single-item political orientation, social dominance orientation, right wing authoritarianism, religiosity, religious fundamentalism, gender essentialism, gender role beliefs, sexism, gender self-esteem, aggression, lesbian, gay, bisexual [LGB] attitudes, contact with LGB individuals, and contact with transgender individuals) by conducting a random-effects meta-analysis. After screening, 82 studies with a total of 36,285 participants met the criteria and were included in the analyses. Across all studies, all predictors except for gender self-esteem ($r = .09$; 95% CI [-.004, .18]) were significant in predicting transgender prejudice. Overall, there were small to large effect sizes, with LGB attitudes having the largest magnitude ($r = .71$; 95% CI [.65, .76]) and aggression having the smallest magnitude ($r = .15$; 95% CI [.08, .23]). These results provide further evidence that attitudes toward transgender people are significantly related to individual differences, gender beliefs, sexual orientation attitudes, and social ideologies.

Keywords Transgender prejudice · Meta-analysis · Gender beliefs · Individual differences

Transgender (often shortened to 'trans') individuals are people whose gender identity does not align with their sex assigned at birth. Trans people tend to have more negative experiences compared to their cisgender counterparts (i.e., people whose gender identity aligns with their sex assigned at birth) because of their gender identity (National Coalition of Anti-Violence Programs [NCAVP], 2013). Transgender people are more likely to experience police violence compared to cisgender people (NCAVP, 2013), experience higher rates of discrimination and higher risk for depression and suicide compared to cisgender individuals (Haas et al., 2014; Miller & Grollman, 2015). Further, despite only making up approximately 0.6% of the United States population (Flores et al., 2016), recent FBI data suggest that hate crimes resulting from an offender's gender identity biases constituted approximately 2.5% of all hate crime incidents in 2020 (Federal Bureau of Investigation, 2021). Greater experience of prejudice and rejection is associated with negative mental health outcomes among transgender individuals (Scandurra et al., 2017). For example, data from the 2016 National Transgender Discrimination Survey suggests that 41% of transgender individuals reported an attempted suicide in their lifetime compared to approximately 5% of the general population (Haas et al., 2014). These negative experiences and outcomes may be amplified with intersecting marginalized identities (e.g., transgender women of color; Gyamerah et al., 2021; NCAVP, 2013; Stotzer, 2008). Ultimately, these statistics suggest that anti-transgender prejudice and discrimination is a serious issue with detrimental consequences for transgender people's lives.

The study of prejudice toward transgender individuals has only recently become more prominent within the literature. However, several recent studies have linked a variety of demographic variables (e.g., gender, sexual orientation) and individual difference variables (e.g., right-wing authoritarianism [RWA] and political conservatism) to transgender prejudice. The current study attempts to clarify and organize this growing literature by conducting a meta-analytic

✉ Hailey A. Hatch
hailey.hatch@slu.edu

[1] Department of Psychology, Saint Louis University, 3700 Lindell Blvd, St. Louis, MO 63108, USA

[2] Villanova University, Villanova, PA, USA

[3] Department of Psychology, University of Northern Iowa, Cedar Falls, IA, USA

review of the predictors of transgender prejudice, including which predictors are most strongly related to transgender prejudice, or whether these variables consistently predict transgender prejudice. Specifically, we examined the associations between transgender prejudice and 15 key predictor variables (i.e., gender, sexual orientation, political conservatism, social dominance orientation [SDO], RWA, religiosity, religious fundamentalism, gender essentialism, gender role beliefs, sexism, gender self-esteem, aggression, lesbian, gay, bisexual [LGB] attitudes, contact with LGB individuals, and contact with transgender individuals) using a random-effects meta-analysis. The variables included in the current meta-analysis were selected through an extensive search of the literature. We divided the individual difference predictors into three broad categories that have been the focus of transgender prejudice research: demographic variables, individual difference variables, and LGB attitudes; however, it should be noted that these variables do not operate in isolation and work together to influence transgender prejudice.

Predictors of Transgender Prejudice

Demographic Variables

Two demographic variables that have often been examined in relation to prejudice toward transgender individuals are *rater gender* and *rater sexual orientation*. Most previous research suggests that among cisgender individuals, men report more prejudice toward transgender people compared to women (Gerhardstein & Anderson, 2010; Nagoshi et al., 2008). One explanation proposed for this association is that men's anxiety about the perceived loss of social status and power when gender social norms are threatened by transgender people produces more transgender prejudice (Warriner et al., 2013). Additionally, men may feel that transgender people threaten their masculinity and gender identity, which could also increase prejudice among men, especially when their gender identity as a man is important to them (Harrison & Michelson, 2019). Not all studies have observed this association however (e.g., Cunningham & Pickett, 2018; Elischberger et al., 2018), indicating inconsistencies in the literature regarding the strength of the association between transgender prejudice and rater gender.

Rater sexual orientation may also predict transgender prejudice, with heterosexual people being more likely to report greater transgender prejudice compared to cisgender lesbian, gay, and bisexual (LGB) individuals, partly due to the tendency for LGB people to endorse gender norms to a lesser extent than heterosexual people (Warriner et al., 2013). Unlike gender, previous research consistently finds a significant association between these variables; however, the strength of the association tends to differ. For instance, some studies demonstrate a weak association (e.g., Cunningham & Pickett, 2018; McCullough et al., 2019), whereas other studies demonstrate a stronger association between rater sexual orientation and transgender prejudice (e.g., Hatch & Harton, 2017; Konopka et al., 2019). Thus, the strength of this association remains unclear.

Individual Difference Variables

Previous research suggests that individual difference variables, including *political beliefs*, *religious beliefs*, *gender beliefs*, and *aggression* also relate to transgender prejudice. Political beliefs may relate to transgender prejudice in different ways. Broadly, political conservatism is characterized by an intolerance of ambiguity (Jost et al., 2003), which could arise if someone believes that a transgender person is not clearly presenting as a man or a woman. Indeed, a great deal of research suggests that stronger political conservatism relates to more transgender prejudice, whereas stronger political liberalism relates to less transgender prejudice (Locantore & Wasarhaley, 2019; Stern & Rule, 2017). One way that research has examined political beliefs is via single-item measures that ask individuals how liberal or conservative they are on a Likert-type scale. Although this measurement of political beliefs tends to consistently predict transgender prejudice, some studies suggest that there is not a significant association between political beliefs and transgender prejudice, at least among certain samples. For instance, Norton and Herek (2013) found that a single-item measure of political orientation was not significantly related to transgender prejudice for men, although it was for women (i.e., higher conservatism relating to higher prejudice). Additionally, another study found that these two variables were related for individuals in the United States (US), but not India, suggesting that participant country may also influence the degree to which political beliefs relate to transgender prejudice (Elischberger et al., 2018).

Political beliefs can also be measured via SDO and RWA, which are both related to right-wing ideologies (e.g., higher SDO and RWA relate to stronger political conservatism; Jost et al., 2003). SDO is an orientation that suggests a preference for one's own group over outgroups as well as a preference for social hierarchies (Pratto et al., 1994). SDO is also related to prejudice toward marginalized groups, such that those higher in SDO tend to report more racism (Van Hiel & Mervielde, 2006), homophobia (Çetiner & Van Assche, 2021), and transphobia (Makwana et al., 2018). Additionally, RWA is characterized by the tendency to submit to authority figures, to adhere to conventional social norms, and to aggress against those who may be considered threatening or perceived to go against conventional norms (Altemeyer, 1981; Peterson & Zubriggen, 2010). RWA also relates to many types of prejudice, with those higher in RWA typically

reporting more transgender prejudice (Nagoshi et al., 2008; Norton & Herek, 2013), which could result from the belief that transgender individuals may be viewed as not following conventional social norms. For both SDO and RWA, previous research suggests that there does tend to be an association between the endorsement of these ideologies and trans prejudice; however, the strength of the associations tend to vary from small to large (e.g., Hoffarth & Hodson, 2018; McCullough et al., 2019; Perez-Arche & Miller, 2021).

Religious beliefs also tend to relate to transgender prejudice. Two ways that religious beliefs are frequently examined is through single-item measures (e.g., "how religious are you?") as well as scales assessing religious fundamentalism (e.g., Religious Fundamentalism Scale; Altemeyer & Hunsberger, 2004), which is the belief that there is one set of religious teachings that are considered the truth (Altemeyer & Hunsberger, 1992). Single-item religiosity tends to relate to transgender prejudice, with higher levels of religiosity relating to more negative attitudes (e.g., Willoughby et al., 2010); however, the strength of the association varies from weak (e.g., Burke, 2015) to moderate (e.g., McDermott et al., 2018). The association between single-item religiosity and transgender prejudice may vary in strength given that single-item religiosity does not capture the differences between religious orientations. For instance, Jewish people report more positive attitudes toward transgender people compared to other religious affiliations (e.g., Protestants, Catholics; Cragun & Sumerau, 2015). Ultimately, this suggests that there may be other factors within religious beliefs that need to be explored.

Given that religious fundamentalism is not tied to one specific set of religious beliefs and can capture attitudes and beliefs about one's own religion (Altemeyer & Hunsberger, 1992), it may be a better predictor of transgender prejudice. Religious fundamentalism is also positively related to RWA and prejudice (e.g., homophobia; Pal & Sinha, 2016), which suggests that there is likely a strong association between religious beliefs and transgender prejudice. In general, religious beliefs may increase prejudice toward groups that violate religious values (Jackson & Hunsberger, 1999); therefore, if transgender people are viewed as violating religious or moral values among religious individuals, then they may be more likely to display transgender prejudice than those lower in religiosity and religious fundamentalism. Although a great deal of research suggests that religious beliefs relate to transgender prejudice, there are also additional findings that suggest the association between the two variables is weak (e.g., Burke, 2015; Garelick et al., 2017); therefore, exploration of this association needs to be further examined across studies.

Gender beliefs constitute another set of variables that has been explored as a predictor of transgender prejudice. More specifically, gender essentialism, which is the belief that gender is binary, innate (i.e., based on biology), and cannot change (Gelman, 2004; Gülgöz et al., 2019), is one potential gender belief that may influence transgender prejudice. For instance, those who are higher in gender essentialism also tend to report more transgender prejudice (i.e., against trans rights; Wilton et al., 2018), likely because transgender individuals may violate the belief that gender cannot be changed. Another gender belief that may influence trans prejudice is gender role beliefs. Endorsement of traditional gender role beliefs (e.g., women should engage in more feminine roles; Kerr & Holden, 1996) is associated with more transgender prejudice (e.g., Hill & Willoughby, 2005), likely due to a perception of transgender individuals deviating from traditional gender roles. Although most research suggests a strong association between traditional gender role beliefs and transgender prejudice (e.g., Perez-Arche & Miller, 2021; Watjen & Mitchell, 2013), there are other studies that suggest contradictory findings (i.e., little to no association; Elischberger et al., 2016).

In addition, sexism (e.g., attitudes toward women, benevolent sexism, hostile sexism) is another gender belief that may influence trans prejudice. Broadly, negative attitudes toward women are related to hypermasculinity, with men higher in hypermasculinity displaying more aggression toward women compared to men lower in hypermasculinity, especially when women violate gender role norms (Reidy et al., 2009) as well as higher levels of sexism, which also relates to transgender prejudice (e.g., Nagoshi et al., 2008). In general, those who report higher levels of sexism (i.e., more negative attitudes toward women and higher levels of benevolent and hostile sexism) also report higher levels of transgender prejudice; however, the strength of the association varies from weak (e.g., Warriner et al., 2013) to strong (e.g., Claman, 2007; Tebbe et al., 2014).

Lastly, gender self-esteem, which can be defined as the degree of importance one places on their gender identity (Falomir-Pichastor & Mugny, 2009; Glotfelter & Anderson, 2017), may also predict transgender prejudice. Gender self-esteem seems to be particularly important in predicting transgender prejudice for men compared to women, due to the connection between masculinity and gender self-esteem (e.g., Falomir-Pichastor & Mugny, 2009), which may explain, in part, the previous findings that men tend to hold more negative attitudes toward transgender individuals compared to women. There are contradictory findings regarding this association, though, with some studies finding no association between gender self-esteem and transgender prejudice for men (e.g., Chen & Anderson, 2017).

Aggression can take a variety of forms (e.g., physical, verbal) and can vary based on whether it is examined as a trait versus state level variable. Broadly, people with higher levels of aggression or who display higher levels of proneness to

aggressive behavior may also report higher levels of hypermasculinity. One study found that hypermasculine men were more likely to report higher levels of aggression compared to men low in hypermasculinity (Parrott & Zeichner, 2003). Further, since masculinity in general relates to transgender prejudice, it is probable that hypermasculinity and aggression also relate to transgender prejudice, with higher levels of aggression relating to more transgender prejudice. Previous research does support this association (e.g., Tebbe et al., 2014); however, there are contradictory findings regarding the strength of the association. Ultimately, aggression/proneness to aggressive behavior alongside the other predictor variables need to be explored on a meta-analytic level to determine if the links among these variables and transgender prejudice are consistent.

LGB Attitudes and Contact

A final category of variables that relates to transgender prejudice is attitudes toward LGB individuals, which can be further broken down into *self-reported LGB attitudes* and *contact with LGB individuals* as well as *contact with transgender individuals*. As mentioned, attitudes toward LGB and transgender individuals (e.g., homophobia; transphobia) tend to relate to one another (Nagoshi et al., 2008). This association may be the result of individuals viewing LGBTQ + individuals as one group and conflating gender identity and sexual orientation, even though they are distinct constructs. It may also occur because transgender individuals as well as LGB individuals may be viewed as violating perceived social norms, which may result in negative attitudes. Ultimately, research suggests a strong association between these two variables (e.g., Claman, 2007; Glotfelter & Anderson, 2017).

Contact with LGBT group members can influence attitudes toward those groups. Intergroup contact theory suggests that personal contact with members of a different group can reduce prejudice toward that group (Pettigrew & Tropp, 2006). Therefore, contact with LGB and transgender individuals as well as the notion that transgender individuals are typically viewed similarly to LGB individuals (e.g., homophobia and transphobia are related; Nagoshi et al., 2008) suggests that contact likely influence attitudes toward trans people. Indeed, previous research examining these associations suggests that increased LGB and trans contact relates to less prejudice toward trans individuals (e.g., McCullough et al., 2019); however, this is not always the case, with some studies finding little (e.g., Hoffarth & Hodson, 2018) to no association (e.g., Elischberger et al., 2018) among these variables. It is likely that the quality of the contact matters to a greater extent than the frequency of the contact. For instance, previous research suggests that contact quality predicts ethnic prejudice, whereas contact quantity does not (Servidio et al., 2021). However, the type of prejudice (i.e., implicit vs. explicit) may also contribute to the importance of quality vs. quantity of contact, with contact quality relating to more positive explicit outgroup attitudes and contact quantity relating to more positive implicit outgroup attitudes (Prestwich et al., 2008). In either case, contact with LGBTQ + individuals should be examined across studies to further explore the association with transgender prejudice.

Measuring Transgender Prejudice

Prejudice toward transgender people has been measured in a variety of ways and several scales exist that capture different aspects of transgender prejudice. One example of a widely used scale is the Genderism and Transphobia Scale (GTS), which includes three subscales measuring genderism (ideology that supports gender conformity), transphobia (disgust towards gender non-conformity), and gender bashing (negative treatment of gender non-conforming people; Hill & Willoughby, 2005). Other frequently cited scales include the Transgender Attitudes and Beliefs Scale (TABS; Kanamori et al., 2017), the Attitudes toward Transgender Individuals Scale (ATTI; Walch et al., 2012), and the Transphobia Scale (TS; Nagoshi et al., 2008). Additionally, researchers also examine transgender prejudice via single item measures, such as using a feeling thermometer to assess warmth toward transgender people as a group. Transgender prejudice has also been examined via asking about support for trans rights and policies that impact trans people (e.g., bathroom bill; Parent & Silva, 2018; see Morrison et al., 2017 for a review of the psychometric properties of 83 different transgender attitude measures). There have been criticisms of these different measures because some measures may conflate transgender identities with gender expression (e.g., GTS); therefore, these measures may not be solely capturing attitudes toward transgender individuals (Billard, 2018).

Further, transgender prejudice is examined both together (i.e., focusing on trans people as a whole) and separately (i.e., examining attitudes toward trans men and trans women separately). To address some of the validity concerns of transgender measurement, Billard (2018) created a measure that examines trans men and women separately (i.e., Attitudes toward Transgender Men and Women Scale [ATTMW]). Further, some studies have modified existing transgender prejudice measures to examine prejudice toward trans men and women separately (e.g., Perez-Arche & Miller, 2021; Welch et al., 2016). In studies that examine prejudice toward transgender men and women separately, there tends to be similar predictors for both groups (e.g., SDO, RWA; Perez-Arche & Miller, 2021). Further when compared to one another, prejudice toward transgender men and women also tend to be similar (Welch et al., 2016). However, the majority of research tends to focus on prejudice toward trans

people as a whole rather than separating out identities, which is what we have focused on as well in this meta-analysis.

Potential Moderators

Beyond the direct associations between the aforementioned variables and transgender prejudice, there may be other variables that impact those associations. More specifically, it is possible that the year that the data were collected/published, the publication status (i.e., published versus non-published), the study type (e.g., experimental versus non-experimental), the country the data were collected from, and the sample type (e.g., online adults; students) may influence the association between the proposed predictor variables and transgender prejudice. There is research to support that transgender prejudice has decreased over time (e.g., Cunningham & Pickett, 2018), suggesting that data/publication year might moderate some effects. The moderating effect of publication status was used as one way to examine potential publication bias among studies. The type of study may also influence the effects of transgender prejudice, with experimental studies potentially producing larger effects compared to correlational studies, since there is an emphasis on finding significant differences in experimental research (Sibley & Duckitt, 2008). Further, cultural differences in various countries may influence policies and laws related to the rights of transgender people, which predicts transgender prejudice (Earle et al., 2021). Lastly, the sample type may influence transgender prejudice, with student samples reporting more positive attitudes compared to non-student samples, as education can influence support for trans rights (Flores et al., 2016) and relate to less transgender prejudice (Norton & Herek, 2013). Others argue that student samples may also differ from non-student samples, with the differences not only being in the statistical significance, but also the directionality of the effects (e.g., Henry, 2008; Peterson, 2001). This could potentially be due to developmental differences, with college students holding less crystalized attitudes compared to older adults (Sears, 1986).

Current Study

Research on predictors of transgender prejudice is a burgeoning research area. Although previous research suggests that the aforementioned factors (demographics, individual differences such as gender beliefs and political attitudes, and LGB attitudes) predict transgender prejudice, there are some inconsistencies. To our knowledge, there have been no meta-analyses examining how strong the associations are between the predictors and transgender prejudice and thus, it is important to provide a statistical summarize of the research.

Therefore, we examined the associations between the following predictors and transgender prejudice: rater gender, rater sexual orientation, political conservatism, SDO, RWA, religiosity, religious fundamentalism, gender essentialism, gender role beliefs, sexism, gender self-esteem, aggression, LGB attitudes, LGB contact, and transgender contact. Additionally, we examined year, publication status, study type, country (the specific country that the data were collected, if available; however, if the information was not available, the country of author institution was used), and sample type as potential moderators of those associations. Based on previous research, we hypothesized the following:

H1: Transgender prejudice will be associated with both gender and sexual orientation, such that men and heterosexuals will report higher transgender prejudice than women and LGB individuals.
H2: Higher political conservatism, RWA, and SDO will relate to more transgender prejudice.
H3: Higher religiosity and religious fundamentalism will relate to more transgender prejudice.
H4: Higher gender essentialism, belief in traditional gender roles, sexist attitudes, and gender self-esteem (for men) will relate to more transgender prejudice.
H5: Higher aggression will relate to more transgender prejudice.
H6: Higher LGB prejudice will relate to more transgender prejudice.
H7: Less contact with LGB and transgender individuals will relate to more transgender prejudice.

Additionally, we examined five potential moderators, which were exploratory. Our combined research question for the proposed moderators was the following:

Research Question: Does year, publication status, study type, country, and sample type moderate the hypothesized associations above?

Method

Literature Search

In 2019, we searched for studies using the databases PsycInfo and Google Scholar using the keywords *trans*, transgender prejudice, transgender prejudice, anti-transgender, transsexual,* and *transphobia*. In addition, we posted a request for unpublished data examining transgender prejudice on the Society for Personality and Social Psychology's (SPSP) listserv in 2020. We also examined the reference

lists of included articles to identify any relevant studies not found in the database searches. To do so, we examined the reference lists for relevant titles and compared for duplicate articles from the database searches. If the reference was not a duplicate, we further screened it on the basis of the abstract. Further, we examined 2019 conference programs from SPSP as well as the Association for Psychological Science and the American Psychological Association. We also examined the 2020 SPSP conference program. For the conference programs, we emailed researchers whose studies appeared to match our inclusion criteria based on the program's study description (8 contacted, 3 responded, 37.5% response rate). We did not restrict our search based on publication year or the sample used in the study.

To include more interdisciplinary research as suggested by reviewers, we also conducted a second search using the database Sociological Abstracts using the keywords "*transgender* AND *prejudice*." The year range was restricted to studies during and before 2020 to be consistent with the first search. In addition, we searched the American Sociological Association's website using the keyword *transgender*, which includes presentations from ASA's conferences dating back to 2003. Given that we did not collect original data, Institutional Review Board (IRB) approval was not needed from our institution.

Screening

In order to be included in the meta-analysis, studies had to include a measure of transgender prejudice. Examples of transgender prejudice include the GTS (e.g., "It is morally wrong for a woman to present herself as a man in public," Hill & Willoughby, 2005), TABS (e.g., "If I knew someone was transgender, I would tend to avoid that person," Kanamori et al., 2017), and single item measures of negative emotions felt towards transgender people as well as feeling thermometers. After reviewing multiple predictors and assessing suggestions for the number of studies needed for power in random-effects meta-analyses (Jackson & Turner, 2017), we narrowed down our predictors to 15 variables. Studies had to include at least one demographic variable or individual difference measure from our list – demographic variables (i.e., rater gender, rater sexual orientation), political conservatism (e.g., single-item political orientation, SDO, RWA), religiosity (e.g., single-item religiosity, religious fundamentalism), gender beliefs (e.g., gender essentialism, gender role beliefs, sexism, gender self-esteem), aggression, LGB attitudes, LGB contact, and trans contact.

We restricted our search to papers written in English and unpublished data written in English or Spanish ($N = 1$) due to the language expertise of the coders. Studies also had to include information to calculate an effect size based on a correlation between an individual difference and a transgender attitude measure. For studies that did not explicitly include all information, we emailed the authors to request the information. During the initial search, we emailed a total of 25 authors and received 9 responses (36% response rate); with 6 being able to provide us the information needed. For the second search, we emailed five authors to request information. One author's email address was no longer active, two did not respond, one responded and was not able to share the information due to IRB requirements, and one gave the clarification needed for coding (40% response rate). After screening of the initial search, we included 75 studies consisting of 57 published studies, 5 dissertations, one conference poster, 2 data sets from published papers, and 7 unpublished data sets. Additionally, the second search yielded a total of 7 studies consisting of 5 published studies and 2 dissertations. Collectively, there are 82 studies across both searches (see Fig. 1 for an overview of the selection process based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses [PRISMA]; Page et al., 2021).

Coding Procedure

The first author independently coded all 82 studies included in the meta-analysis. Additionally, from the initial search, two trained undergraduate research assistants each coded 50% of the correlations from the published papers and the second author coded 100% of the correlations from the raw data sets. The intraclass correlations (two-way mixed; absolute agreement) between the first author and undergraduate research assistants on coding of the published papers were .97 and .99. The intraclass correlation (two-way mixed; absolute agreement) between the first and second authors regarding the raw data sets was .99. For the second search, both the first author and one of the previously trained undergraduate research assistants independently coded all 7 studies and had high inter-rater reliability (intraclass correlation = .98).

Based on a coding sheet, we coded study characteristics (i.e., author, publication year, country the sample was collected in, type of sample, publication status), type of transgender attitude measure used, study measures, and effect sizes. The moderators to be tested included data/publication year (data year was used when available, otherwise publication year was used), published status (1 = published, 2 = not published), study type (1 = correlational, 2 = experimental), country (1 = US, 2 = not US), and sample type (1 = college students, 2 = non-college students). Additionally, when data year was given in a range (e.g., 2008–2009), the later year was used. The study measures included gender (0 = women, 1 = men), sexual orientation (0 = heterosexual, 1 = LGB), single-item political orientation, SDO, right-wing authoritarianism [RWA], religiosity, religious fundamentalism, gender essentialism, gender role beliefs, sexism, gender

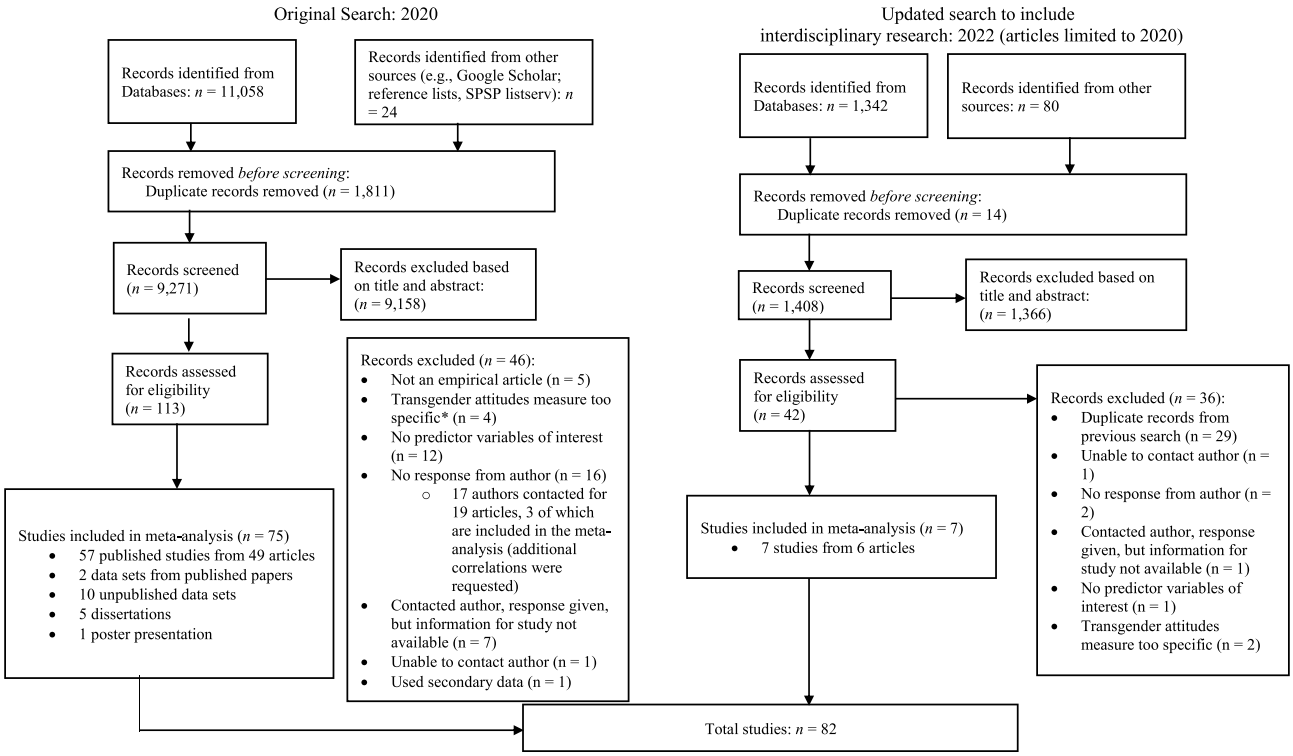

Fig. 1 PRISMA Flow Chart for the Meta-Analysis Selection Process. *Note.* *Some measures focused on implicit trans attitudes and not explicit; others were too specific for our purposes (e.g., hiring recommendations)

self-esteem, aggression, LGB attitudes, contact with LGB individuals, and contact with transgender individuals.

If a study included multiple measures of transgender prejudice (e.g., a feeling thermometer and the TABS), we transformed the correlations into Fisher's *z* scores and averaged them. If a study measured attitudes toward transgender women and transgender men separately, we also transformed them into Fisher's *z* scores and averaged them. We did these transformations so that we did not include non-independent effects when summarizing across studies. There may be some reasons to examine trans men and women prejudice separately (Worthen, 2013); however, given that most research has not explored transgender prejudice in this way, the current analysis focused solely on general transgender prejudice.

Analysis

The effect size statistic used was Pearson's product-moment correlation coefficient (*r*). We analyzed the data via R 4.1.0, using the METAFOR package (Viechtbauer, 2010). Effect sizes were calculated using a random effects model because the effect is likely to vary (Borenstein et al., 2009). Correlations were calculated such that higher numbers indicated a positive association between the predictor variable and transgender prejudice. We also conducted homogeneity tests for each effect as well (Hedges & Olkin, 1985). A significant *Q* statistic would mean that there was greater variation in effect sizes than expected by chance and that the variation might be accounted for by moderators (e.g., publication year or sample type).

Results

Descriptive Statistics

Publication year ranged from 2004 to 2021. The studies reported 308 separate correlations. Details about these studies including data/publication year, country, sample type, and measures used are included in Table S1 of the online supplement. All articles included in the meta-analysis appear in the reference list and are denoted with an *. Sample size ranged from 30 to 8,115 with a total of 36,285 participants ($M_{age} = 27.32$, $SD = 9.04$). Of those that reported their gender ($N = 35{,}458$), 42.6% ($n = 15{,}094$) of the sample identified as men, whereas 56.6% ($n = 20{,}086$) identified as women; however, not all studies included information regarding whether all participants identified as cisgender. Further, .004% ($n = 130$) of people identified as a gender that was not "man" or "woman." For more demographic information, see Table 1.

Table 1 Demographic Variables of Studies

Demographic Variable	%	*n*
Gender (*N* = 35,458)		
Men	42.6	15,094
Women	56.6	20,086
Other/Not listed	0.004	130
Sexual orientation (*N* = 28,596)		
Heterosexual	88.2	25,213
LGBTQ +	10.4	2,980
Race/Ethnicity (*N* = 22,642)		
Asian	9.8	2,226
Black or African American	9.6	2,163
Latina/o/x	6.3	1,436
White or European American	67.4	15,258
Other/Not listed	7.0	1,588
Religion (*N* = 10,263)		
Atheist/Agnostic	12.4	1,275
Catholic	15.5	1,593
Christian	40.3	4,140
Jewish	0.9	95
Muslim	0.6	59
Other/Not listed	24.2	2,484
Political Orientation (*N* = 6,660)		
Conservative	29.0	1,931
Liberal	32.0	2,134
Other/Not listed	36.7	2,446
Education (*N* = 19,713)		
Less than HS	7.6	1,505
HS	13.5	2,669
Some College	27.4	5,403
Bachelor's or Higher	21.3	4,209
Year in School (*N* = 2,532)		
First-year	48.1	1,217
Sophomore	20.8	470
Junior	15.8	357
Senior	16.9	382

Valid percentages are displayed. Some studies did not report for all categories (e.g., a study may have reported the number of men, but not women or "other"). LBGTQ + = Lesbian, gay, bisexual, transgender +

Publication Bias

Publication bias may lead to an overestimation of effect sizes within published studies, since published studies tend to have larger effect sizes compared to unpublished studies (Rosenthal, 1979), which can result from insignificant findings being less likely to be published. We conducted Egger's test (Egger et al., 1997) to examine the funnel plot symmetry of each of the models (Sterne & Egger, 2005). There were no significant Egger's tests for any of our models (Table 2), suggesting that the funnel plots do not deviate from symmetry, and therefore publication bias is likely not present within our models. Additionally, to further test for publication bias, we conducted Duval and Tweedie's (2000) trim and fill procedure. Duval and Tweedie's (2000) trim and fill procedure examines publication bias by taking into account funnel plot asymmetry and will input new effect sizes into the funnel plot until it is symmetric; therefore, the results from this analysis determines the number of studies needed to reach an unbiased effect size. For our study, we found that many of the effect sizes remained the same, with all significant associations remaining significant (Table 2). The trim and fill results suggest that we can have confidence that our findings are not influenced by publication bias. However, the effect size for gender self-esteem, which was not significant reached significance when the trim and fill method was used, suggesting that published studies may be underestimating the effect of gender self-esteem on transgender prejudice.

Demographic Variables

We hypothesized that both gender and sexual orientation would be related to transgender prejudice, with men and heterosexuals holding more prejudice toward transgender individuals compared to women and LGB individuals, respectively. Our hypothesis was supported, with men ($r = .18$, $p < .001$, 95% CI [.14, .22]) and heterosexuals ($r = .23$, $p < .001$, 95% CI [.19, .26]) being more likely to report transgender prejudice compared to women and LGB individuals. Although both associations were significant and small, the effect size for the correlation with sexual orientation had a larger magnitude compared to gender. The test for homogeneity was significant for gender, $Q = 146.56$, $p < .001$ and sexual orientation, $Q = 36.36$, $p = .01$, indicating significant heterogeneity for both effects. Table 2 includes a summary of all effect sizes.

Individual Difference Variables

Political Beliefs

Further, in line with our predictions, higher political conservatism (PO; $r = .48$, $p < .001$, 95% CI [.43, .53]), SDO ($r = .46$, $p < .001$, 95% CI [.39, .52]), and RWA ($r = .58$, $p < .001$, 95% CI [.52, .65]), related to more transgender prejudice. Although all of the effects were medium to large, the effect for RWA had the largest magnitude among the political belief variables. The tests for homogeneity were significant for political conservatism, $Q = 441.11$, $p < .001$, SDO, $Q = 166.54$, $p < .001$, and RWA, $Q = 262.85$, $p < .001$, indicating significant heterogeneity for all three effects.

Table 2 Summary of Findings

Variable	*k*	*N*	*r*	95% CI	Trim and fill (number of studies filled)	95% CI	Egger et al.'s regression	*Q*	I^2
Gender	30	16,806	.18	[.14, .22]	.18 (0)	[.14, .22]	.01, *ns*	146.56***	81.7%
Sexual orientation	20	13,293	.23	[.19, .26]	.23 (0)	[.19, .26]	.11, *ns*	36.36**	59.2%
Political conservatism	28	10,748	.48	[.43, .53]	.44 (5)	[.39, .50]	1.37, *ns*	441.11***	92.4%
SDO	19	4675	.46	[.39, .52]	.46 (0)	[.39, .52]	–.12, *ns*	166.54***	87.4%
RWA	26	5129	.58	[.52, .65]	.63 (4)	[.56, .67]	–.46, *ns*	262.85***	91.2%
Religiosity	13	5259	.28	[.24, .32]	.27 (1)	[.23, .31]	.33, *ns*	20.45	41.4%
RF	19	4295	.43	[.36, .50]	.43 (0)	[.36, .50]	–.15, *ns*	110.98***	85.6%
Gender essentialism	18	3542	.46	[.36, .55]	.38 (5)	[.28, .48]	.17, *ns*	231.16***	94.2%
Gender role beliefs	17	4242	.60	[.50, .69]	.60 (0)	[.50, .69]	.36, *ns*	322.19***	95.6%
Sexism	19	4686	.47	[.36, .57]	.47 (0)	[.36, .57]	–.76, *ns*	306.39***	94.7%
Gender SE	8	1589	.09	[–.004, .18]	.14 (3)	[.05, .22]	–.59, *ns*	17.09*	60.5%
Aggression	12	2239	.15	[.08, .23]	.20 (4)	[.13, .27]	–1.91, *ns*	26.94**	60.2%
LGB attitudes	42	13,719	.71	[.65, .76]	.68 (4)	[.62, .74]	1.66, *ns*	1980.46***	97.3%
LGB contact	11	2429	–.33	[–.40, –.26]	–.33 (0)	[–.40, –.26]	.11, *ns*	35.36***	71.7%
Trans contact	26	6112	–.31	[–.40, –.22]	–.31 (0)	[–.40, –.22]	–.25, *ns*	411.82***	93.6%

Gender (0 = women, 1 = men). Sexual orientation (0 = heterosexual, 1 = LGB). Higher scores indicate more transgender prejudice. SDO = social dominance orientation. RWA = right wing authoritarianism. RF = religious fundamentalism. Gender SE = gender self-esteem. LGB = lesbian, gay, bisexual. *k* = total number of studies. *N* = total number of participants across studies. *r* = average correlation coefficient. *ns* = non-significant
*$p < .05$, **$p < .01$, ***$p < .001$

Religious Beliefs

Higher reports of religiosity ($r = .28$, $p < .001$, 95% CI [.24, .32]) and religious fundamentalism ($r = .43$, $p < .001$, 95% CI [.36, .50]) were also related to more transgender prejudice, which supported our hypotheses. Religiosity had a small effect, whereas religious fundamentalism had a medium effect. Further, religious fundamentalism had a stronger association with transgender prejudice compared to religiosity. The test for homogeneity was not significant for religiosity, $Q = 20.45$, $p = .06$, indicating non-significant heterogeneity; however, it was significant for religious fundamentalism, $Q = 110.98$, $p < .001$, indicating significant heterogeneity.

Gender Beliefs

We also proposed that higher endorsement of gender essentialism, belief in traditional gender roles, sexist attitudes, and gender self-esteem would relate to more transgender prejudice. Most of our hypotheses were supported for gender beliefs, with higher endorsement of gender essentialism ($r = .46$, $p < .001$, 95% CI [.36, .55]), belief in traditional gender roles ($r = .60$, $p < .001$, 95% CI [.50, .69]), and sexist attitudes ($r = .47$, $p < .001$, 95% CI [.36, .57]) relating to more transgender prejudice. However, contrary to our hypothesis, gender self-esteem was not significantly related to transgender prejudice ($r = .09$, $p = .06$, 95% CI [-.004, .18]). Further, participant gender composition of the studies was also examined to test whether the effect of gender self-esteem strengthened as the percentage of men increased; however, this test was also not significant, $\beta = -.001$, $p = .71$, 95% CI [-.004, .003]. Across the significant effects, the effects ranged from medium to large, with belief in traditional roles having the largest effect and gender essentialism having the smallest effect. The test for homogeneity was significant for gender essentialism, $Q = 231.16$, $p < .001$, belief in traditional gender roles, $Q = 322.19$, $p < .001$, sexist attitudes, $Q = 326.67$, $p < .001$, and gender self-esteem $Q = 17.09$, $p = .017$, indicating significant heterogeneity for all four effects.

Aggression

The hypothesis that higher levels of aggression would relate to more transgender prejudice was also supported ($r = .15$, $p < .001$, 95% CI [.08, .23]); however, the effect was small. The test for homogeneity was significant for aggression, $Q = 33.06$, $p = .002$, indicating significant heterogeneity.

LGB Attitudes

LGB attitudes, LGB contact, and transgender contact were all significantly related to transgender prejudice. Supporting our hypotheses, more negative attitudes toward LGB individuals ($r = .71$ $p < .001$, 95% CI [.65, .76]), less LGB contact ($r = -.33$, $p < .001$, 95% CI [-.40, -.26]), and less contact with transgender individuals ($r = -.31$, $p < .001$, 95% CI [-.40, -.22]) were all related to more transgender prejudice.

Across all LGB attitude variables, the effects were significant, with the effect sizes ranging from medium (i.e., LGB and trans contact) to large (i.e., LGB attitudes). The test for homogeneity was significant for LGB attitudes, $Q = 1980.46$, $p < .001$, LGB contact, $Q = 35.36$, $p < .001$, and transgender contact, $Q = 411.82$, $p < .001$, indicating significant heterogeneity for all three effects.

Moderation Analyses

Tests for homogeneity indicated significant variation in the effects for each of the predictors of transgender prejudice. Thus, in addition to our main analyses, we also examined whether data/publication year (i.e., data year when available and publication year when not available), publication status (1 = published, 2 = not published), type of study (1 = correlation, 2 = experiment), country (1 = US, 2 = non-US), and the type of sample (1 = college student, 2 = non-college student) moderated the effects observed above. In addition to examining country as a binary moderator (i.e., US vs. non-US), we also examined country support, with higher numbers indicating more support for LGBTQ + rights in that country (1 = China, India, Philippines; 2 = Poland, Thailand; 3 = Italy; 5 = Greece; 6 = US; 8 = Australia; 9 = Canada, Belgium, Britain, UK, Portugal, Spain; 10 = Brazil). The coding for LGBTQ + rights support was based on Mendos et al. (2020) and could range from 0 to 11. See Table 3 for a summary of the moderation analyses. The moderators were not significant for any of the associations between gender, sexual orientation, SDO, gender essentialism, gender self-esteem, or aggression and transgender prejudice.

Data/Publication Year

Year moderated the association between political conservatism and transgender prejudice. This finding suggests that over time, the association between political conservatism and transgender prejudice, $\beta = .03$, $p < .001$, 95% CI [.02, .04], has become more positive. Additionally, year moderated the association between LGB contact and transgender prejudice, with the association becoming more negative over time, $\beta = -.07$, $p = .003$, 95% CI [-.12, -.03].

Publication Status

Publication status was a significant moderator for the association between transgender prejudice and religious fundamentalism, $\beta = .23$, $p < .01$, 95% CI [.06, .40], and LGB attitudes, $\beta = .33$, $p = .02$, 95% CI [.04, .61] (Table 3). For religious fundamentalism, although both effects were significant, the effect for non-published studies ($r = .57$, $p < .001$, 95% CI [.47, .65]) was stronger than published studies ($r = .39$, $p < .001$, 95% CI [.31, .46]). Further, both effects were large and significant for LGB attitudes. Similarly, the effect for non-published studies ($r = .82$, $p < .001$, 95%

Table 3 Betas from the Moderation Analyses for the Study Variables and Transgender Prejudice

Variable	Year	Publication status	Study type	Country	Sample type
Gender	–.005	.05	–.003	.02	–.08
Sexual orientation	.004	.003	.06	.05	–.05
Political conservatism	.03***	.12	.11	–.27	–.08
SDO	–.01	.08	.10	–.08	.11
RWA	.02	.13	.13	.05	.34***
Religiosity	.01	–.06	–.09*	.07	–.07
RF	.003	.23**	.15	.05	.19
Gender essentialism	.01	.003	–.18	–.09	–.13
Gender role beliefs	.003	–	.29	–.08	.17
Sexism	.004	.37	.05	.09	.28*
Gender SE	–.05	–	–	–.12	–
Aggression	.003	–	–.05	–	–.06
LGB attitudes	.01	.33*	.15	.11	.11
LGB contact	–.07**	–.11	.09	.21*	.08
Trans contact	–.005	–.02	–.03	.20	.18

The presented numbers are the betas from the moderation analyses for each of the 15 study variables and transgender prejudice. Publication status: 1 = published, 2 = not published. Study type: 1 = correlation, 2 = experiment. Country: 1 = US, 2 = not US. Sample type: 1 = college student, 2 = non-college student. Gender (0 = women, 1 = men). Sexual orientation (0 = heterosexual, 1 = LGB). Higher scores indicate more transgender prejudice. SDO = social dominance orientation. RWA = right wing authoritarianism. RF = religious fundamentalism. Gender SE = gender self-esteem. LGB = lesbian, gay, bisexual

*$p < .05$, **$p < .01$, ***$p < .001$ –– = redundant predictor

CI [.76, .87]) was stronger than published studies ($r = .69$, $p < .001$, 95% CI [.62, .74]).

Study Type

The type of study was a significant moderator of the association between transgender prejudice and religiosity, β = -.09, $p = .01$, 95% CI [-.16, -.02]. There was a small effect for experimental studies ($r = .22$, $p < .001$, 95% CI [.16, .28]), and a medium effect for correlational studies ($r = .31$, $p < .001$, 95% CI [.26, .36]).

Country

Country significantly moderated the association between transgender prejudice and LGB contact, β = .21, $p = .01$, 95% CI [.05, .37], with the association having a larger effect in the U.S. ($r = -.36$, $p < .001$, 95% CI [-.40, -.33]) compared to non-U.S. countries ($r = -.18$, $p = .32$, 95% CI [-.49, .18]). Further, when country was tested as a continuous moderator (via country support), the association was stronger between LGB contact and transgender prejudice as rights increased (i.e., more contact, less prejudice), β = -.06, $p < .001$, 95% CI [-.08, -.03]. Country also moderated the association between political conservatism and transgender prejudice when tested as a continuous moderator based on the degree of transgender rights in a country, with the association becoming more positive as transgender rights increased (i.e., higher political conservatism and transgender prejudice), β = .09, $p = .02$, 95% CI [.02, .16].

Sample Type

Sample type significantly moderated the association between transgender prejudice and RWA, β = .34, $p = .001$, 95% CI [.15, .54] and sexism, β = .28, $p = .04$, 95% CI [.02, .54],]. For RWA, both effects were significant; however, non-student samples produced a stronger effect ($r = .73$, $p < .001$, 95% CI [.66, .79]) than student samples ($r = .53$, $p < .001$, 95% CI [.46, .60]). Similarly, the effects for sexism were both significant, with the effect being larger for non-student samples ($r = .61$, $p < .001$, 95% CI [.46, .72]) than student samples ($r = .40$, $p < .001$, 95% CI [.26, .52]).

Discussion

Transgender individuals experience widespread discrimination and prejudice. The current meta-analysis provides an overview of some of the most commonly tested predictors of transgender prejudice and determined the strength and direction of these associations. Sexual orientation demonstrated the largest effect size among the demographic variables, gender role beliefs demonstrated the largest effect size among the individual difference variables, and LGB attitudes had the largest magnitude among the LGB attitudes variables and this effect was the largest across all 15 predictors. Further, year, publication status, study type, country, and sample type all moderated some of the effects. Across a variety of analyses, our findings did not appear to be influenced by publication bias. In fact, even though publication bias significantly moderated the association between both religious fundamentalism and LGB attitudes with transgender prejudice, in both cases the effect was larger for unpublished studies compared to published studies, which is contrary to typical publication bias findings (i.e., unpublished studies have weaker effects than published studies; Rosenthal, 1979). However, we had a limited number of unpublished studies in our meta-analysis, which might explain why we found the opposite finding (i.e., stronger effects in the unpublished studies). Collectively, the majority of our hypotheses were supported, with the exception for the association between gender self-esteem and transgender prejudice.

Demographic Variables

Across studies, men and heterosexuals were both more likely to report more transgender prejudice compared to women and LGB + individuals, respectively. Although both rater gender and sexual orientation were significantly related to transgender prejudice, the demographic variable with the largest effect size was sexual orientation, with a medium effect compared to gender, which had a small effect. In general, men may report more transgender prejudice compared to women due to beliefs about gender and feelings of potential threats to masculinity (Harrison & Michelson, 2019). Sexual orientation may have been more strongly related to transgender prejudice compared to gender, since in general, LGB individuals are less likely to endorse traditional gender norms compared to heterosexuals (Warriner et al., 2013). The findings that both gender and sexual orientation were both related to transgender prejudice generally supports previous research. In addition, for gender specifically, the findings also shed light on the inconsistent findings regarding whether gender is related to transgender prejudice.

Political Beliefs

Political beliefs included single-item political orientation, SDO, and RWA. Collectively, all three of these variables were strongly related to transgender prejudice, with higher political conservatism, SDO, and RWA all relating to more transgender prejudice. Additionally, sample type moderated the association between RWA and transgender prejudice, with non-student samples having a larger effect than student

samples, which could be due to younger, college-aged samples having less crystalized ideology (Sears, 1986). Further, year moderated the association between political conservatism and transgender prejudice, with the association getting more positive over time. This association may become more positive as time progresses, since transgender people's identities have become more prominent in political debates (e.g., Associated Press, 2022). In general, these findings support previous research. Transgender individuals may be seen as violating social norms and traditional beliefs, as lower on the social hierarchy and as presenting ambiguously, all of which are elements that we would expect conservatives to feel negatively toward (Altemeyer, 1981; Jost et al., 2003; Pratto et al., 1994; Peterson & Zubriggen, 2010). The association between political conservatism and transgender attitudes may also be due to symbolic beliefs (Hegarty, 2002). This refers to the idea that more negative transgender attitudes are a way for political conservatives to express their political identity and more positive transgender attitudes are a way for political liberals to express their political identity, rather than transgender attitudes being a result of specific ideology underlying those identities.

Although the single-item political orientation measures capture where participants believe they lie on a continuum from very liberal to very conservative, this does not necessarily account for different types of political beliefs (e.g., social, economic). For instance, while someone may support liberal social policies, they could also endorse conservative economic values. Pew Research Center (2014, 2021) suggests that there are a number of different political typologies and that within these typologies there are similarities between the liberal and the conservative subgroups, but even on what seem to be key issues, there are differences. For instance, the progressive left (i.e., liberals who tend to vote liberal across most issues) may differ from establishment liberals (i.e., liberals who share much in common with the progressive left, but whose views may not be as strong) on issues such as racial injustice (Pew Research Center, 2014, 2021). It is also possible that single-item political orientation could be a stronger predictor of transgender prejudice in more recent years, given that transgender identities have more clearly entered into political conversations (e.g., Associated Press, 2022). Ultimately, these could be some of the reasons that single-item political conservatism was not a stronger predictor of transgender prejudice. Collectively, these findings shed light on the mixed results surrounding single-item political orientation as well as the strength of the findings with RWA and SDO.

Religious Beliefs

Religious beliefs included both religiosity and religious fundamentalism. Although both variables were strongly related to transgender prejudice, with more endorsement of religious beliefs relating to more transgender prejudice, religious fundamentalism produced the strongest effect. Although in general increased religiosity relates to more transgender prejudice, similar to single-item political orientation, single-item religiosity may not capture the nuances of various beliefs. For instance, some religions may be more accepting of trans individuals, whereas others may not, which cannot necessarily be accounted for with this type of religiosity measure. One survey found that even within the Christian Protestant denomination, there were reported differences between the belief that gender is determined by sex assigned at birth, with 84% of White Evangelicals and 59% of Black Protestants reporting this belief (Brown, 2017). Further, this lack of distinction between religious identities may be why single-item religiosity was not as strong of a predictor as religious fundamentalism. Religious fundamentalism refers to the belief that there is one set of religious teachings that are considered the truth (Altemeyer & Hunsberger, 1992), which may better assess religious beliefs without the addressing the many nuances of various religious denominations. Ultimately, these findings support previous research suggesting an association between religious beliefs and transgender prejudice.

Gender Beliefs

Across the four gender belief variables, gender role beliefs produced the effect with the largest magnitude, with greater endorsement of traditional gender role beliefs relating to more transgender prejudice. Gender role beliefs also had the largest effect across all of the individual difference variables, suggesting that beliefs about traditional gender roles may play a key role in transgender prejudice. Additionally, gender essentialism and sexism were both strong predictors of transgender prejudice, with higher endorsement of these variables relating to more transgender prejudice. In general, these findings both support previous research. However, more recent research has suggested that some gender essentialist beliefs may be associated with *less* transgender prejudice rather than more. For instance, essentialist beliefs on the naturalness of gender minority identities, such as the idea that nonbinary gender identities have always existed and that transgender people were born that way, are affirming of transgender identities and related to more positive transgender attitudes (Schudson & van Anders, 2022). Therefore, it may be that only certain types of essentialist beliefs relate to transgender prejudice, rather than essentialist beliefs in general.

Gender self-esteem was not significantly related to transgender prejudice, even after accounting for male representation within the samples, which is contrary to our hypothesis. It is possible that gender self-esteem did not

produce a significant effect, as only three of the eight studies reported 100% male representation, whereas the other studies reported anywhere from around 25–50% male representation. Perhaps there was not enough male representation across the studies including gender self-esteem for a significant effect to arise. However, it is also possible that gender self-esteem just is not as important in predicting transgender prejudice as other gender variables.

Aggression

The last individual difference predictor was aggression, which had the smallest effect among the significant predictors, with higher aggression relating to more transgender prejudice. In general, research tends to focus on levels of aggression and proneness to aggressive behavior to assess this construct; however, aggression can vary on both whether it is a state or trait variable as well as the type of aggression (e.g., physical, verbal). It is possible that aggression was not a strong predictor of transgender prejudice because the different types of aggression may influence whether aggression is related to transgender prejudice. Further, it may be that hypermasculinity may play a more important role in formation of transgender prejudice compared to aggression or proneness to aggressive behavior. Hypermasculinity tends to relate to aggressive behavior, with hypermasculine men reporting higher levels of aggressive behaviors compared to men low in hypermasculinity (Parrott & Zeichner, 2003).

LGB Attitudes

Lastly, LGB attitudes had the largest effect across all of the predictor variables, with more LBG prejudice relating to more transgender prejudice. In fact, the correlation between these two variables was extremely high, indicating that these two constructs may be indistinguishable. This link may be due to LGB + and transgender individuals being included under the larger umbrella of LGBTQ +, which may cause some individuals to conflate gender identity and sexual orientation. The strong association between the two may also be due to how they are measured. Common method variance (CMV) refers to the "systematic error variance among variables which are measured with the same source or method (Tehseen et al., 2017, p. 148). CMV can inflate the apparent association between two measures. This may be a problem particularly for assessing the link between LGB + and transgender attitudes since both are examining attitudes toward groups. For example, Cunningham and Pickett (2018) used feeling thermometers to assess attitudes toward LGB + individuals and transgender individuals. Future research should focus on the points of critical distinction between LGB and transgender attitudes.

LGB and transgender contact were also negatively related to transgender prejudice, with more contact relating to less prejudice, which generally supports previous research on the impact of contact (e.g., intergroup contact theory; Pettigrew & Tropp, 2006). Even so, it is possible that the association between contact and prejudice could be even higher than what was found here. In the current meta-analysis, we were not able to examine the differences between the amount of contact versus the quality of contact. The quality of intergroup contact (e.g., positive vs. negative) may be more important in influencing intergroup attitudes compared to the quantity of contact (e.g., Servidio et al., 2021); therefore, this variable may have been stronger if we had been able to parse out the types of contact. Additionally, year moderated the association between LGB contact and transgender prejudice, with the association becoming more negative as time progresses (i.e., more contact, less prejudice). A recent Gallup survey (Jones, 2021) suggests that more people are identifying as LGBT than in previous years, which may underlie the association between LGB contact and transgender prejudice as time passes. Further, country support also moderated the association between LGB contact and transgender prejudice, with the association getting stronger as rights increased. Earle et al. (2021) suggest that contact with LGBT people may be a better predictor of positive LGBT attitudes in countries with greater protection of LGBT rights. The non-U.S. countries included Canada, China, Greece, Belgium, India, Poland, Portugal, Thailand, Spain, Philippines, and Australia. Although some of these countries have similar or more LGBT rights to the U.S. (e.g., Canada and Australia), others have little protection for LGBT individuals (e.g., China; Mendos et al., 2020).

Limitations and Future Research

The current analysis did not distinguish between the different outcome measures used to assess transgender prejudice. However, Billard (2018) provides an argument against the validity of the main six scales that are used to measure transgender prejudice. One of the arguments against the most commonly used scale – i.e., the Genderism and Transphobia Scale (Hill & Willoughby, 2005) – is that this scale does not necessarily distinguish between various identities under the transgender umbrella (e.g., agender, nonbinary), and therefore may not tap into specific transgender prejudice (e.g., Billard, 2018; Nagoshi et al., 2008). There could be different attitudes toward various transgender identities under the umbrella; however, it is difficult to capture these specific attitudes with broad statements and misrepresentations of transgender identities. For instance, one item on the GTS includes "Masculine women make me uncomfortable," which focuses on gender expression or presentation rather than on gender identity. Given that the GTS was one of the

most frequently used scales in our analyses, this could also be why gender role beliefs was the strongest gender beliefs predictor of transgender prejudice (i.e., the GTS seems to focus more on gender role violations than transgender prejudice specifically). Future research should take the measures used to assess transgender prejudice into consideration and review if the measure is examining the specific identities of interest (e.g., binary transgender identities vs. nonbinary transgender identities). Relatedly, future research should aim to examine these various identities under the transgender umbrella, since they are not typically differentiated between in the literature and the attitudes toward specific identities may vary as well as have differing predictors.

Future research should also consider separating out transgender men and transgender women in analyses. The majority of research tends to focus on transgender people generally rather than separating out their identities as transgender men and transgender women; however, this may not capture differences in prejudice toward these groups. Although some research that has examined transgender men and women separately did not find significant differences in prejudice (e.g., Welch et al., 2016), this could have been due to modifying a scale intended to capture transgender prejudice generally to examine attitudes toward transgender men and women separately. When prejudice toward transgender men and women are examined separately on issues that are frequently discussed in political debates (e.g., transgender people using public restrooms), this may create a difference in attitudes. For instance, one study found that cisgender men reported more negative reactions toward transgender men compared to cisgender women, whereas cisgender women reported more negative reactions toward transgender women compared to cisgender men, when asked to read and respond to an imagined scenario that included using the restroom with a transgender woman or a transgender man (Callahan & Zukowski, 2019). Collectively, these findings suggest that future research examine for which issues that attitudes toward transgender men and women as well as nonbinary individuals differ and where attitudes may be similar.

In addition, intersectional identities related to ethnicity/race and gender are important to consider in future research as they affect prejudice, discrimination, and violence expressed toward transgender individuals. For example, Black transgender women are at a higher risk of being attacked by strangers than other transgender people and account for most homicides among transgender victims (Momen & Dilks, 2020). This suggests that there may be additional predictors beyond what was captured in this meta-analysis that could contribute to prejudice toward trans people of color. Additionally, transgender people also report that their experience of prejudice and identity affirmation changed based on the intersection of their racial and gender identity (e.g., a Black transgender man discussed being perceived as more dangerous after transitioning; an Asian transgender woman reported being hypersexualized after transitioning) (de Vries, 2015; Hetzel & Mann, 2021; Sevelius, 2013). Most of the studies included in this meta-analysis focused on transgender identities in general and did not specify other identities, including racial identity; therefore, exploration of the influence of intersectional identities and how predictors of attitudes toward those with multiple marginalized identities may differ warrants exploration.

Future research should also examine the differentiation between transgender prejudice and LGB prejudice. In the current analysis, the association between these variables was strong. Therefore, it is essential to examine when attitudes toward LGB and transgender individuals may vary. For instance, transgender individuals in sports may be one area that there are differences in attitudes between those with marginalized gender and sexual identities. One study found that transgender participation in sports was viewed more negatively among sports fans and that both men and women sports fans responded similarly in their attitudes toward transgender participation (Flores et al., 2020). Although, the other predictors in their study were similar to what was included in the current analysis (e.g., gender role beliefs), it is possible that attitudes toward sports participation could differ for transgender and LGB individuals.

Practice Implications

The current meta-analysis has both theoretical and practical implications. Although transgender prejudice is a relatively new area of research in psychology, the number of studies has dramatically increased over the past decade. One important theoretical contribution is to understand the strength of the association between transgender prejudice and some of the most commonly investigated predictors as well as bring insight into existing inconsistencies in the literature. The current meta-analysis helps shed light on these associations, which can ultimately guide future research and help determine the types of interventions (e.g., ally trainings) that may help decrease transgender prejudice.

One practical implication of the findings from this analysis is the influence of contact on transgender prejudice. The current analysis did not account for quality of contact due to lack of data focusing on quality; however, contact was still significantly associated with transgender prejudice, with more contact relating to less prejudice. These findings suggest that increasing contact with transgender individuals could help improve attitudes toward transgender people. One way to do this could be as simple as including representations in the media as this allows for a large outreach. Indeed, Gillig et al. (2018) found that watching transgender storylines related to lower transgender prejudice as well as more positive attitudes toward transgender

policies. Additionally, instructors could potentially increase awareness and representation of transgender identities in the classroom by including transgender individuals in classroom examples. Although this may seem like a small way to incorporate discussion of transgender identities into the classroom, it could provide some students with their first exposure to transgender identities. Further, workplaces and academic settings could incorporate these findings by implementing diversity and ally trainings focused on transgender identities as these trainings can further increase exposure to and education of transgender identities. Ultimately, this may encourage people to learn more about transgender identities, thereby potentially decreasing transgender prejudice.

Another implication of this analysis is the finding that transgender prejudice may be influenced by cultural factors. More specifically, country moderated the association between LGB contact and transgender prejudice when examined as a binary and continuous moderator (via country support) as well as single-item political orientation and transgender prejudice when examined as continuous moderator. These findings suggest that cultural factors that influence the laws and policies affecting transgender prejudice play a role in attitudes toward transgender individuals. For instance, even within the US, there have been recent bans on trans rights that could influence people's attitudes toward transgender individuals. In some US states, there are bills that have been passed that restrict trans rights (e.g., House File 2416 in Iowa banning trans girls and women playing in K-12 and college sports, respectively; House File 2416, H.F. 2416, Committee on Education, 2022). These bans could have negative impacts on people's perceptions of trans individuals. Perhaps, policymakers can target the cultural factors that influence transgender prejudice (e.g., gender beliefs) and increase awareness and acceptance of transgender individuals by focusing on the predictors that were most strongly associated with transgender prejudice in this analysis. In addition, future research should examine the longitudinal impacts of attitudes toward transgender individuals as laws and policies impacting transgender people change. Ultimately, taking into account political and cultural factors may help guide policymakers in their arguments in support of transgender individuals.

Conclusion

Transgender individuals experience prejudice and discrimination; therefore, the variables that influence transgender prejudice were examined to better understand and ultimately potentially decrease transgender prejudice. Collectively, the findings from this meta-analysis can guide interventions on decreasing transgender prejudice by not only focusing on transgender specific attitudes (e.g., via increasing LGB and trans contact), but also focusing on various beliefs (e.g., gender role beliefs). Additionally, these findings suggest the targets of those interventions may be best focused on those with more transgender prejudice – e.g., men, heterosexuals, those higher in political conservatism. Further, we provided support for most previous research and summarized the strength of the associations between the predictor variables and transgender prejudice as well as provided insight on the contradictory findings in the literature. Our analysis is the first to date to collectively summarize predictors of transgender prejudice and provides potential information to incorporate into practice.

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Authors' Contribution All authors contributed to the study conception and design. The first two authors computed effect sizes for the raw data, computed overall effect sizes across studies, and prepared the manuscript. Additionally, the first author along with two undergraduate research assistants coded the published articles used in the analyses. Lastly, the last two authors also contributed to the manuscript preparation.

Data Availability The data that support the findings of this project are available from the corresponding author upon request.

Declarations

Ethics Approval/Consent No original data were collected from participants; therefore, this project did not undergo review by the Institutional Review Board approval. There was also no informed consent due to the nature of the project.

Competing Interests The authors have no known conflicts of interest.

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References denoted one asterisk (*) were both cited in the paper and included in the meta-analysis. References denoted by two asterisks (**) were included in the meta-analysis only (i.e., not cited in the paper). See online supplement for a list of all studies along with the variables included in each analysis.

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