Implicit transgender attitudes independently predict beliefs about gender and transgender people

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Abstract

Surprisingly little is known about transgender attitudes, partly due to a need for improved measures of beliefs about transgender people. Four studies introduce a novel Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) assessing implicit attitudes towards transgender people. Study 1 ($N = 294$) found significant implicit and explicit preferences for cisgender over transgender people, both of which correlated with transphobia and transgender-related policy support. Study 2 ($N = 1094$) found that implicit transgender attitudes predicted similar outcomes among participants reporting no explicit preference for cisgender versus transgender people. Across Study 3a ($N = 5647$) and Study 3b ($N = 2276$), implicit transgender attitudes predicted multiple outcomes, including gender essentialism, contact with transgender people, and support for transgender-related policies, over and above explicit attitudes. This work introduces a reliable means of measuring implicit transgender attitudes and illustrates how these attitudes independently predict meaningful beliefs and experiences.

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Implicit transgender attitudes independently predict gender and transgender-related beliefs

On January 9th 2019, a transgender woman (i.e., whose gender identity differed from that assigned at birth) was assaulted in a North Carolina bathroom by two cisgender women (i.e., whose gender identity matched that assigned at birth). This altercation followed the 2017 repeal of North Carolina H.B.2 (the “bathroom bill” requiring people to use restrooms matching gender assigned at birth), and its replacement by one preventing cities from enacting laws protecting transgender people (Brice-Saddler, 2019). Roughly half of one percent of the American adult population identifies as transgender, and between 2-5% experience gender dysphoria (a disconnection between gender identity and identity assigned at birth; Gates, 2011; Van Kesteren et al., 1996). Though people increasingly report knowing a transgender person (Halloran, 2015), transgender people continue to be victims of discrimination, including efforts to restrict public bathroom access (Associated Press, 2016) and ban military service (Diamond, 2017).

Do people’s personal feelings, both implicit and explicit, about transgender people relate to how likely they are to support policies related to the treatment of transgender people, such as “bathroom bans”? In the present work, we develop and validate a measure of implicit transgender attitudes, and explore how implicit transgender attitudes predict support for such policies and other transgender-related beliefs.

Explicit Attitudes towards Transgender People

Self-reported attitudes are known to influence policy support in many domains (e.g., Lax & Phillips, 2009), but relatively little is known about self-reported attitudes towards transgender people. In one nationally representative sample, Americans’ attitudes towards transgender people were less warm than attitudes towards lesbian or gay people (Norton & Herek, 2013). Negative

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attitudes towards transgender people are particularly pronounced among political conservatives (Norton & Herek, 2013), more religious people (Kanamori et al., 2017; Nagoshi et al., 2008), older people (Landen & Innala, 2000), and heterosexuals (Willoughby et al., 2010). Moreover, feelings of disgust toward transgender bodies predict opposition to transgender rights policies (Miller et al., 2017).

Self-reported transgender attitudes are strongly related (but not identical) to people's attitudes towards lesbian and gay people (Nagoshi et al., 2008; Norton & Herek, 2013; Willoughby et al., 2010). People who have greater personal contact with sexual minorities (e.g., lesbian, gay, and bisexual people) report more positive attitudes towards transgender people (Flores, 2015; Norton & Herek, 2013). Evidence for a similar effect for transgender contact is more mixed. Personal contact with transgender people has been associated with increased positivity in most, but not all, prior studies (King et al., 2009; Tompkins et al., 2015; Willoughby et al., 2010; cf., Flores, 2015).

Explicit attitudes about transgender people are also, unsurprisingly, related to broader beliefs about gender. Endorsement of the gender “binary”, or the belief that only two genders exist, is associated with more negative attitudes towards transgender people (Norton & Herek, 2013), while people who believe in a biological basis for transgender identity tend to report more positive attitudes (Landen & Innala, 2000).

The Role of Implicit Transgender Attitudes

With only one exception, prior work on transgender-related beliefs has examined their association with *explicit* transgender attitudes (i.e. attitudes consciously experienced and recognized as one's own; Greenwald & Banaji, 1995). However, these outcomes may also be related to *implicit* transgender attitudes (i.e. automatically activated associations; Gawronski &

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Bodenhausen, 2007). Prior research has shown that implicit and explicit attitudes represent distinct but related constructs (e.g., Nosek & Smyth, 2007), as implicit and explicit intergroup attitudes can diverge (Jost et al., 2004), change at varying rates (Charlesworth & Banaji, 2019), and differentially correlate with behavior (Kurdi, Seitchik et al., 2019; c.f., Oswald et al., 2013).

A growing area of research has begun documenting implicit and explicit gender attitudes of both cisgender and transgender people. For example, a study of transgender children (Olson, Key & Eaton, 2015) found more positive implicit gender attitudes towards a child's expressed gender than towards their gender assigned at birth; similar results emerged when using a measure of implicit gender identity (Gülgöz et al., 2019). This work reveals how both explicit and implicit gender cognition corresponds with experiences of gender transitions, but the development of implicit measures of transgender attitudes is noticeably lacking compared to corresponding explicit measures.

In fact, the only existing measure of implicit transgender attitudes (Wang-Jones et al., 2017; Wang-Jones et al., 2018) used an Implicit Association Test (IAT; Greenwald, McGhee & Schwartz, 1998), and found that implicit attitudes towards “transsexual men” and “transsexual women” correlate reliably but weakly with explicit attitudes. However, this implicit measure had features that limit its generalizability. Wang-Jones et al. (2018), measured attitudes not towards “transgender people,” but toward “transsexual men” (vs “biological men”) and “transsexual women” (vs “biological women”). Because category labels strongly influence implicit attitude measurement (Govan & Williams, 2004), comparing associations towards “transgender people” (vs “cisgender people”) likely captures different attitudes than those towards “transsexual men” (vs “biological men”) and “transsexual women” (vs “biological women”). These latter labels base category membership on the status of a person's genitals (rather than gender) and invoke

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derogatory stereotypes. In addition, this prior measure assesses attitudes towards transgender men and women separately rather than towards transgender people as a whole. Previous intergroup research has shown that attitudes toward subgroups can be very different than stereotypes of the group (i.e. Black people and Black women; Cuddy, Fiske, Glick & Xu, 2002; Sesko & Biernat, 2010). While considering intersectionality and the differential experiences of transgender men versus women is important (Worthen, 2013), it is also critical to understand evaluations of transgender people more globally.

Moreover, there is currently limited evidence that implicit transgender attitudes predict transgender-related beliefs after controlling for explicit attitudes. Such evidence would suggest that implicit attitudes play an independent role in individuals' beliefs about transgender people, with potentially unique causes driving their development. Most prior investigations into this issue of incremental predictive validity for implicit attitudes (including Wang-Jones et al., 2017) relied on least squares linear regression, an analysis strategy known to inflate false positives (Westfall & Yarkoni, 2016) due to inability to account for measurement reliability. Establishing the incremental predictive validity of transgender attitudes via more appropriate analysis strategies would provide evidence for the predictive validity of both implicit transgender attitudes as well as implicit associations measures in general.

The Current Work

We sought to develop the first measure of implicit attitudes towards transgender people as a single category, and determine whether implicit transgender attitudes predict important beliefs and behavior above and beyond explicit attitudes. We developed two versions of an IAT, with stimuli consisting of either images or text. Across four studies, we find robust evidence for anti-transgender implicit attitudes, and that such attitudes—particularly when measured using

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images of prominent cisgender and transgender people— are associated with a variety of beliefs and behaviors concerning transgender people and gender more broadly.

Drawing from prior efforts to validate IATs and other measures, we used a number of criteria to compare whether the image-based or text-based IAT was a superior measure of implicit transgender attitudes. We focus on four criteria for evaluating the two IATs: predictive and convergent validity; mean-level effects; known-groups differences; and internal reliability. Below, we briefly review the logic behind each as a means of evaluating a measure's validity.

Predictive and convergent validity. A better measure of a construct should correlate more strongly with related measures due to reduced measurement error. Just as the correlation between height and weight – two distinct but related constructs - is weakened when error is introduced into measurement, more precise measures of implicit attitudes should maximize associations with related self-report measures. This reasoning holds for tests of convergent validity, which involves measures that are at the same conceptual level (e.g., implicit and explicit measures of attitudes towards transgender people), as well as predictive validity, which involves measures of related concepts (e.g., transgender attitudes and support for transgender-related policies).

Prior work finds self-reported attitudes towards transgender people are correlated with outcomes like support for the gender “binary” (Norton & Herek, 2013), and prior contact with transgender people (King, Winter, & Webster, 2009). Since past studies have shown consistent correlations between implicit and explicit attitudes across domains (Nosek, 2005), implicit transgender attitudes should be correlated with these and other self-reported outcomes related to transgender people (e.g., policy support, transphobia), particularly given robust evidence that IATs in general are associated with such outcomes (Kurdi, Seitchik et al., 2019). Measures that best reduce random error will strengthen these correlations, so IATs that produce stronger

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correlations with related outcomes should be considered better measures of the construct. See Axt (2018) for parallel reasoning when evaluating measures of explicit racial attitudes.

Mean-level effects. A better measure of a construct should be more sensitive to the assessed construct. As prior work finds general anti-transgender attitudes in self-report (Norton & Herek, 2013), it is reasonable to expect anti-transgender attitudes in measures of implicit attitudes, especially given implicit intergroup attitudes generally exhibit stronger levels of favoritism than explicit intergroup attitudes (e.g., Nosek, 2005). Similar reasoning has been used as a criterion for evaluating IATs related to gender and age attitudes (Greenwald, Nosek & Banaji, 2003), and assumes that the modal response tendency (i.e., preferences for cisgender over transgender people) reflects population differences in association strength. That is, since the general population on average shows preferences for cisgender over transgender people, noise in measurement will only weaken the capacity to detect this preference. Mean-level effects (e.g., overall preferences for White versus Black people) have also been used to compare the relative validity of several measures of implicit attitudes assumed to assess the same construct (e.g., implicit racial attitudes; Bar-Anan & Nosek, 2014). The same reasoning applies here; if two measures are designed to tap into the construct of implicit transgender attitudes, the one that produces larger average levels of anti-transgender attitudes should be superior.

Known-groups differences. A better measure of a construct should reliably vary between groups known to differ on that construct. There are known differences between groups in explicit transgender attitudes, specifically that 1) cisgender people report more negative transgender attitudes than transgender people, and 2) straight people report more negative transgender attitudes than gay or lesbian people (Willoughby et al., 2010). Again, it is reasonable to assume these differences also exist in implicit attitudes, particularly given past work finding robust

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intergroup differences in domains like race (e.g., Nosek et al., 2007) and sexuality (e.g., Jost et al., 2004).

The observed magnitude of the difference between groups is underestimated when there is noise in measurement. As a result, measures that minimize measurement error will maximize the differences in attitudes between transgender versus cisgender participants, as well as straight versus gay or lesbian participants, though this analysis assumes that measurement error is not confounded with gender identity or sexual orientation (Nosek et al., 2014). Given this assumption, measures that show larger group differences will thus be considered superior measures. A similar approach of comparing strength of known-group differences has been used when evaluating measures of explicit racial attitudes (Axt, 2018), measures of implicit political attitudes (Bar-Anan & Nosek, 2014), or scoring algorithms for a single implicit measure (Nosek et al., 2014).

Internal reliability. Greater internal reliability does not guarantee superior measure of a construct, but all else equal, measures with greater internal reliability reduce measurement error. IATs with greater internal reliability would then be superior measures of the construct, provided that the IAT also fares comparably well in the above criteria (see Sriram & Greenwald, 2009, for a similar approach in evaluating implicit attitudes about consumer preferences).

Study 1

Study 1 compared two IATs measuring implicit evaluations of transgender versus cisgender people. The first IAT used images of cisgender and transgender celebrities. There are potential drawbacks to using celebrity images as stimuli. For instance, if people are unfamiliar with the celebrities, it may lead to difficulty in categorization, marked by weak internal

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reliability. Therefore, Study 1 compared the celebrity image-based transgender IAT to a text-based IAT using words related to transgender and cisgender people.

Method

Participants

306 volunteers at Project Implicit (<https://implicit.harvard.edu>) completed both IATs. We sought a sample that would provide more than 80% power for detecting a small within-subjects effect of $d = .20$. Participants completed demographics as part of registration ($M_{\text{Age}} = 38.7$, $SD = 14.2$; 71.6% White; 55.2% female; 59.8% US citizens). Degrees of freedom vary due to missing data. Data, materials and analysis syntax for all studies are available at https://osf.io/rcgdx/?view_only=f0006dce1e3849f59b97bd1bf063e074.

Measures

Implicit transgender attitudes. Implicit attitudes were measured using a seven-block IAT. Each participant completed two IATs: an image version and a text-only version. In both versions, attributes were Good words (“Nice”, “Pleasure”, “Laughter”, “Glorious”) or Bad words (“Nasty”, “Agony”, “Hurt”, “Rotten”). Both IATs used category labels of “Transgender people” and “Cisgender people” (see online supplement for table detailing block structure).

Stimuli in the image IAT consisted of eight celebrities (four cisgender, four transgender) matched on race, approximate age, and popularity (estimated from Google search returns). To increase familiarity with the stimuli, participants were shown brief descriptions of each and completed a 24-trial training block sorting the images (labeled as cisgender or transgender) into cisgender or transgender categories. See Appendix A for stimuli and descriptions.

Stimuli in the text-based IAT consisted of words related to cisgender people (“Cisgender people”, “Cisgender”, “Cismen”, “Ciswomen”) and transgender people (“Transgender people”,

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“Transmen”, “Transwomen” “Trans”), and did not include a training block. IATs followed the design recommended in Nosek, Greenwald, & Banaji (2007) and were scored by the *D* algorithm (Greenwald, Nosek, & Banaji, 2003), such that more positive scores indicated more positive associations with cisgender versus transgender people. Data from nine participants were excluded from analyses due to having more than 10% of trials faster than 300 milliseconds on either IAT (Nosek et al., 2007).

Explicit transgender attitudes. Participants reported their preference between cisgender and transgender people (-3= “I strongly prefer transgender to cisgender people”, +3 = “I strongly prefer cisgender to transgender people”). Warmth towards transgender and cisgender people separately was measured using two thermometer items (1 = “Very cold”, 7 = “Very warm”).

Support for policies affecting transgender people. Participants reported agreement with five transgender-related policies (1= “Strongly disagree”; 7= “Strongly agree”): bathroom use, adoption rights, insurance coverage for transgender care, ability to dress in a manner matching expressed gender, and obtaining new identification. Higher scores indicated greater agreement with policies allowing more freedom to transgender people ($\alpha = .87$; see Appendix B).

Self-reported Transphobia. The nine-item Transphobia scale (Nagoshi et al., 2008) includes items such as “I think there is something wrong with a person who says that they are neither a man nor a woman” (1= “Strongly disagree”, 7= “Strongly agree”). Higher scores indicated greater transphobia ($\alpha = .86$).

Procedure

Participants completed the IATs in randomized order, followed by the self-report measures in randomized order.

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Results

We compared the IATs on internal reliability and D scores. We computed Cronbach's alpha (Cronbach, 1955) for each IAT by matching the 60 critical trials in blocks 3-4 with the 60 critical trials in blocks 6-7, then dividing these trials into three parcels of 20 trials (first 20 trials of blocks 3-4 and first 20 trials of blocks 6-7 into the first parcel, etc.) and computing D scores for each parcel.

Both IATs exhibited acceptable internal reliability. The image IAT ($\alpha = .72$) was slightly more reliable than the text-based IAT ($\alpha = .70$), but a Feldt (1969) test found the measures did not reliably differ, $W = 0.95$, $p = .337$.

Both IATs found more positive implicit associations for cisgender versus transgender people on average (Image: $t(305) = 13.57$, $p < .001$, $d = .78$); Text: $t(305) = 6.86$, $p < .001$, $d = .39$). However, the image IAT ($M = .31$, $SD = .39$) produced larger effects than the text IAT ($M = .17$, $SD = .42$), $t(305) = 5.26$, $p < .001$, $d = .30$, 95% CI [.19, .42].

Finally, both IATs reliably correlated with each other ($r = .33$, $p = .001$), as well as self-reported warmth towards transgender people, relative preferences between cisgender and transgender people, transphobia, and support for transgender-related policies (all $|r|$'s $> .15$, all p 's $< .014$, see Table 1 for correlation matrix and descriptive statistics). There were no reliable differences between the IATs in correlations with warmth towards transgender people ($t(292) = -0.23$, $p = .818$), warmth towards cisgender people ($t(288) = -0.27$, $p = .789$), explicit preferences between transgender and cisgender people ($t(289) = 0.31$, $p = .975$) or transphobia ($t(276) = 0.56$, $p = .573$). The image IAT was marginally more correlated with support for transgender policies than the text IAT, $t(278) = 1.91$, $p = .057$.

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Table 1
Descriptive Statistics and Correlations among Study 1 Measures (N = 260)

Measure	Mean	SD	1	2	3	4	5	6	7
1. Image IAT <i>D</i> -score	0.31	0.39	-	[.22, .44]	[-.09, .16]	[-.27, -.03]	[.13, .35]	[-.39, -.17]	[.15, .38]
2. Text IAT <i>D</i> -score	0.17	0.42	0.33	-	[-.07, .17]	[-.28, -.05]	[.12, .35]	[-.27, -.03]	[.11, .34]
3. Warmth for cisgender	5.27	1.34	<i>ns</i> 0.04	<i>ns</i> 0.05	-	[.21, .43]	[.17, .39]	[-.14, .10]	[-.03, .21]
4. Warmth for transgender	4.88	1.40	-0.15	-0.17	0.32	-	[-.57, -.39]	[.41, .59]	[-.68, -.53]
5. Relative preference	4.58	1.03	0.24	0.24	0.29	-0.49	-	[-.57, -.39]	[.49, .65]
6. Policy Advocacy	5.84	1.36	-0.29	-0.16	<i>ns</i> -0.02	0.51	-0.48	-	[-.76, -.58]
7. Self-reported transphobia	2.89	1.27	0.27	0.22	<i>ns</i> 0.09	-0.61	0.57	-0.68	-

Note. *ns* denotes a correlation where $p \geq .05$. All other correlations significant at $p < .05$.

Discussion

Two IATs assessing implicit transgender attitudes showed more negative associations with transgender versus cisgender people. Each measure correlated with explicit attitudes towards transgender people and beliefs about their treatment. The IATs reliably correlated with each other, providing evidence of convergent validity. However, the degree to which the two measures correlated with each other ($r = .33$) was lower than the test-retest value observed in a recent IAT meta-analysis ($r = .50$; Greenwald & Lai, 2020). Follow-up research will need to clarify the degree to which this discrepancy is a result of methodological differences between the two tasks (e.g., different stimuli) versus the topic of transgender versus cisgender attitudes (e.g., transgender attitudes may be lower in elaboration; Nosek, 2007).

The IATs had comparable internal reliability, but the image-based IAT produced greater mean-level biases against transgender people and was a slightly better predictor of support for transgender policies. This is suggestive evidence that the image-based IAT is a superior measure of implicit transgender attitudes, but Studies 2 and 3 use both IATs to provide further tests of comparative validity.

In Study 2, we sought to provide a stronger test of the predictive validity of implicit transgender attitudes by investigating whether each IAT predicted transphobia and support for policies concerning transgender people in a sample with no self-reported preference between cisgender and transgender people. If the IAT is simply an alternative way of measuring the same attitudes people report explicitly, then it should not predict outcomes in a sample reporting no explicit preferences. In contrast, if implicit transgender attitudes predict outcomes even among participants reporting no explicit preferences, it would provide further evidence that implicit transgender attitudes are distinct from explicit attitudes. We applied the same evaluation criteria

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used in Study 1, as these criteria apply equally when measuring implicit attitudes among a sample of participants who report no explicit preferences for or against transgender people.

Study 2

Method

Participants

Participants were volunteers at Project Implicit. Participants were first asked for their relative explicit preference for cisgender versus transgender people. Only those reporting no preference for transgender versus cisgender people (58.2%) were eligible to continue. In total, 1117 participants ($M_{\text{Age}} = 34.95$, $SD = 14.0$; 68.5% White; 68.8% female; 65.7% US citizens) provided usable IAT data, which for each IAT provided more than 95% power for detecting a correlation as small as $r = .15$. Nineteen participants were removed from analyses using the same criteria as Study 1.

Measures

Participants completed the same IATs, self-reported transphobia ($\alpha = .84$) and policy support ($\alpha = .85$) as Study 1. Participants also separately reported how much they liked or disliked transgender and cisgender people (1 = Strongly dislike; 7 = Strongly like). Participants were randomly assigned to complete the image or text-based IAT.

Procedure

Following the explicit preference screening item, participants completed the IAT and then all other measures in a randomized order.

Results

As in Study 1, both IATs found more positive implicit associations for cisgender versus transgender people, with the image IAT ($M = .20$, $SD = .42$) producing larger effects than the text IAT ($M = .12$, $SD = .41$), $t(1092) = 3.41$, $p < .001$, $d = .21$, 95% CI [.09, .32].

The image IAT ($\alpha = .76$) was also more reliable than the text IAT ($\alpha = .66$), $W = 0.71$, $p < .001$. Both IATs reliably correlated with self-reported transphobia, though only the image IAT correlated with liking of transgender people and policy support (see Table 2 for correlation matrix and descriptive statistics), and neither IAT correlated with liking of cisgender people. The image IAT had a stronger correlation with transphobia (Fisher's $Z = 2.82$, $p = .005$) and liking of transgender people (Fisher's $Z = 2.94$, $p = .003$) than the text IAT, but not with policy support (Fisher's $Z = 1.47$, $p = .142$) or liking of cisgender people (Fisher's $Z = -1.45$, $p = .147$).

Discussion

Even in a sample reporting no explicit preferences for cisgender versus transgender people, we found evidence for significant *implicit* preferences for cisgender over transgender people. These implicit attitudes predicted self-reported transphobia and support for transgender-related policies for the image (though not the text) IAT. Results suggest that implicit transgender attitudes may play a unique role in understanding beliefs about transgender people.

Study 2 found further evidence for the superior validity of the image IAT, as seen in greater internal reliability, larger D scores indicating pro-cisgender implicit attitudes, and stronger correlations with self-reported transphobia and liking of transgender people.

We build on this work in Study 3a by including both IATs, a wider range of self-report measures, and tests of known-groups differences. In addition, we sought statistically robust evidence that implicit transgender attitudes predict such outcomes beyond explicit transgender

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Table 2

Descriptive Statistics and Correlations among Measured Variables in Study 2

Measure	Mean	SD	1	2	3	4	5	6
1. Image IAT <i>D</i> -score	0.20	0.42	-	-	[-.13, .05]	[-.29, -.13]	[-.24, -.07]	[.18, .34]
2. Text IAT <i>D</i> -score	0.12	0.41	-	-	[-.04, .13]	[-.12, .05]	[-.15, .02]	[.01, .18]
3. Liking for cisgender	5.15	1.28	-.04 _{ns}	.05 _{ns}	-	[.68, .74]	[.13, .24]	[-.21, -.09]
4. Liking for transgender	5.19	1.30	-.21	-.04 _{ns}	.71	-	[.26, .37]	[-.42, -.31]
5. Policy advocacy	6.06	1.19	-.15	-.06 _{ns}	.18	.31	-	[-.59, -.51]
6. Self-reported transphobia	2.50	1.06	.26	.09	-.15	-.37	-.44	-

Note. _{ns} denotes a correlation where $p \geq .05$. All other correlations significant at $p < .05$.

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attitudes by relying on structural equation modeling analyses that account for measurement reliability (Westfall & Yarkoni, 2016). We also included tests of model fit to investigate whether implicit and explicit transgender attitudes are best conceived as a single construct, two independent constructs, or two distinct-but-related constructs (Nosek & Smyth, 2007). Finally, Study 3a included a sample of transgender participants.

Study 3a

Method

Participants

5647 Project Implicit volunteers ($M_{\text{Age}} = 31.5$, $SD = 13.0$; 72.3% White; 60.1% female; 72.3% US citizens) provided eligible IAT data for the study, which was the “featured task” on the site’s front page. We collected data until there were at least 30 transgender participants with usable IAT data for each IAT and at least 450 participants completing each outcome measure to facilitate SEM analyses (Kline, 2005). Due to delays in study replacement, the final sample was slightly larger, providing at least 80% power for detecting a correlation as small as $r = .13$.

Measures and Procedure

Participants completed the following measures in randomized order.

Implicit transgender attitudes. Participants completed either the image or text IAT. For SEM analyses, the implicit construct was estimated by four indicators, created by dividing each IAT block into four bins and calculating D scores for each. Participants were excluded from analyses using the same criteria as Study 1 (2.7% of IAT scores).

Explicit transgender attitudes. Participants completed the relative explicit preference item and thermometer items from Study 1. Participants also completed the two liking items of transgender and cisgender people from Study 2. The explicit construct was estimated by three

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(standardized) indicators: the explicit preference item, a difference score between thermometer items, and a difference score between liking items ($\alpha = .87$). Difference scores were calculated such that more positive scores indicated more warmth or liking of cisgender people. For least squares linear regression and correlational analyses, we calculated an explicit attitude variable by averaging the three standardized variables.¹

Demographics. Participants completed a 14-item demographics questionnaire, including sexual orientation, gender identity, age, race, ethnicity, and country of citizenship (all variables available in the online dataset). One item assessed sexual orientation; participants reported whether they identified as heterosexual or straight (73.8%), lesbian or gay (6.3%), bisexual (11.8%), queer (5.0%) or belonging to another sexual orientation (3.1%).

Two items assessed gender: participants first reported sex assigned at birth (male or female), followed by current gender identity (male, female, trans male/ trans man, trans female/ trans woman, genderqueer/ gender nonconforming, a different identity). Participants could select multiple categories. Participants were categorized as cisgender (86.8%) if sex assigned at birth matched current gender identity. Participants were categorized as transgender (1.6%) if they either 1) reported their gender identity as “trans male/ trans man” or “trans female/ trans woman” (and did not report their gender identity as “genderqueer” or “a different identity”), or 2) reported their gender identity as male or female, and this differed from the sex assigned at birth.

Outcome measures. Participants were randomly assigned to complete two of eight measures (see Appendix C for wording and scoring information):

¹ Study 3a also included items regarding cisgender and transgender men and women (see online dataset).

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1) ***Support for four transgender-related policies*** (16-items; adapted from Roberts et al., 2017): transgender people serving in the military, transgender bathroom bans, university-provided counseling services for transgender people, and banning “trans panic” as a legal defense. Responses were averaged ($\alpha = .92$); higher values indicate more agreement with policies supportive of transgender people.

2) ***Past experience or willingness to have a romantic relationship*** with a transgender person (5 items; $\alpha = .89$). Higher values indicated greater willingness or experience.

3) ***Previous or current contact with transgender people*** (4 items; $\alpha = .64$)²; higher values indicated more contact.

4) ***Misconceptions about transgender people*** (20 items; $\alpha = .93$; sample items: “Transgender people are confused about their sexuality,” “Transgender people are trying to trick others”); higher values indicate greater endorsement of misconceptions.

5) ***Transgender Attitudes and Belief Scale*** (TABS; Kanamori et al., 2017; 29 items, $\alpha = .95$; sample item: “A person does not have to be clearly male or female to be normal and healthy”); higher values indicate more positive attitudes/beliefs about transgender people.

6) ***Gender Essentialism*** (Hettinger, 2014; 5 items, $\alpha = .77$, sample item: “Masculinity and femininity are mutually exclusive categories, and each person either belongs to one or the other”); higher scores indicate greater essentialism.

7) ***Ambivalent Sexism Inventory*** (Glick & Fiske, 1996; 22 items): Hostile Sexism ($\alpha = .91$) and Benevolent Sexism ($\alpha = .84$) subscales. Higher scores indicate greater sexism.

An additional measure of familiarity with the image IAT stimuli is available in the online dataset but was not included in primary analyses.

² This measure also included items about contact with gay and bisexual people (available online).

Results

Internal Reliability

Again, the image IAT had a higher internal reliability ($\alpha = .80$) than the text-based IAT ($\alpha = .70$), $W = 0.68$, $p < .001$.

Ingroup Favoritism Among Transgender and Cisgender Participants

Among cisgender participants, the image IAT ($M = .20$, $SD = .45$) produced stronger anti-transgender attitudes than the text IAT ($M = .12$, $SD = .41$), $t(5035) = 6.79$, $p < .001$, $d = .19$, 95% CI [.14, .25].

Both IATs also showed ingroup favoritism among transgender participants (Image $N = 41$, $M = -.20$, $SD = .49$, $t(40) = 2.63$, $p = .012$, $d = .41$; Text $N = 47$, $M = -.33$, $SD = .38$, $t(46) = -5.92$, $p < .001$, $d = .86$), though the two IATs did not reliably differ in strength of ingroup favoritism, $t(86) = 1.38$, $p = .170$, $d = .30$, 95% CI [-.13, .72].

Known Groups Differences in Transgender Attitudes

On the relative preference item, cisgender ($M = .57$, $SD = 1.05$) and transgender participants ($M = -0.79$, $SD = 1.29$) both demonstrated explicit ingroup favoritism (all t 's > 5.75 , all p 's $< .001$, all d 's $> .59$; see online supplement for individual tests), which reliably differed between groups, $t(4888) = 11.86$, $p < .001$, $d = 1.16$. This finding mirrors prior research (Willoughby et al., 2010).

For implicit attitudes, IAT version did not moderate relative differences between cisgender and transgender participants. A 2 (IAT Type) by 2 (Gender Identity) ANOVA found a reliable main effect of gender identity, $F(1, 5121) = 83.88$, $p < .001$, $\eta_p^2 = .016$, and a reliable main effect of IAT version, $F(1, 5121) = 5.12$, $p = .024$, $\eta_p^2 = .001$, but no interaction between IAT type and gender identity, $F(1, 5121) = 0.24$, $p = .627$, $\eta_p^2 < .001$. That is, the image IAT ($d =$

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.86) and text-based IAT ($d = 1.13$) did not reliably differ in ability to detect differences in implicit attitudes between transgender and cisgender participants.

For explicit attitudes among gay and straight participants, straight participants preferred cisgender over transgender people ($d = .62$), while gay participants showed no reliable preference ($d = .08$, see online supplement for individual tests). These attitudes reliably differed, $t(4125) = 9.94, p < .001, d = .60$, again replicating prior work (Willoughby et al., 2010).

For implicit attitudes, IAT type significantly moderated the relative difference between gay and straight participants in implicit transgender attitudes. A 2 (IAT Version) by 2 (Sexual Orientation) ANOVA revealed a main effect of sexual orientation, $F(1, 4330) = 80.60, p < .001, \eta^2 = .018$, no main effect of IAT version, $F(1, 4330) = 1.38, p = .239, \eta^2 < .001$, and a sexual orientation by IAT version interaction, $F(1, 4330) = 13.45, p < .001, \eta^2 = .003$. The image IAT produced a larger difference between gay and straight participants in implicit attitudes ($d = .66$) than the text IAT ($d = .31$). See Table 3 for descriptive statistics of Study 3a measures.

Correlations between transgender attitudes and outcome measures

IAT D scores and the explicit preference variable reliably correlated with all outcome measures in the expected direction (all $|r|$'s $> .12$, all p 's $< .003$). See Table 4 for correlations between each IAT and self-report measure, and Fisher's Z tests comparing the strength of the correlation between IATs. The image IAT was more strongly correlated with three of the nine self-report outcome variables than the text IAT, and the text IAT failed to have a stronger correlation with any outcome.

Incremental predictive validity of the Transgender IAT

We first tested for incremental predictive validity using traditional least squares linear regression, predicting each outcome from participants' IAT D score and aggregate explicit

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Table 3

Descriptive Statistics and Correlations (r) With IAT D Scores

Measure	Mean	SD	Corr. with Image IAT D	Corr. with Text IAT D	Fisher's Z
1. Explicit attitudes (Range: -3.6 – 3.4)	-0.01	0.88	.36 [.33, .40]	.35 [.32, .38]	0.63, $p = .529$
2. Policy support (Range: 1-7)	5.61	1.20	-.30 [-.38, -.22]	-.31 [-.39, -.23]	-0.16, $p = .873$
3. Relationship interest (Range: 0-5)	1.74	1.89	-.37 [-.44, -.29]	-.27 [-.34, -.19]	1.80, $p = .072$
4. Transgender contact (Range: 0-4)	1.67	1.18	-.31 [-.38, -.23]	-.20 [-.28, -.12]	1.93, $p = .054$
5. Attitude and Belief Scale (Range: 1-5)	4.36	0.72	-.36 [-.43, -.28]	-.33 [-.40, -.25]	0.48, $p = .631$
6. Transgender misconceptions (Range: 1-7)	2.03	0.98	.30 [.22, .37]	.24 [.16, .31]	1.07, $p = .285$
7. Gender essentialism (Range: 1-7)	2.96	1.32	.28 [.20, .35]	.13 [.05, .20]	2.65, $p = .008$
8. Benevolent sexism (Range: 1-6)	2.69	0.96	.27 [.19, .35]	.13 [.04, .21]	2.34, $p = .019$
9. Hostile sexism (Range: 1-6)	2.36	1.08	.31 [.23, .39]	.15 [.07, .23]	2.74, $p = .006$

Note. All correlations significant at $p < .003$.

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attitude variable (see Table 4). Using this approach, stronger implicit and explicit preferences for cisgender over transgender should be associated with lower policy support, less relationship interest, less contact, more misconceptions, less positive beliefs and attitudes towards transgender people, greater gender essentialism, and increased hostile and benevolent sexism. In all analyses, explicit transgender attitudes were reliably associated with the outcome measure (all $|\beta|$'s $> .29$, all t 's > 6.62 , all p 's $< .001$, see online supplement). In comparison, the image IAT reliably predicted all and the text IAT reliably predicted two of the eight outcomes, using a strict $p < .05$ cutoff.

These linear regressions are helpful in drawing comparisons to prior work, but this analysis strategy can increase false positives for claims of incremental predictive validity by not accounting for measurement (un)reliability (Westfall & Yarkoni, 2016). As a result, we also tested for incremental predictive validity using an analysis strategy that accounts for measurement reliability: structural equation modeling.

For each outcome and IAT, we fit a set of nested structural equation models, in which a latent implicit attitude factor and a latent explicit attitude factor predicted the manifest outcome variable. Each latent variable was identified by fixing the path to its first element at 1, and the implicit and explicit latent factors were allowed to freely covary. See Figure 1 for a schematic path diagram. Evidence of incremental predictive validity was present if removing the direct path between the implicit latent variable and the outcome measure significantly reduced model fit.

In the image IAT, we found evidence for incremental predictive validity of the implicit construct for five of eight outcomes, compared to one of eight outcomes for the text IAT.

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Table 4
Coefficients and Test Statistics for Linear Regression Analyses in Study 3a

Outcome	Image IAT β	t	p	Text IAT β	t	p
1. Policy support	-.09	-2.51	.013	-.07	-1.84	.067
2. Relationship interest	-.21	-5.36	<.001	-.12	-3.02	.003
3. Transgender contact	-.20	-5.17	<.001	-.08	-1.86	.065
4. Attitude and Belief Scale	-.10	-2.88	.004	-.09	-2.52	.012
5. Transgender misconceptions	.09	2.26	.024	.02	0.49	.628
6. Gender essentialism	.09	2.26	.024	-.04	-0.96	.339
7. Benevolent sexism	.18	4.18	<.001	-.01	-0.12	.903
8. Hostile sexism	.16	4.01	<.001	-.03	-0.61	.540

All significant SEM path coefficients were in the same direction as the regression analyses. See Table 5 for model output.

Tests of Construct Independence

The consistent incremental predictive validity of the IAT, particularly the image IAT, is suggestive evidence that these measures assess different types of attitudes than the explicit attitude items - but this assumption can also be tested directly. To assess whether implicit and explicit transgender attitudes are separable constructs, we examined the relationship between the implicit and explicit latent factors (e.g. Nosek & Smyth, 2007) separately for each IAT.

We fit three nested structural equation models (see Figure 2 for path diagrams), and found that a model allowing implicit and explicit transgender attitudes to be distinct but related constructs fit the data better than a model which fixed them to one unitary construct (Image IAT: $X^2(1) = 2,866.85$, $p < .001$, Text IAT: $X^2(1) = 2,297.80$, $p < .001$), or a model which fixed them to be two

Figure 1. Schematic path diagram for the structural equation models assessing incremental predictive validity in Study 3a. Means for all manifest variables were estimated (not shown here).

Table 5
Coefficients and Test Statistics for SEM Analyses in Study 3a

								Model	Comparison
Outcome		AIC	CFI	TLI	RMSEA	Explicit β	Implicit β	Δ -2LL	p
1. Policy support									
	Image IAT								
	Full Model	16,434.00	.995	.992	.029	−0.89 [−1.02, −0.76]	−0.28 [−0.57, 0.02]	--	--
	Explicit-Only Model	16,435.38	.995	.992	.029	−0.95 [−1.06, −0.83]	--	3.38	.066
	Text IAT								
	Full Model	17,196.01	.995	.992	.027	−0.89 [−1.01, −0.77]	−0.18 [−0.45, 0.10]	--	--
	Explicit-Only Model	17,195.58	.995	.992	.027	−0.93 [−1.03, −0.83]	--	1.57	.210
2. Relationship interest									
	Image IAT								
	Full Model	16,947.77	.994	.991	.031	−1.01 [−1.21, −0.82]	−1.06 [−1.52, −0.60]	--	--
	Explicit-Only Model	16,965.85	.992	.988	.035	−1.22 [−1.40, −1.04]	--	20.07	< .001***
	Text IAT								
	Full Model	17,854.64	.995	.992	.027	−1.00 [−1.19, −0.81]	−0.54 [−0.99, −0.09]	--	--
	Explicit-Only Model	17,858.18	.994	.992	.028	−1.10 [−1.27, −0.94]	--	5.55	.019*
3. Transgender contact									
	Image IAT								
	Full Model	16,648.49	.994	.991	.032	−0.42 [−0.54, −0.31]	−0.68 [−0.97, −0.40]	--	--
	Explicit-Only Model	16,668.87	.991	.987	.037	−0.55 [−0.66, −0.44]	--	22.38	< .001***
	Text IAT								
	Full Model	17,429.33	.997	.995	.022	−0.54 [−0.66, −0.43]	−0.20 [−0.51, 0.11]	--	--
	Explicit-Only Model	17,428.91	.997	.995	.022	−0.58 [−0.69, −0.48]	--	1.58	.209
4. Attitude and Belief Scale									
	Image IAT								
	Full Model	15,846.60	.993	.989	.035	−0.58 [−0.65, −0.51]	−0.19 [−0.36, −0.02]	--	--
	Explicit-Only Model	15,849.61	.993	.989	.035	−0.61 [−0.68, −0.56]	--	5.01	.025*
	Text IAT								
	Full Model	16,557.07	.994	.990	.031	−0.64 [−0.70, −0.57]	−0.06 [−0.22, 0.09]	--	--
	Explicit-Only Model	16,555.74	.994	.991	.030	−0.65 [−0.71, −0.59]	--	0.67	.414
5. Transgender misconceptions									
	Image IAT								
	Full Model	16,296.90	.995	.992	.029	0.75 [0.63, 0.88]	0.09 [−0.15, 0.33]	--	--
	Explicit-Only Model	16,295.41	.995	.993	.028	0.78 [0.67, 0.88]	--	0.51	.476
	Text IAT								
	Full Model	16,997.31	.997	.995	.022	0.82 [0.73, 0.91]	−0.07 [−0.29, 0.15]	--	--
	Explicit-Only Model	16,995.67	.997	.995	.021	0.81 [0.73, 0.89]	--	0.36	.549
6. Gender essentialism									
	Image IAT								

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	Full Model	16,664.31	.994	.991	.032	0.74 [0.61, 0.87]	0.29 [-0.03, 0.61]	--	--
	Explicit-Only Model	16,665.57	.994	.991	.032	0.80 [0.69, 0.92]	--	3.25	.071
	Text IAT								
	Full Model	17,503.86	.995	.992	.027	0.85 [0.72, 0.98]	-0.21 [-0.52, 0.10]	--	--
7. Benevolent sexism	Explicit-Only Model	17,503.67	.995	.992	.027	0.82 [0.70, 0.93]	--	1.80	.179
	Image IAT								
	Full Model	16,363.94	.995	.992	.030	0.30 [0.20, 0.41]	0.52 [0.25, 0.79]	--	--
	Explicit-Only Model	16,376.07	.993	.990	.033	0.39 [0.30, 0.49]	--	14.13	< .001***
	Text IAT								
	Full Model	17,176.96	.995	.992	.027	0.41 [0.29, 0.52]	0.02 [-0.25, 0.30]	--	--
	Explicit-Only Model	17,174.99	.995	.993	.026	0.41 [0.31, 0.51]	--	0.03	.868
8. Hostile sexism	Image IAT								
	Full Model	16,392.42	.995	.993	.028	0.59 [0.49, 0.70]	0.50 [0.22, 0.77]	--	--
	Explicit-Only Model	16,403.10	.994	.991	.031	0.68 [0.58, 0.77]	--	12.69	< .001***
	Text IAT								
	Full Model	17,246.60	.996	.994	.024	0.62 [0.50, 0.74]	-0.08 [-0.37, 0.21]	--	--
	Explicit-Only Model	17,244.89	.996	.994	.023	0.60 [0.50, 0.71]	--	0.29	.590

Note. AIC = Akaike Information Criterion; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; -2LL = -2 Log Likelihood. All *p*-values based on tests with 1 df. Values in brackets are 95% confidence intervals.

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separate constructs (Image IAT: $X^2(1) = 348.26, p < .001$, Text IAT: $X^2(1) = 326.44, p < .001$).

See Table 6 for model fit statistics.

Discussion

Cisgender and transgender participants showed ingroup favoritism in implicit transgender attitudes. SEM analyses of the image IAT revealed incremental predictive validity for five of the eight outcome measures, meaning the image IAT explained variance in outcomes like relationship interest beyond the measure of explicit attitudes. The Image IAT had higher internal reliability and produced stronger mean-level effects among cisgender participants. The Image IAT was also more strongly correlated with a number of related outcomes, such as hostile sexism and gender essentialism.

To provide better estimates of the incremental predictive validity of the image IAT, we ran an additional study using the same outcome measures and meta-analyzed the results of Studies 3a-3b.

Study 3b

Method

Participants

2185 Project Implicit volunteers ($M_{\text{Age}} = 32.4, SD = 13.0$; 72.7% White; 60.4% female; 69.6% US citizens) provided eligible IAT data. The study was again the site's "featured task." The final sample provided more than 99% power for detecting the smallest correlation between implicit transgender attitudes and any outcome measure found in Study 3a.

Measures and Procedure

Participants completed the same measures as Study 3a using the same procedure, with the only change being all participants completed the Image IAT. For sexual orientation, 72.7% of the

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Figure 2. Path diagrams for the structural equation models testing construct independence in Study 3a. Means for all manifest variables were estimated (not shown here). All coefficients represent standardized paths.

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Table 6

Model Fit Statistics for SEM Measurement Models in Study 3a

							Comp	w/Related
Model		AIC	CFI	TLI	RMSEA	df	Δ -2LL	p
Related Constructs								
	Image	16,056.42	.994	.991	.034	17,989	52,034.42	-
	Text	16,828.07	.996	.993	.027	18,982	54,792.07	-
Unrelated Constructs								
	Image	18,921.26	.64	.47	.28	17,990	54,901.26	2,866.85
	Text	19,123.87	.68	.53	.24	18,983	57,089.87	2,297.80
Identical Constructs								
	Image	16,402.67	.95	.93	.11	17,990	52,382.67	348.26
	Text	17,152.51	.95	.93	.093	18,983	55,118.51	326.44

Note. AIC = Akaike Information Criterion; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; -2LL = -2 Log Likelihood. All p -values based on tests with 1 df.

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sample identified as heterosexual or straight, 8.7% as lesbian or gay, 9.6% as bisexual, 5.4% as queer and 3.6% as having another sexual orientation. For gender, 88.6% of the sample was classified as cisgender, and 2.7% as transgender.

Results

Comparing Cisgender and Transgender Participants

Results replicated findings of Study 3a. Transgender ($N = 60$) and cisgender ($N = 1918$) participants showed ingroup favoritism in implicit and explicit attitudes (all t 's > 3.28 , all p 's $< .003$, all d 's $> .41$; see online supplement for individual tests).

Correlations Between Transgender Attitudes and Outcome Measures

IAT D scores and the explicit preference variable reliably correlated with all outcome measures in the expected direction (all $|r|$'s $> .291$, all p 's $< .001$; see online supplement).

Predictive validity of the Transgender IAT

Using a least squares linear regression analysis, implicit and explicit transgender attitudes independently predicted all eight outcomes measures (all $|\beta|$'s $> .11$, all t 's > 2.40 , all p 's $< .017$; see online supplement).

Similarly, structural equation modeling analyses found evidence for incremental predictive validity of the implicit construct for all eight outcomes (all X^2 's > 4.41 , all p 's $< .036$). All SEM path coefficients were in the same direction as in the regression analyses. See Table 7.

SEM Meta-Analysis of Incremental Predictive Validity

Given the conflicting results of the SEM analyses for the image IAT in Studies 3a and 3b, we ran an additional set of models that aggregated across samples. For each outcome measure, we set up a structural equation model containing two subgroups, one for Study 3a and one for Study 3b, that matched the full models of their respective studies. In our base model, we allowed

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Table 7
Coefficients and Test Statistics for SEM Analyses in Study 3b

Outcome		AIC	CFI	TLI	RMSEA	Explicit β	Implicit β	Model Δ -2LL	Comparison p
1. Policy support									
	Full Model	14,196.97	.996	.993	.027	-0.79 [-0.93, -0.65]	-0.79 [-1.11, -0.48]	--	--
	Explicit-Only Model	14,218.32	.992	.989	.035	-0.95 [-1.08, -0.82]	--	23.35	< .001
2. Relationship interest									
	Full Model	14,690.12	.996	.993	.027	-0.88 [-1.06, -0.70]	-1.34 [-1.82, -0.86]	--	--
	Explicit-Only Model	14,717.62	.991	.987	.037	-1.11 [-1.28, -0.95]	--	29.50	< .001
3. Transgender contact									
	Full Model	14,344.35	.994	.990	.032	-0.53 [-0.66, -0.39]	-0.34 [-0.67, -0.02]	--	--
	Explicit-Only Model	14,346.77	.993	.990	.033	-0.60 [-0.71, -0.48]	--	4.41	.036
4. Attitude and Belief Scale									
	Full Model	13,635.67	.993	.990	.033	-0.63 [-0.70, -0.55]	-0.25 [-0.41, -0.09]	--	--
	Explicit-Only Model	13,642.60	.992	.989	.035	-0.68 [-0.74, -0.61]	--	8.93	.003
5. Transgender misconceptions									
	Full Model	14,066.29	.996	.993	.027	0.69 [0.56, 0.81]	0.32 [0.03, 0.60]	--	--
	Explicit-Only Model	14,068.98	.995	.993	.028	0.75 [0.65, 0.86]	--	4.69	.030
6. Gender essentialism									
	Full Model	14,387.51	.994	.990	.033	0.86 [0.70, 1.02]	0.59 [0.23, 0.95]	--	--
	Explicit-Only Model	14,395.57	.992	.989	.035	0.98 [0.83, 1.12]	--	10.06	.002
7. Benevolent sexism									
	Full Model	14,072.87	.995	.992	.029	0.31 [0.19, 0.43]	0.52 [0.21, 0.84]	--	--
	Explicit-Only Model	14,081.34	.994	.991	.032	0.41 [0.30, 0.52]	--	10.47	.001
8. Hostile sexism									
	Full Model	14,135.42	.994	.991	.030	0.58 [0.45, 0.71]	0.42 [0.08, 0.76]	--	--
	Explicit-Only Model	14,139.18	.994	.991	.031	0.66 [0.55, 0.78]	--	5.77	.016

Note. AIC = Akaike Information Criterion; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; -2LL = -2 Log Likelihood. All p -values based on tests with 1 df. Values in brackets are 95% confidence intervals.

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all parameters to freely vary across both subgroups. In our meta-analytic models, we constrained the loadings on the latent constructs, the covariance between the latent constructs, and the pathways between the latent constructs and the outcome measure to be equal across the two subgroups, while still allowing for variation in the manifest variables.

We found that these constraints led to no significant loss of fit across any of the eight outcomes, indicating that the structures and relations across the two samples are similar enough for our meta-analytic approach to provide interpretable parameters (see Table 8). To test for meta-analytic incremental predictive validity, we then further constrained each meta-analytic model by removing the pathway from the implicit latent construct to the outcome measure and testing for a loss in model fit, as in Studies 3a and 3b. Using this approach, we found meta-analytic evidence for the incremental predictive validity of the IAT for seven of the eight outcomes, with marginal evidence ($p = .051$) for the eighth, Transgender Misconceptions. See Table 9 for meta-analytic coefficients.

General Discussion

Two measures of implicit transgender attitudes revealed that implicit and explicit transgender attitudes reflect distinct but related constructs. Both explicit and implicit attitude measures showed robust preferences for cisgender (over transgender) people, the strength of which were moderated by sexual orientation and gender identity. Even after accounting for explicit transgender attitudes, implicit transgender attitudes predicted meaningful outcomes, including transphobia, public policy support, interest in romantic relationships, prior contact, and general gender-related beliefs like sexism and gender essentialism.

These findings emphasize the importance of implicit assessments of transgender attitudes; implicit measures provide information that people may not be willing (or able) to self-

Table 8
Fit and Test Statistics for SEM Meta-Analytic Models, Studies 3a & 3b

					Model	Comparison	
Outcome		AIC	CFI	TLI	RMSEA	Δ -2LL	p
1. Policy support							
	Free Model	30,630.97	.995	.993	.020	--	--
	Meta-Analytic Model	30,621.53	.995	.994	.018	6.57	.584
2. Relationship interest							
	Free Model	31,637.90	.995	.992	.021	--	--
	Meta-Analytic Model	31,624.13	.995	.994	.018	2.23	.973
3. Transgender contact							
	Free Model	30,992.84	.994	.990	.023	--	--
	Meta-Analytic Model	30,980.93	.994	.992	.020	4.08	.850
4. Attitude and Belief Scale							
	Free Model	29,482.27	.993	.990	.024	--	--
	Meta-Analytic Model	29,469.26	.994	.992	.021	3.00	.935
5. Transgender misconceptions							
	Free Model	30,363.19	.995	.993	.020	--	--
	Meta-Analytic Model	30,350.11	.996	.994	.017	2.92	.940
6. Gender essentialism							
	Free Model	31,051.83	.994	.990	.023	--	--
	Meta-Analytic Model	31,041.94	.994	.992	.020	6.11	.635
7. Benevolent sexism							
	Free Model	30,436.81	.995	.992	.021	--	--
	Meta-Analytic Model	30,421.87	.995	.994	.018	1.07	.998
8. Hostile sexism							
	Free Model	30,527.83	.995	.992	.020	--	--
	Meta-Analytic Model	30,513.39	.995	.994	.018	1.55	.992

Note. AIC = Akaike Information Criterion; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; -2LL = -2 Log Likelihood. All p -values based on tests with 8 df. Values in brackets are 95% confidence intervals.

Table 9
Coefficients and Test Statistics for Meta-Analytic SEM Analyses, Studies 3a & 3b

Outcome		AIC	CFI	TLI	RMSEA	Explicit β	Implicit β	Model Δ -2LL	Comparison p
1. Policy support									
	Full Model	30,621.53	.995	.994	.018	-0.84 [-0.94, -0.75]	-0.52 [-0.74, -0.30]	--	--
	Explicit-Only Model	30,640.81	.994	.993	.020	-0.95 [-1.03, -0.86]	--	21.28	< .001
2. Relationship interest									
	Full Model	31,624.13	.995	.994	.018	-0.94 [-1.07, -0.81]	-1.20 [-1.53, -0.86]	--	--
	Explicit-Only Model	31,671.27	.992	.990	.023	-1.16 [-1.29, -1.04]	--	49.14	< .001
3. Transgender contact									
	Full Model	30,980.93	.994	.992	.020	-0.47 [-0.55, -0.38]	-0.54 [-0.75, -0.33]	--	--
	Explicit-Only Model	31,003.44	.993	.991	.022	-0.57 [-0.65, -0.49]	--	24.51	< .001
4. Attitude and Belief Scale									
	Full Model	29,469.26	.994	.992	.021	-0.60 [-0.65, -0.55]	-0.22 [-0.34, -0.11]	--	--
	Explicit-Only Model	29,481.22	.993	.991	.022	-0.64 [-0.69, -0.60]	--	13.95	< .001
5. Transgender misconceptions									
	Full Model	30,350.11	.996	.994	.017	0.72 [0.64, 0.81]	0.18 [-0.00, 0.37]	--	--
	Explicit-Only Model	30,351.92	.995	.994	.017	0.76 [0.69, 0.84]	--	3.81	.051
6. Gender essentialism									
	Full Model	31,041.94	.994	.992	.020	0.79 [0.68, 0.89]	0.41 [0.17, 0.65]	--	--
	Explicit-Only Model	31,051.36	.993	.992	.021	0.87 [0.78, 0.96]	--	11.43	.001
7. Benevolent sexism									
	Full Model	30,421.87	.995	.994	.018	0.31 [0.23, 0.38]	0.52 [0.32, 0.73]	--	--
	Explicit-Only Model	30,444.45	.994	.992	.020	0.40 [0.33, 0.47]	--	24.58	< .001
8. Hostile sexism									
	Full Model	30,513.39	.995	.994	.018	0.59 [0.50, 0.67]	0.46 [0.25, 0.68]	--	--
	Explicit-Only Model	30,529.56	.994	.993	.020	0.67 [0.60, 0.75]	--	18.18	< .001

Note. AIC = Akaike Information Criterion; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; -2LL = -2 Log Likelihood. All p -values based on tests with 1 df. Values in brackets are 95% confidence interval.

report. At the same time, our models suggest that explicit attitudes are more strongly related to these outcomes (meta-analytic median absolute B from Studies 3a & 3b for explicit attitudes = 0.66, for implicit attitudes = 0.49). However, this relationship may be complicated by response modality: as participants self-reported both explicit attitudes and our criterion measures, these outcomes share method variance, which may then inflate the observed relationship between them (see Buttrick, Axt, et al, 2020 for further discussion).

Superiority of the image-based IAT

In Studies 1-3a, participants completed either an image or text version of the IAT. Though both measures showed evidence of validity for assessing implicit transgender attitudes, we consistently found superior validity for the image IAT. The image IAT exhibited greater internal reliability, higher mean-level effects of anti-transgender attitudes, stronger correlations with many related outcomes, and maximized differences in attitudes between straight versus gay or lesbian participants (though not between cisgender and transgender participants). In total, there was not a single metric where the text IAT outperformed the image IAT.

For these reasons, we believe that future researchers should adopt the image IAT when assessing implicit transgender attitudes. However, these data cannot explain *why* the image IAT showed superior validity. There are several plausible explanations. For example, using images of well-known celebrities could have better clarified the concepts of cisgender and transgender people. Similarly, people may rely on these prominent transgender figures when forming their attitudes about transgender people, and the respect or warmth that some participants felt towards these celebrities may better capture their attitudes towards transgender people in general. Alternatively, the text IAT could have suffered from a lack of variability in stimuli (an issue that does not appear to be easily remedied), or less activation of the underlying associations

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themselves. That is, while the image IAT may have required deeper cognitive processing to classify celebrity stimuli into their gender categories, the text IAT may have enabled more superficial semantic feature matching (i.e., all stimuli for the “transgender” category start with the prefix “trans-”; all stimuli for the “cisgender” category start with the prefix “cis-”). The image IAT’s superior performance could even simply be a result of the extra training block included to familiarize participants with the celebrity stimuli. Disentangling these explanations could be a focus of future research, but the present evidence is clear on the superiority of the image IAT for assessing the global construct of implicit transgender attitudes.

In addition, the online supplement details two additional studies that further support the image IAT’s validity. Study S1 ($N = 720$) again demonstrated known-groups validity, with heterosexual participants exhibiting more negative implicit transgender associations than gay and lesbian participants ($d = .46, p = .008$), as well as reliable correlations between the IAT and explicit transphobia ($r = .32, p < .001$) and support for transgender-related policies ($r = -.19, p < .001$). Study S2 ($N = 415$) also used a sample of participants reporting no explicit preference for transgender versus cisgender people and found that the image IAT predicted self-reported transphobia ($r = .26, p < .001$) and support for transgender-related policies ($r = -.16, p = .002$).

One concern with the image IAT is its possible dependence on participants’ familiarity with the transgender celebrities used as stimuli, despite past research suggesting IAT category labels are far more important than the specific stimuli (Dasgupta & Greenwald, 2001). To investigate this issue, a subset of participants ($N = 1175$) in Study 3a rated their familiarity with all of the transgender and cisgender celebrities used as stimuli (1= “Not at all”, 4= “Extremely”). Participants who were not familiar with any of the transgender celebrities exhibited acceptable levels of reliability on the IAT ($\alpha = .80$) relative to participants who reported being at least “a

little” familiar with each transgender celebrity ($\alpha = .82$). Even participants unfamiliar with the stimuli still showed higher levels of internal reliability on the image IAT than the text IAT ($\alpha = .66$). While stimuli familiarity may be helpful, it does not appear to be a requirement to achieve satisfactory measurement.

However, one weakness of this research is the exclusive use of volunteer samples from Project Implicit. Visitors to Project Implicit are likely to be more intrinsically interested in the topics of implicit attitudes and intergroup bias. It is possible that samples from different sources or more representative samples would fail to show the effects observed here. Exploring this question in future uses of these measures will be informative, though we cannot identify a plausible reason to expect this lack of generalizability.

Another possible limitation is that we did not restrict analyses to U.S. citizens. Including citizens of multiple countries could have introduced differing levels of familiarity or knowledge about transgender issues among our sample, which in turn may have impacted results. Across Studies 1-3b, 83.4% of participants came from four countries (United States = 70.0%, United Kingdom = 6.3%, Canada = 4.7%, Australia = 2.4%). In the online supplement, we report analyses investigating whether U.S. citizenship moderated 1) the relative difference between *D* scores on the image versus text IAT and 2) the strength of the relationship between *D* scores and any of our self-reported outcome variables. Using a $p < .05$ threshold, none of the 39 analyses found reliable differences between U.S. citizens and non-U.S. citizens. That said, future studies collecting more nationally diverse samples will increase the generalizability of these results.

Implicit transgender attitudes independently predict meaningful beliefs and experiences

Using simultaneous linear regression and SEM analyses, we found evidence for incremental predictive validity of the Transgender IAT above and beyond self-reported explicit

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preferences. People with stronger implicit preferences for cisgender over transgender people reported greater transphobia, had less experience with (and were less willing to consider) romantic relationships with a transgender person, and had more infrequent contact with (or knew) fewer transgender people. This last finding is notable in that evidence for the contact hypothesis in the existing literature on transgender attitudes has been mixed (Flores, 2015).

Implicit transgender attitudes were also related to more general gender-based beliefs. People with stronger implicit preferences for cisgender (over transgender) people reported higher rates of hostile and benevolent sexism, consistent with a pattern of ambivalent sexism in which subjectively positive (but stereotyped and restrictive) feelings towards women co-exist with sexist antipathy or prejudice (Glick & Fiske, 1996). This result replicates previous work showing that ambivalent sexism is associated with explicit transgender attitudes (Nagoshi et al., 2008), and extends the finding to implicit attitudes.

Studies 3a-3b are noteworthy because they present one of the first uses of SEM to show evidence for the incremental predictive validity of implicit attitudes. The few existing tests of incremental predictive validity of implicit associations using SEM have produced positive (Axt, Bar-Anan, & Vianello, 2019), negative (Brick & Lai, 2018), and mixed (Buttrick, Axt, Ebersole & Huband, in press) results. The present work expands this literature by providing evidence for the incremental predictive validity of implicit attitudes for a number of outcomes.

However, while this work shows implicit transgender attitudes predict relevant outcomes, they provide no evidence that implicit attitudes are *causally* related to such outcomes. Indeed, evidence that changes in implicit attitudes are associated with changes in relevant behavior is inconclusive (Forscher, Lai et al. 2019). Thus, having established these correlational relationships, it is critical that subsequent work test whether implicit transgender attitudes have a

causal effect. Manipulations targeting implicit associations may be an avenue for interventions seeking to change beliefs about transgender people, complementing existing interventions that target propositional knowledge (e.g., Broockman & Kalla, 2016).

Implicit Favoritism Among Transgender Participants

A strength of the present research is its large sample sizes and inclusion of transgender participants. To our knowledge, this work presents the first estimate of general implicit transgender attitudes (i.e., towards “transgender people” as the focal category) among transgender participants. One intriguing result is that transgender participants completing the image IAT ($N = 101$ across Studies 3a-3b) showed implicit ingroup favoritism ($d = .42$) at levels nearly identical to their cisgender counterparts ($d = .44$). These results are striking because they contrast starkly with a lack of implicit ingroup favoritism on the IAT found in other minority populations, such as in race (e.g., Nosek et al., 2007) and religion (Rudman et al., 2002). A related exception comes from sexual orientation, which has shown consistent implicit ingroup favoritism in lesbian- and gay-identified populations (Westgate, Riskind & Nosek, 2015).

More notably, these results differ from previous work assessing implicit transgender attitudes. In Wang-Jones et al., (2017), participants classified as transgender ($N = 42$) showed no ingroup favoritism on IATs measuring associations towards “transsexual men” (vs “biological men”) or “transsexual women” (vs. “biological women”). One potential explanation may come from differing methods for classifying transgender participants. In Wang-Jones et al. (2017), 32 of 42 participants in the subsample identified as “agender, gender-fluid, gender-queer, non-binary”; in other words, only 10 participants labeled themselves as transgender when given the option. The more stringent classification method used here may present a more accurate depiction of the implicit ingroup favoritism of transgender people. Further exploring the causes

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behind this ingroup favoritism should be a focus of future work, in addition to studies that directly compare the predictive validity and level of ingroup favoritism produced by this image IAT and the measure used in Wang-Jones et al., (2017).

Transgender Attitudes and Gender Essentialism

These findings also demonstrate a positive correlation between anti-transgender attitudes and gender essentialism. Here, essentialism assessed the belief that there are fundamental differences between genders, and that these differences should dictate the roles or opportunities available to each gender (e.g., Smiler & Gelman, 2008). Previous work has found that endorsement of the gender binary – a component of gender essentialism – is related to more negative explicit attitudes towards transgender people (Norton & Herek, 2013), but this is the first empirical evidence for a relationship between the broader construct of gender *essentialism* and attitudes towards transgender people. Although this may seem unsurprising, it contrasts with related work finding that essentialist beliefs about sexual orientation predict more *positive* attitudes towards lesbian and gay people (Roberts et al., 2017). One possible explanation is that transgender people may challenge rigid gender conceptions differently than lesbian or gay people (Ching & Xu, 2018).

However, it is also possible that “gender essentialism” – like essentialist beliefs about sexual orientation - could be construed in a manner that would predict more favorable attitudes towards transgender people. Endorsing gender essentialism as the belief that individuals are born with an “essential” gender identity (or lack thereof) that need not align with sex assigned at birth would likely correlate with more positive transgender attitudes. For example, belief that transgender identity itself has a biological basis has been associated with more positive attitudes towards transgender people (Landen & Innala, 2000). Similarly, in Study 3a, greater agreement

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with the item “Whether a person is male or female depends upon whether they feel male or female” was associated with less negative transgender attitudes, both implicitly (Image IAT $r = -.28, p < .001$) and explicitly ($r = -.54, p < .001$). Subsequent research on this topic will benefit from understanding how different forms of gender essentialist beliefs relate to attitudes and behaviors concerning transgender people.

Available Resources and Future Uses

We hope researchers will find the transgender IAT useful in studying implicit transgender attitudes. To aid in that goal, we have made all data and materials available, and have programmed an Inquisit version of the image transgender IAT. These resources can be accessed at <https://osf.io/rcgdx/>.

We anticipate that this measure of implicit transgender attitudes will assist researchers in understanding how such attitudes relate to other beliefs or behaviors concerning transgender people, as well as how implicit transgender attitudes change over time. Given evidence of changes in implicit attitudes towards gay people (Westgate et al., 2015), similar changes in implicit attitudes towards transgender people may occur in the coming years. The IAT introduced here could also be useful to researchers and the public in raising awareness of transphobia. While the transgender community has been historically under-researched and under-represented in psychological literature, that is changing (Tompkins et al., 2015). Future research may contribute to greater awareness in addressing how implicit and explicit attitudes impact the daily lives of transgender people.

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Appendix A

Transgender and cisgender celebrities used as stimuli in the image-based transgender IAT.

Category	Items
Cisgender celebrities
Transgender celebrities

Background information provided for transgender celebrity stimuli.

In this categorization task, you will sort images of both transgender and cisgender people. These are images of real people, some of whom you may know. To further familiarize yourself with these images, we provided a short description of each. This page contains the transgender images and the next page contains the cisgender images.

"Cisgender" refers to people who feel there is a match between the sex they were assigned at birth and the gender they feel themselves to be. "Transgender" refers to people who feel there is a mismatch between the sex they were assigned at birth and the gender they feel themselves to be.

Transgender Person	Name and Description
Chaz Bono is a musician and actor.
Chris Mosier is a triathlete.
Laverne Cox is an actress.
Caitlyn Jenner is a television personality.

Press the button below to learn about the cisgender images.

Continue

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Background information provided for transgender celebrity stimuli.

This page contains more information about the cisgender images.

Cisgender Person	Name and Description
Jon Favreau is an actor and director.
Tyler Clary is a swimmer.
Meagan Good is an actress.
Meryl Streep is an actress.

Appendix B

Transgender policy-related items used in Studies 1-2, Study S1.

All responses made on a 1=Strongly Disagree to 7=Strongly Agree scale. All items presented in a randomized order. Aggregate score calculated by averaging all responses.

1. Transgender people should be able to use the bathroom of the gender they most closely identify with.
2. Transgender people should be able to easily obtain new official documents (driver's license, passports, etc.) after deciding to transition.
3. Transgender people working in offices with dress codes should be able to dress as the gender they most closely identify with.
4. Transgender people should be able to adopt children.
5. Health insurance should cover services needed by transgender people (hormones, surgery, etc.).

Appendix C

Outcome variables used in Studies 3a-3b.

Policy Support

All responses made on a 1=Strongly Disagree to 7=Strongly Agree scale. Presentation of prompts was randomized, but order of items within prompts was fixed. Aggregate score calculated by averaging all responses. R = Reverse-scored item.

Prompt 2: North Carolina's General Assembly recently passed a law that directed all public schools, college campuses, and government agencies to require that every multiple-occupancy bathroom or changing facility (e.g., school restroom, locker room, changing room, or shower room) be used only by people based on their biological sex (i.e., the physical condition of being male or female, which is stated on a person's birth certificate). This law requires that transgender people use the bathroom that corresponds to the gender on their birth certificate.

Prompt 1, Item 1: I support this law. *R*

Prompt 1, Item 2: Every state should adopt a law like this. *R*

Prompt 1, Item 3: It is wrong for people to use a bathroom that doesn't correspond with their biological sex. *R*

Prompt 1, Item 4: Transgender people should be allowed to use any bathroom they feel comfortable with.

Prompt 2: The University of North Carolina's LGBTQ Task Force supports, provides, and fully funds counseling services that help transgender people understand their gender-related experiences and feel secure in their gender identity.

Prompt 2, Item 1: I support the mission of this Task Force.

Prompt 2, Item 2: Every university should have a Task Force like this.

Prompt 2, Item 3: It is wrong for university counselors to provide services that help transgender people. *R*

Prompt 2, Item 4: Government agencies should fund counseling services that promote the transgender community.

Prompt 3: The United States Department of Defense (DoD) recently announced a new policy stating that transgender people are allowed to serve openly in the United States military, and cannot be discharged solely for identifying as transgender. Current military personnel may transition to their preferred gender with the support of a military medical provider. After transitioning, military personnel must use berthing, bathroom, and shower facilities that correspond with their preferred gender, and meet their preferred gender's physical fitness standards for the military.

Prompt 3, Item 1: It is wrong for transgender people to serve in the military. *R*

Prompt 3, Item 2: I support this policy.

Prompt 3, Item 3: Every country's military should have a policy like this.

Prompt 3, Item 4: Transgender people should be allowed to serve in the military as their preferred gender.

Prompt 4: Illinois recently banned 'trans panic' as a legal defense in assault, manslaughter, and murder cases. Under the old law, defendants could argue that they engaged in sexual relations while unaware of the victim's gender identity, and that this later discovery induced a state of temporary insanity that made them legally not accountable for their actions. Under the new ban, defendants are no longer allowed to use the discovery of a sexual partner's undisclosed gender identity as a legal defense.

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Prompt 4, Item 1: I support this legal ban.

Prompt 4, Item 2: Every state should ban legal defenses like this.

Prompt 4, Item 3: It is wrong for transgender people to have sexual relations without disclosing their gender identity. *R*

Prompt 4, Item 4: People should be allowed to use the discovery of a sexual partner's undisclosed gender identity as a legal defense for assault, manslaughter, or murder. *R*

Transgender Relationship Interest

All responses made on a 0=No, 1= Yes scale. Items were presented in a randomized order.

Aggregate score calculated by summing all five responses.

1. I am currently dating, or have dated a transgender person in the past.
2. I would be open to a romantic relationship with a transgender person.
3. I would go on a date with a transgender person.
4. I would be willing to engage in a sexual act with a transgender person.
5. I would be willing to marry a transgender person.

Transgender Contact

All responses made on a 0=No, 1= Yes scale. Items were presented in a randomized order.

Aggregate score calculated by summing all four responses.

1. Do you have a family member who is transgender?
2. Do you have a friend who is transgender?
3. Do you have friendly interactions with transgender people on a regular basis?
4. Have you ever met a transgender person?

Transgender Attitude and Belief Scale (TABS; Kanamori et al., 2017)

All responses made on a 1=Strongly Disagree to 5=Strongly Agree scale. Items were presented in a randomized order. Aggregate score calculated by averaging all responses. R = Reverse-scored item.

1. I would feel comfortable if my next-door neighbor was transgender.
2. I would find it highly objectionable to see a transgender person being teased or mistreated.
3. Whether a person is male or female depends strictly on their external sex-parts. *R*
4. Although most of humanity is male or female, there are also identities in between.
5. I would be comfortable being in a group of transgender individuals.
6. A person who is not sure about being male or female is mentally ill. *R*
7. I would be upset if someone I'd known for a long time revealed that they used to be another gender. *R*
8. If I knew someone was transgender, I would tend to avoid that person. *R*
9. If I knew someone was transgender, I would still be open to forming a friendship with that person.
10. I would be comfortable working for a company that welcomes transgender individuals.
11. All adults should identify as either male or female. *R*
12. Transgender individuals are valuable human beings regardless of how I feel about transgenderism.
13. A child born with ambiguous sex-parts should be assigned to be either male or female. *R*

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14. A person does not have to be clearly male or female to be normal and healthy.
15. Humanity is only male or female; there is nothing in between. *R*
16. If a transgender person asked to be my housemate, I would want to decline. *R*
17. If you are born male, nothing you do will change that. *R*
18. I would feel comfortable having a transgender person into my home for a meal.
19. If my child brought home a transgender friend, I would be comfortable having that person into my home.
20. I would feel uncomfortable working closely with a transgender person in my workplace. *R*
21. Whether a person is male or female depends upon whether they feel male or female.
22. Transgender individuals should have the same access to housing as any other person
23. If a transgender person identifies as female, she should have the right to marry a man.
24. I would be uncomfortable if my boss was transgender. *R*
25. If someone I knew revealed to me that they were transgender, I would probably no longer be as close to that person. *R*
26. Transgender individuals should be treated with the same respect and dignity as any other person.
27. Transgender individuals are human beings with their own struggles, just like the rest of us.
28. I would feel uncomfortable finding out that I was alone with a transgender person. *R*
29. If I found out my doctor was transgender, I would want to seek another doctor. *R*

Transgender Misconceptions

All responses made on a 1=Strongly Disagree to 5=Strongly Agree scale. Items were presented in a randomized order. Aggregate score calculated by averaging all responses.

1. Transgender people are trying to trick others.
2. Transgender people are trying to hide their gender from others for personal gain.
3. Transgender people are confused about their sexuality.
4. Transgender people are secretly lesbian, gay, or bisexual.
5. Transgender people are trapped in the wrong body.
6. All transgender people must medically transition through hormone therapy or surgery.
7. Transgender people are confused about gender.
8. Transgender people who identify as male or female are not “real” men or women.
9. Sex-reassignment surgery is what makes a person transgender.
10. Wanting to wear clothes typical of the opposite sex makes a person transgender.
11. Cross-dressers are transgender.
12. Drag queens (and drag kings) are transgender.
13. Transgender people are mentally ill.
14. Transgender people can be “fixed” through therapy.
15. Transgender people are unstable or flaky.
16. Transgender people have weak morals.
17. Transgender people are a danger to children.
18. Transgender people are hypersexual.
19. Most transgender people are sex workers.

20. Most transgender people are HIV+.

Gender Essentialism (Hettinger, 2014)

All responses made on a 1=Strongly Disagree to 7=Strongly Agree scale. Items were presented in a randomized order. Aggregate score calculated by averaging all responses.

1. Personality differences between men and women cannot be changed, because they are caused by biological factors such as genes and hormones.
2. Just knowing whether someone is male or female can tell you a lot about that person.
3. Masculinity and femininity are mutually exclusive categories, and each person either belongs to one or the other.
4. Under the surface, people are essentially very similar to others of their own gender.
5. Masculinity and femininity are concepts that have endured in basically the same form over time and across cultures.

Ambivalent Sexism (Glick & Fiske, 1996)

All responses made on a 1=Strongly disagree to 6=Agree strongly scale. Items were presented in a randomized order. Aggregate score calculated by averaging all responses. B= Benevolent Sexism item, H= Hostile Sexism item. R = Reverse-scored item.

1. No matter how accomplished he is, a man is not truly complete as a person unless he has the love of a woman. *B*
2. Many women are actually seeking special favors, such as hiring policies that favor them over men, under the guise of asking for "equality." *H*
3. In a disaster, women ought not necessarily to be rescued before men. *B,R*
4. Most women interpret innocent remarks or acts as being sexist. *H*
5. Women are too easily offended. *H*

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6. People are often truly happy in life without being romantically involved with a member of the other sex. *B,R*
7. Feminists are not seeking for women to have more power than men. *H,R*
8. Many women have a quality of purity that few men possess. *B*
9. Women should be cherished and protected by men. *B*
10. Most women fail to appreciate fully all that men do for them. *H*
11. Women seek to gain power by getting control over men. *H*
12. Every man ought to have a woman whom he adores. *B*
13. Men are complete without women. *B,R*
14. Women exaggerate problems they have at work. *H*
15. Once a woman gets a man to commit to her, she usually tries to put him on a tight leash. *H*
16. When women lose to men in a fair competition, they typically complain about being discriminated against. *H*
17. A good woman should be set on a pedestal by her man. *B*
18. There are actually very few women who get a kick out of teasing men by seeming sexually available and then refusing male advances. *H,R*
19. Women, compared to men, tend to have a superior moral sensibility. *B*
20. Men should be willing to sacrifice their own well-being in order to provide financially for the women in their lives. *B*
21. Feminists are making entirely reasonable demands of men. *H,R*
22. Women, as compared to men, tend to have a more refined sense of culture and good taste. *B*