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Transgender Prejudice Reduction and Opinions on Transgender Rights: Results from a Mediation Analysis on Experimental Data

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Abstract

Fears, phobias, and dislikes about minorities should be strong determinants of whether Americans support policies protecting such minorities. Studies suggest that discussions and information about transgender people can reduce transphobia. However, these studies also indicate that experimental treatments do not necessarily affect individual attitudes on policies concerning transgender rights. Scholars contend that durably reducing prejudice should increase public support for minority rights. In this study, we examine this causal mechanism utilizing an experiment. We find that reducing transphobia is a reliable mechanism to increase public support for transgender rights. These results are robust to causal identification assumptions, suggesting that this mechanism provides a clear avenue for stigmatized groups to increase public support of rights for those groups.

Introduction

The emergence of the transgender rights movement has drawn political science and public opinion scholars to empirically assess public attitudes about transgender people and their rights. This growing literature in observational studies has provided many insights in regards to the impact of disgust and authoritarianism (Casey, 2015; Miller et al., 2017), interpersonal contact (Flores, 2015; Pierceson and Kirzinger, 2015; Tadlock et al., 2017), and body politics (Miller et al., 2017), on attitudes, as well as support for transgender candidates for public office (Haider-Markel et al., 2017). We have also learned how attitudes about transgender people and transgender rights differ from attitudes about gay people and gay rights (Lewis et al, 2017). Experimental studies have found that canvassers can durably reduce transphobia (Broockman and Kalla, 2016), exposure to information and images of transgender people can also reduce transphobia (Flores et al, 2017), and that value frames and identity have the potential to affect support for transgender people's access to public restrooms (Harrison and Michelson, 2017a; 2017b).

We contribute to this growing literature by testing a proposed causal mechanism between exposure to transgender people and increased support for transgender rights: prejudice reduction. Prejudice reduction, as used here, is when negative attitudes and phobias towards marginalized groups are lowered (Allport, 1979). We use a survey experiment to assess how prejudice reduction serves as a vehicle for individual support for transgender rights.

Quite possibly, the most seminal work in attitude change about marginalized groups is Allport's (1954) theory of interpersonal contact. Subsequent studies, especially studies about the rights of sexual minorities and more recently gender minorities, investigate the way personally knowing someone who is lesbian, gay, bisexual, and/or transgender (LGBT) is associated with

attitudes on LGBT rights. The presumed, though often untested, mechanism-linking contact to greater policy support is prejudice reduction. However, is this assumption correct? Does prejudice reduction serve as a vehicle to greater support for rights for marginalized groups? Our experiment tests this causal mechanism by exposing individuals to short informational vignettes and facial images of people presumed to be transgender. Our post-test then measures transphobia and support for transgender rights policies. We find that prejudice reduction is a mechanism for support for transgender rights. We further show that our results are robust to key assumptions related to the causal mechanisms of attitude change.

Mere Exposure and Prejudice Reduction: A Mechanism to Increased Policy Support?

Although our treatments are not the same as the contact hypothesis, studies have shown that simple exposure to out-groups can reduce prejudices (Zajonc, 1968; 2001; Zebrowitz, White, and Wieneke, 2008). Previous studies, for example, have shown that exposure to the lives of lesbians and gay men via television increases both positive attitudes toward gay men (Schiappa, Gregg, and Hewes, 2005) and support for lesbian and gay rights (Garretson, 2015). The mere exposure hypothesis contends that simply exposing people to new concepts has the tendency to increase likeability toward those objects. Indeed, an experimental study shows that mere exposure to facial images and information about transgender people can reduce discomfort with transgender people and transphobia (Flores et al, 2017). However, both Flores et al. (2017) and Broockman and Kalla (2016) failed to find any direct effect of treatments affecting individual attitudes on transgender rights. In follow-up surveys and a subsequent survey experiment, Broockman and Kalla (2016) later defined the term transgender to both treated and untreated households and randomized exposure to negative transgender campaign advertisements

to connect their canvassing experiment to individual support for transgender rights. We add to these studies by more fully examining this mechanism.

A puzzle in both previous experiments is that respondents' prejudices toward transgender people were reduced, yet there is little evidence of a direct effect on attitudes on transgender rights. Possibly, there are multiple mechanisms underlying the direct effect of mere exposure or canvassing on transgender rights. Some of these effects may be competing. For example, people with higher disgust levels tend to be opposed to gay rights (Adams, Stewart, and Blanchar, 2014), and LGBT rights may also increase people's disgust (Casey, 2015). If the experimental treatments simultaneously increased disgust levels *and* reduced transphobia, then the direct effect may be washed-out by these competing mechanisms. Thus, our study decomposes this direct effect using a mediation model. The mediation model separates the specified causal mechanism—in the current case, transphobia—from the remaining, unobserved mechanisms linking treatment to support for transgender rights.

Data and Analysis

We fielded a survey experiment that was jointly sponsored by some of the institutions affiliated with the authors. Clear Voice Research (CVR) conducted the survey experiment June 12-15, 2015. CVR maintains a panel of respondents who serve as a subject pool for research purposes. This pool was pre-screened with a member profile survey, and CVR utilized numerous validation methods, such as IP and street address verification to minimize duplicate respondents and ensure the overall quality of the data. The sampling methodology is an enhancement over student and online convenience samples such as Amazon Mechanical Turk.[1] We note that this sample, while an improvement, was not selected using traditional probability-based methods.

[1] We pre-tested the survey experiment with a sample of 247 people recruited through Amazon Mechanical Turk. While many of the results are similar to what we report here, the MTurk sample tended to exaggerate treatment effects.

CVR sent 51,492 recruitment emails to empaneled survey participants. A total of 2,102 subjects participated in the survey, which provided a response rate of 10.82% (AAPOR RR#2). All subjects consented to participate in the study.

Research Design

Treatment: Informational vignettes and facial images. Respondents were randomly assigned to one of four conditions (3 treatment groups and 1 control group). The three treatment groups each received an information vignette that defined gender identity and transgender as:

> "Gender identity refers to how a person identifies their own gender (as a man, woman, or some other label). For many people their gender identity may not match their birth sex. For example, a man may identify more as female, or a woman may identify more as male. Transgender is a general term for people whose gender identity or expression is different from their birth sex. Some transgender people may undergo gender transition with medical procedures like hormone therapy or surgery (often commonly called a 'sex change'), but others do not seek such medical assistance. Transgender includes groups you might have heard before, including transsexual, cross-dressers, or gender queer people."

The control group received a vignette about Japanese economic growth. Subjects in two of the three treatment groups also received images of gender congruent or gender incongruent male and female faces (see Figure 1).[2] Respondents in the Congruent condition received both facial images of Figure 1a, and respondents in the Incongruent condition received both facial images of Figure 1b. The other treatment group (No Image) received no images but got the gender identity-defining vignette. Flores et al. (2017) previously showed these exposures have the effect of reducing transphobia and discomfort toward transgender people, but did not find any significant direct treatment effects on support for transgender rights. In this study, we expected the treatments to cause positive shifts in attitudes consistent with the mere exposure hypothesis. Our goal in this analysis was to show how exposure might cause support for transgender rights by

[2] The facial images selected for our treatment groups came from a social psychological study (Gerhardstein and Anderson, 2010). We received permission from the authors to use these images in the study.

way of reducing transphobia. We expected that transphobia would mediate the relationship between exposure and attitudes about transgender rights.

[Figure 1 about here]

Mediator variable: Genderism and transphobia. In the survey post-test, we measured transphobia with questions from the Genderism and Transphobia Scale (GTS) designed to gauge people's general tolerance for gender non-conformity (Hill and Willoughby, 2005). The entire GTS contained 32 questions to measure two or three correlated constructs: genderism, transphobia, and gender-bashing.[3] We used a subset of five items from the GTS to measure transphobia, an emotional dislike against people who violate gender norms. Each of the questions utilized a 7-point strongly agree to strongly disagree scale. The five items scaled onto a single construct ($\alpha = 0.91$). We rescaled the items such that positive values indicate higher levels of tolerance for gender non-conformity. Full question wordings are provided in Supporting Information (SI) 2. The mediator variable was measured utilizing structural equation models (i.e., factor analysis) with its mean set to zero and variance set to one for identification purposes.

Dependent Variables: Equality and Accommodations Policies.

We also included a set of questions about transgender rights after the measurement of transphobia; these questions were first asked in a 2011 Public Religion Research Institute survey on transgender rights (see Flores 2015, Table 1). We also adapted questions relating to gay rights from sources like the Gender Social Survey or American National Election Studies, and we developed questions that were unique to transgender rights (e.g., public accommodations and access to public restrooms). These indicators were measured on a 4-point scale, ranging from completely agree to completely disagree that had no neutral category. We created scales of these

[3] The factors are two or three because Hill and Willoughby (2005) initially found that genderism and transphobia were separate constructs but a follow-up study found they were a single construct.

policy questions by first assessing whether transgender rights should be treated as unidimensional or multidimensional (see also Miller et al., 2017). These policies were more easily grouped into two dimensions: policies relating to equality and policies uniquely relating to accommodations (see Flores et al, 2017; Appendix D). Our analysis of transgender rights used these subsets, and positive values related to greater support for transgender rights.

Equality policies were defined as policies that ensure the equal treatment of transgender people. This included whether transgender people should be protected from job discrimination, allowed to serve openly in the military, and included in equal rights generally as would be the case for lesbians, gay men, and other citizens. Accommodations policies were defined as policies that would offer additional protections for transgender people.[4] These policies involved both public and private accommodations, including the use of public restrooms, medical treatment for transgender health issues, and businesses' right to use religious reasons to refuse services to transgender people.

Methods of Analysis

Propensity score weighting. We initially conducted a full assessment of balance checks based on responses to the pre-test questionnaire and demographics. Our experiment was a part of a larger survey, and 267 respondents failed to complete the questionnaire prior to the treatment administration. The balance checks indicated some significant differences across our treatment groups in responses to the pre-test, so we created covariate balance propensity scores (CBPS) to reduce these differences (Fong, Ratkovic, and Imai, 2014; Imai and Ratkovic, 2014).

Covariate adjustment. We also used covariate adjustment to increase the efficiency of estimated effects (Gerber and Green, 2012; Ho et al., 2007). We adjusted for pre-test levels of moral traditionalism by combining four questions into a single scale ($\alpha = 0.75$); the question

[4] We have alternatively conceptualized these measures as relating to transgender bodies (Miller et al, 2017).

wordings came from the American National Election Studies. We included partisanship by using a traditional 7-point indicator ranging from strongly Democratic to strongly Republican. We additionally controlled for age, race, sex, and whether someone identifies as LGBT.[5]

Structural equation modeling. Structural equation modeling (SEM) allowed us to simultaneously estimate a measurement model for our dependent variables, examine the structural parameters of the treatment effects, and decompose effects for causal mechanisms. SEM used the responses to sets of indicators to form constructs that correct for potential measurement error in any single item. The resultant continuous constructs were then used as dependent variables in regression models. Since the items forming the constructs were ordinal, we use a weighted least square with mean adjusted variance (WLSMV) estimator, which is the best multivariate estimator with ordinal data (Brown, 2006). We standardized all of the constructs to have a mean of zero and variance of one. The linear structural equation model might carry with it untenable assumptions in identifying causal mechanisms (Imai et al., 2011). As such, we also presented results from sensitivity analyses on the key causal assumption of exogeneity of the mediator and outcome variables given that both are in the post-test also referred to as sequential ignorability.

The model schematic is plotted in Figure 2, which shows the role of the mediator on transgender rights. Our goal was to examine the role of causally reducing transphobia as an underlying mechanism of increasing support for transgender rights. Given previous research findings, we expected the treatments to reduce transphobia, and we anticipated exposure effects to induce greater support on both transgender rights scales. We conducted two mediation models: the first with the dependent variable being equality policies and the second with the dependent

[5] The age cohorts are 30-44, 45-64, 65-older with 18-29 as the reference group. The race categories are black, Hispanic, Asian, Native American, and multiracial with white as the reference group.

variable being accommodations policies. We estimated the mediation models relying on the Imai et al. (2011) framework as implemented by Muthèn (2011). Thus, the indirect effects were also the Average Causal Mediation Effects.

[Figure 2 about here]

Results

Both models converged and showed adequate model fit with both the Comparative Fit Index and Tucker-Lewis Index above 0.95. Consistent with expectations, transphobia had an effect on people's attitudes on transgender rights. A one standard deviation reduction in transphobia corresponded with a 0.58 standard deviation increase in support of equality policies (s.e. = 0.02, $p<0.01$) and a 0.68 standard deviation increase in support of accommodations policies (s.e. = 0.02, $p<0.01$). Also consistent with expectations, the treatments had reductions in transphobia relative to the control. The No Image treatment reduced transphobia by 0.19 standard deviations (s.e. = 0.07, $p<0.01$); the Congruent treatment reduced transphobia by 0.13 standard deviations (s.e. = 0.13, $p<0.05$), and the Incongruent treatment reduced transphobia by 0.18 standard deviations (s.e. = 0.07, $p<0.01$).[6]

These results are consistent with our earlier finding that the effects of the treatment have little direct relationship to views about transgender rights (Flores et al., 2017). Yet the mediation analysis presented in Table 1 suggests this null relationship may be driven by the mediated relationship between the treatments and transgender rights. The treatments in the present analysis showed statistically insignificant overall effects on transgender rights, but statistically significant effects on reducing transphobia. The results showed that there is a negative, but often statistically

[6] The effect of the Incongruent treatment reduced transphobia by 0.19 standard deviations in the Accommodations policies model (s.e. = 0.07, $p<0.01$). All other treatment effects on transphobia are the same in both models.

insignificant direct effect of exposure to transgender information and images on support for transgender rights. Importantly, we found statistically significant indirect effects on transgender rights by reducing transphobia. Exposure tended to increase support on both transgender rights constructs about one-tenth of a standard deviation, which is a relatively small effect size. This pattern was consistent in both equality policies and accommodations policies, and the exposure effect sizes are similar across treatment groups. The effects of the congruent image were slightly smaller than that of the other treatments, but they did not differ in any statistically significant way. As documented in SI 5, we found that these effects were similar for Democrats, larger for independents, and were null for Republicans.

[Table 1 here]

When assessing the effect size relative to the total effect of treatment on our dependent variables, Alwin and Hauser (1975) recommended reporting the percent mediated out of the sum of the absolute value of these effects in models where the direct and indirect effects are of opposite signs. We find that the indirect effect ranges from 42.2% to 68.0% of the total absolute effect of treatment on transgender rights. This suggests that a substantial portion of the effect of the treatment is mediated by transphobia.

Since transphobia was measured in the post-test along with transgender rights, there may be unmeasured confounders in both levels of transphobia and support for transgender rights. We only observed an individual's responses on transgender rights and transphobia after receiving treatment, so the potential outcomes of individual support for transgender rights in a treatment group given that person's level of transphobia had they been in the control remained counterfactual. A key identification assumption for causal mechanisms was that there is no residual correlation between the mediator and outcome variables or sequential ignorability (Imai

et al., 2011). This assumption, however, can be evaluated by varying how much of a residual correlation would have to be present to alter or reverse the results. A robust relationship will not be sensitive to causal identification assumptions. We find that our findings are relatively insensitive to the underlying assumptions to estimating causal mechanisms (see SI 4).

Discussion

Public attitudes on transgender rights have become a relatively recent area of inquiry and these attitudes are consequential to whether states have transgender-inclusive policies (e.g., Flores, Herman, and Mallory, 2015). Yet, experimental studies fail to show their treatments have any direct effect on transgender rights. Following Broockman and Kalla (2016), we suggest that this is because experimental treatments affect attitudes on transgender rights indirectly.

Our findings offer some guidance for those seeking to influence public attitudes on transgender rights. First, reducing transphobia is a key mechanism for garnering support for transgender rights. Second, a way to reduce transphobia is to humanize transgender people by exposing individuals to information about them and representations of them. Finally and consistent with our earlier findings (Flores et al., 2017), attitudes about transgender people are likely not dependent on perceived gender conformity. Exposure to both our perceived congruent and incongruent images had similar effects on reducing transphobia. We do note that this does not mean that in highly sensitive circumstances, such as when transgender people are in public restrooms, that the potential for harassment, discrimination or assault is not dependent on perceived conformity (Miller and Grollman, 2015). Such contexts may be unique circumstances. In addition, because we show both images of gender conforming males and females to our respondents rather than putting them into separate treatments by sex, treatment effects might

actually differ for gender conforming/nonconforming transmen and transwomen. Anecdotally, that is very plausible.

Fully unpacking the causal mechanism from exposure to policy support has eluded previous research. We provide some evidence that prejudice reduction is indeed a vehicle for enhancing support for marginalized groups. Further research should undertake more robust experimental designs that would clearly account for sequential ignorability and post-treatment bias. Our sensitivity analyses suggest our results are robust to the former assumption but do little to address the latter. Alternative research designs as suggested by Imai et al. (2011) would facilitate in clearly specifying the ways in which prejudice reduction enhances public support for the rights of minority groups.

References

Adams TG, Stewart PA and Blanchar JC (2014) Disgust and the politics of sex: Exposure to a disgusting odorant increases politically conservative views on sex and decreases support for gay marriage. *PLoS ONE* 9(5), doi: 10.1371/journal.pone.0095572.

Allport GW (1954) *The nature of prejudice.* Cambridge, MA: Addison-Wesley.

Alwin DF, Hauser RM (1975) The decomposition of effects in path analysis. *American Sociological Review* 40(1): 37-47.

Broockman D and Kalla J (2016) Durably reducing transphobia: A field experiment on door-to-door canvassing. *Science* 352(6282): 220-224.

Casey LG (2016) The politics of disgust: Public opinion toward LGBTQ people and policies. PhD diss., University of Michigan, Ann Arbor MI.

Flores AR (2015). Attitudes toward transgender rights: Perceived knowledge and secondary interpersonal contact. *Politics, Groups, and Identities* 3(3): 398-416.

Flores AR, Haider-Markel DP, Lewis, DC, Miller PR, Tadlock BL and Taylor JK (2017) Challenged expectations: Mere exposure effects on attitudes about transgender people and rights. *Political Psychology* 39(1): 197-216.

Flores AR, Herman JL and Mallory C (2015) Transgender inclusion in state non-discrimination policies: The democratic deficit and political powerlessness. *Research and Politics*, DOI: 10.1177/2053168015612246.

Fong C, Ratkovic M and Imai K (2014) CBPS: R package for covariate balancing propensity score. R package version 0.8. http://CRAN.r-project.org/package=CBPS (accessed November 25, 2015).

Garretson JJ (2015) Exposure to the lives of lesbians and gays and the origin of young people's greater support for gay rights. *International Journal of Public Opinion Research* 27(2): 277-288.

Gehardstein KR and Anderson VN (2010) There's more than meets the eye: Facial appearance and evaluations of transsexual people. *Sex Roles* 62: 361-373.

Gerber AS and Green DP (2012) *Field experiments: Design, analysis, and interpretation*. New York, NY: W.W. Norton and Company.

Haider-Markel D, Miller P, Flores A, Lewis DC, Tadlock B and Taylor J (2017) Bringing "T" to the table: Understanding individual support of transgender candidates in public office. *Politics, Groups, and Identities* 5(3): 399-417.

Harrison BF and Michelson MR (2017a) *Listen, we need to talk: How to change attitudes about LGBT rights*. New York, NY: Oxford University Press.

Harrison BF and Michelson MR (2017b) Using experiments to understand public attitudes towards transgender rights. *Politics, Groups, and Identities* 5(1): 152-160.

Hill DB and Willoughby BL (2005) The development and validation of the genderism and transphobia scale. *Sex Roles* 53(7): 531-544.

Ho DE, Imai K, King G and Stuart EA (2007) Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference. *Political Analysis* 15(3): 199-236.

Imai K and Ratkovic M (2014) Covariate balancing propensity score. *Journal of the Royal Statistical Society* 76(1): 243-263.

Imai K, Keele L, Tingley D and Yamamoto T (2011) Unpacking the black box of causality: Learning about causal mechanisms from experimental and observational studies. *American Political Science Review* 105(4): 765-789.

Lewis DC, Flores AR, Haider-Markel DP, Miller PR, Tadlock BL and Taylor JK (2017) Degrees of acceptance: Variation in public attitudes toward segments of the LGBT community. *Political Research Quarterly* 70(4): 861-875.

Miller PR, Flores AR, Haider-Markel DP, Lewis DC, Tadlock BL and Taylor JK (2017) Transgender politics as body politics: Effects of disgust sensitivity and authoritarianism on transgender rights attitudes. *Politics, Groups, and Identities* 5(1): 4-24.

Miller LR and Grollman EA (2015) The social costs of gender nonconformity for transgender adults: Implications for discrimination and health. *Sociological Forum* 30(3): 809–831.

Muthén BO (2011) *Applications of causally defined direct and indirect effects in mediation analysis using SEM in Mplus.* Log Angeles, CA: Muthén and Muthén.

Pierceson J and Kirzinger A (2015) Examining attitudes towards the "T" in LGBT: Public support for transgender rights and supportive policies. Springfield, IL: University of Illinois. < https://transgenderinclusivepolicysurvey.wordpress.com/project-overview/> [Accessed March 3, 2016].

Schiappa E, Gregg PB and Hewes DE (2006) Can one TV show make a difference? Will & Grace and the parasocial contact hypothesis. *Journal of Homosexuality* 51(4):15-37.

Tadlock BL, Flores AR, Haider-Markel DP, Lewis DC, Miller PR and Taylor JK (2017) Testing contact theory and attitudes on transgender rights. *Public Opinion Quarterly* 81(4): 956-972.

Zajonc RB (1968) Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology Monograph Supplement* 9(2, part 2): 1-27.

Zajonc RB (2001) Mere exposure: A gateway to the subliminal. *Current Directions in Psychological Science* 10(6): 224-228.

Zebrowitz LA, White B and Wieneke K (2008) Mere exposure and racial prejudice: Exposure to other-race faces increases liking for strangers of that race. *Social Cognition* 26(3): 259-275.

Tables

Table 1: Mediation model results

	Equality Policies	Accommodations Policies
No Image Treatment		
Direct	-0.15 (0.067)*	-0.07 (0.077)
Indirect: Transphobia	0.11 (0.042)**	0.13 (0.048)**
Percent Mediated	42.2% (13.8)**	66.1% (26.0)**
Congruent Image Treatment		
Direct	-0.04 (0.067)	-0.10 (0.077)
Indirect: Transphobia	0.08 (0.041)*	0.09 (0.048)*
Percent Mediated	68.0% (41.5)*	46.0% (21.5)*
Incongruent Image Treatment		
Direct	-0.10 (0.071)	-0.08 (0.080)
Indirect: Transphobia	0.11 (0.041)**	0.13 (0.048)**
Percent Mediated	51.5% (18.6)**	60.5% (23.9)**
N	1,931	1,931
R^2	0.38	0.45
CFI	0.96	0.98
TLI	0.95	0.98
RMSEA [90 % CI]	0.060 [0.057, 0.063]	0.038 [0.034, 0.041]

Note: *p<0.05; **p<0.01 (one-tailed); CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; CI = confidence interval.

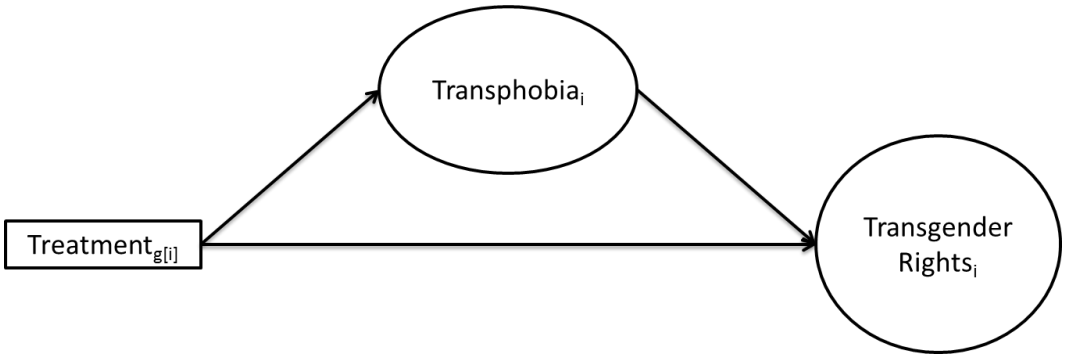
Figures

Figure 1: Facial exposure treatments. (a) the congruent treatment; (b) the incongruent treatment

(a)

(b)

Figure 2: Structural equation model schematic



Supporting information for: "Transgender Prejudice Reduction and Opinions on Transgender Rights: Results from a Mediation Analysis on Experimental Data"

Supporting Information 1: Full regression results in table form

Table SI.1 provides the model results from the structural mediation model.

Table SI.1: Regression results

	(1)		(2)	
	Transphobia	Egalitarian Policies	Transphobia	Accommodations Policies
Transphobia	--	-0.58 (0.018)***	--	-0.68 (0.019)***
No Image	-0.19 (0.072)***	-0.04 (0.077)	-0.19 (0.072)***	0.06 (0.086)
Congruent	-0.13 (0.071)**	0.04 (0.075)	-0.13 (0.071)**	-0.02 (0.085)
Incongruent	-0.18 (0.071)**	0.01 (0.076)	-0.18 (0.071)**	0.04 (0.088)
Traditionalism	0.96 (0.033)***	-0.66 (0.033)***	0.97 (0.033)***	-0.86 (0.041)***
Partisanship	0.07 (0.014)***	-0.11 (0.015)***	0.07 (0.014)***	-0.11 (0.018)***
Female	-0.31 (0.052)***	0.32 (0.056)***	-0.30 (0.052)***	0.24 (0.064)***
30-44 Years old	0.05 (0.087)	-0.06 (0.098)	0.05 (0.088)	-0.06 (0.115)
45-64 Years old	0.02 (0.083)	-0.03 (0.0991)	0.02 (0.083)	0.08 (0.107)
65 years or more	0.08 (0.094)	0.14 (0.101)^	0.09 (0.094)	0.13 (0.118)
College graduate	-0.04 (0.055)	-0.02 (0.057)	-0.04 (0.055)	-0.05 (0.065)
Black	0.73 (0.081)***	-0.27 (0.097)***	0.73 (0.081)***	-0.41 (0.111)***
Latino	0.44 (0.124)***	-0.21 (0.144)^	0.44 (0.124)***	-0.30 (0.167)***
Asian	0.39 (0.141)**	-0.04 (0.185)	0.39 (0.142)**	-0.45 (0.205)*
Native American	0.03 (0.462)	-0.36 (0.365)	0.02 (0.469)	0.01 (0.296)
Multiracial	-0.15 (0.154)	0.16 (0.186)	-0.14 (0.154)	-0.04 (0.207)
LGBT	-0.58 (0.085)***	0.57 (0.106)***	-0.58 (0.085)***	0.13 (0.123)
N	1,931		1,931	
R-squared	0.509	0.377	0.511	0.451
RMSEA	0.060 [0.057, 0.063]		0.038 [0.034, 0.041]	
CFI	0.96		0.98	
TLI	0.95		0.98	

Note: RMSEA = Root mean square of approximation; CFI = Comparative fit index; TLI = Tucker-Lewis Index; ^p<0.10; *p<0.05; **p<0.01; ***p<0.001 (one-tailed); standard errors in parentheses; 90% confidence interval in brackets.

Supporting Information 2: Question wordings and measurement model

Table S.2 reports the question wording used to measure discomfort, transphobia, and public attitudes on transgender rights. Table S.3 shows the factor loadings from the measurement portions of the models. Table S.4 has additional question wordings for traditionalism and partisanship.

Table S.2: Question wording of the latent variables

Scale	Wording
Transphobia	*Which response best indicates how you feel?* (7 pt. scale)
GTS 1	Sex change operations are morally wrong
GTS 2	If a friend wanted to have his penis removed in order to become a woman, I would openly support him
GTS 3	A man who dresses as a woman is a pervert
GTS 4	It is morally wrong for a woman to present herself as a man in public
GTS 5	God made two sexes and two sexes only
Policies	*We provide a few statements about transgender people. Please tell us how much you agree or disagree with each one.* (4 pt. scale)
Policy 1	Legal protections that apply to gay and lesbian people should also apply to transgender people.
Policy 2	Congress should pass laws to protect transgender people from job discrimination.
Policy 3	Congress should not pass laws to protect transgender people from discrimination in public accommodations.
Policy 4	Insurance companies should not be required to pay for medical treatment related to transgender health issues.
Policy 5	Laws should protect transgender children from bullying in schools.
Policy 6	Businesses should have the right to refuse services to transgender people based on religious beliefs.
Policy 7	Transgender people deserve the same rights and protections as other Americans.
Policy 8	Transgender people should only be allowed to use public restrooms that are consistent with the sex listed on their driver's license/state ID card.
Policy 9	Transgender people should be allowed to serve openly in the military.

Table S.3: Measurement models of latent variables

	Mediator		Outcomes
Indicator	Transphobia	Indicator	Equality Policies
GTS 1	-0.88	Policy 1	-0.85
GTS 2	0.70	Policy 2	-0.85
GTS 3	-0.77	Policy 5	-0.74
GTS 4	-0.86	Policy 7	-0.89
GTS 5	-0.64	Policy 9	-0.74
Indicator	Transphobia	Indicator	Accommodations Policies
GTS 1	-0.90	Policy 3	0.66
GTS 2	0.64	Policy 4	0.58
GTS 3	-0.75	Policy 6	0.74
GTS 4	-0.87	Policy 8	0.47
GTS 5	-0.68		

Note: Standardized factor loadings are reported; all factor loadings are statistically significant at a two-tailed $p<0.05$.

Table S.4: Question wording of partisanship and moral traditionalism

Scale/Item	Wording
Partisanship	In politics TODAY, do you consider yourself a Republican, Democrat, or independent?
	Would you call yourself a strong Republican/Democrat or not very strong?
	Do you think of yourself as close to the Democratic or Republican party?
Moral Traditionalism	*Below is a series of statements about contemporary society. Please indicate the degree to which you agree or disagree with each statement.* (5 pt. scale)
	The world is always changing and we should adjust our view of moral behavior to those changes.
	The newer lifestyles are contributing to the breakdown of our society.
	We should be more tolerant of people who choose to live according to their own moral standards, even if they are very different from out own.
	This country would have many fewer problems if there were more emphasis on traditional family ties.

Supporting Information 3: Demographics and balance checks

The demographic characteristics of this panel closely resemble that of the United States population on several important traits. The Table S.5 displays the demographics of this sample compared to MTurk samples (adapted from Berinsky et al., 2012) and the National Annenberg Election Study (Johnston et al., 2008).

We created covariate balance propensity scores (CBPS) to reduce demographic differences in the pre-test (Fong, Ratkovic, and Imai, 2014; Imai and Ratkovic, 2014). Propensity score weighting estimated from baseline covariates makes the estimation of causal effects more efficient (Loux, 2015). CBPS is ideal for our case because the process achieves covariate balance across multiple treatment conditions. The model estimated using CBPS also provides a fit statistic that indicates that our estimation is not inappropriately specified (Hansen's-J = 20.45, 15 d.f.).[7] This process removed an additional 71 respondents due to item non-response, which was not related to treatment assignment. There were no significant differences in balance checks after weighting on these propensity scores. We report in Table S.6 the p-value of tests of independence between demographics and pre-test variables both before and after propensity score weighting. All of the p-values are generated from chi-square tests or their equivalent weighted F test. The Equal Rights p-values come from regression F tests because the dependent variable ranged from 0 to 10 on how strongly one feels a group should have equal rights.

[7] The results do not substantively differ whether we incorporate these weights or not.

Table S.5: Demographic characteristics of the survey participants, MTurk workers, and 2008 NAES

Demographics	**CVR, June 2015**	**MTurk**	**NAES 2008**
Age (mean years)	50.6	20.3	50.05
Female (%)	49.2	60.1	56.62
Education (% completing college or more)	39.7	-	37.1
White (%)	80.5	83.5	79.12
Black (%)	9.2	4.4	9.67
Asian (%)	3.2	-	2.53
Latino (a) (%)	4.1	-	6.3
Multi-racial (%)	2.3	-	2.37
Partisanship			
Democrat (%)	44.3	40.8	36.67
Independent (%)	23.4	34.1	20.82
Republican (%)	32.3	16.9	30.61
N	2,102	484-551	19,234

Note: CVR = Clear Voice Research; MTurk = Amazon Mechanical Turk; NAES = National Annenberg Election Survey.

Table S.6: Tests of independence among demographics and pre-test across treatment conditions

Item	Unweighted *p*-value	Weighted *p*-value
Gender	0.86	0.64
Age Group	0.92	0.92
Race	0.41	0.27
Ideology	0.44	0.37
Partisanship	0.42	0.66
Religious Identification	0.66	0.40
Religious Importance	0.59	0.94
Religious Strength	0.13	0.92
Religious Attendance	0.52	0.39
LGB Friends	0.49	0.84
Transgender Friends	0.57	0.57
Traditionalism, first item	0.45	0.98
Traditionalism, second item	0.17	0.99
Traditionalism, third item	0.06	0.99
Traditionalism, fourth item	0.36	0.55
Equal Rights, Blacks	0.04	0.78
Equal Rights, Women	0.06	0.83
Equal Rights, Muslims	0.06	0.93
Equal Rights, Hispanics	0.06	0.82

Supporting Information 4: Sensitivity analysis

Figures S.1 and S.2 present results of sensitivity analyses varying how much residual correlation would have to present in order to alter our findings. Figure 2 shows that the direct effects on equality policies are highly sensitive to causal identification assumptions. Figure 2 also shows that the causal mechanism is more stable to identification assumptions. A positive residual correlation of 0.6 in each treatment group would have to be observed in order to render the observed effects null and negative. Figure 3 shows similar patterns on accommodations policies. The residual correlation would have to be even larger at 0.8 in each treatment group to alter the observed effects to be null and negative. For both assessments, we find that our findings are relatively insensitive to the underlying assumptions to estimating causal mechanisms.

Figure S.1: Sensitivity of direct and indirect effects on Equality policies

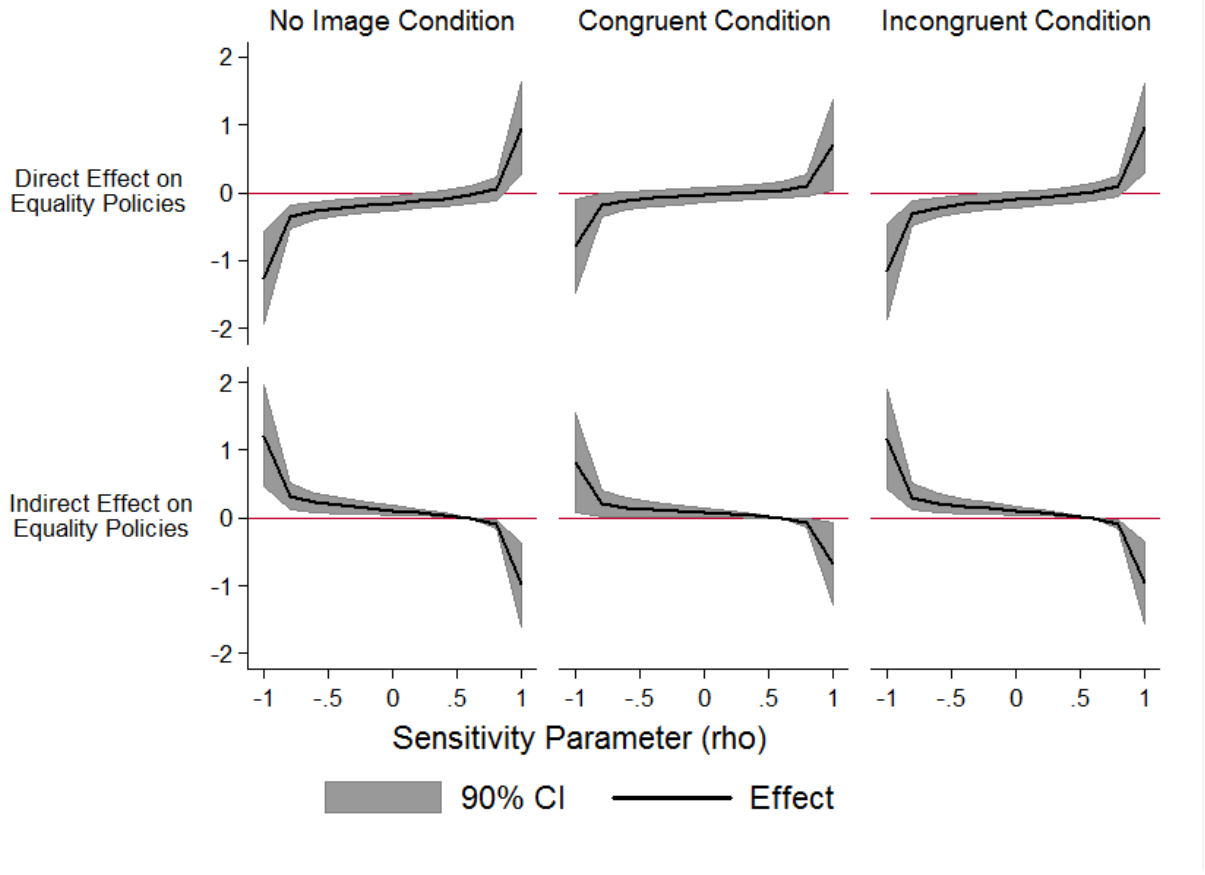
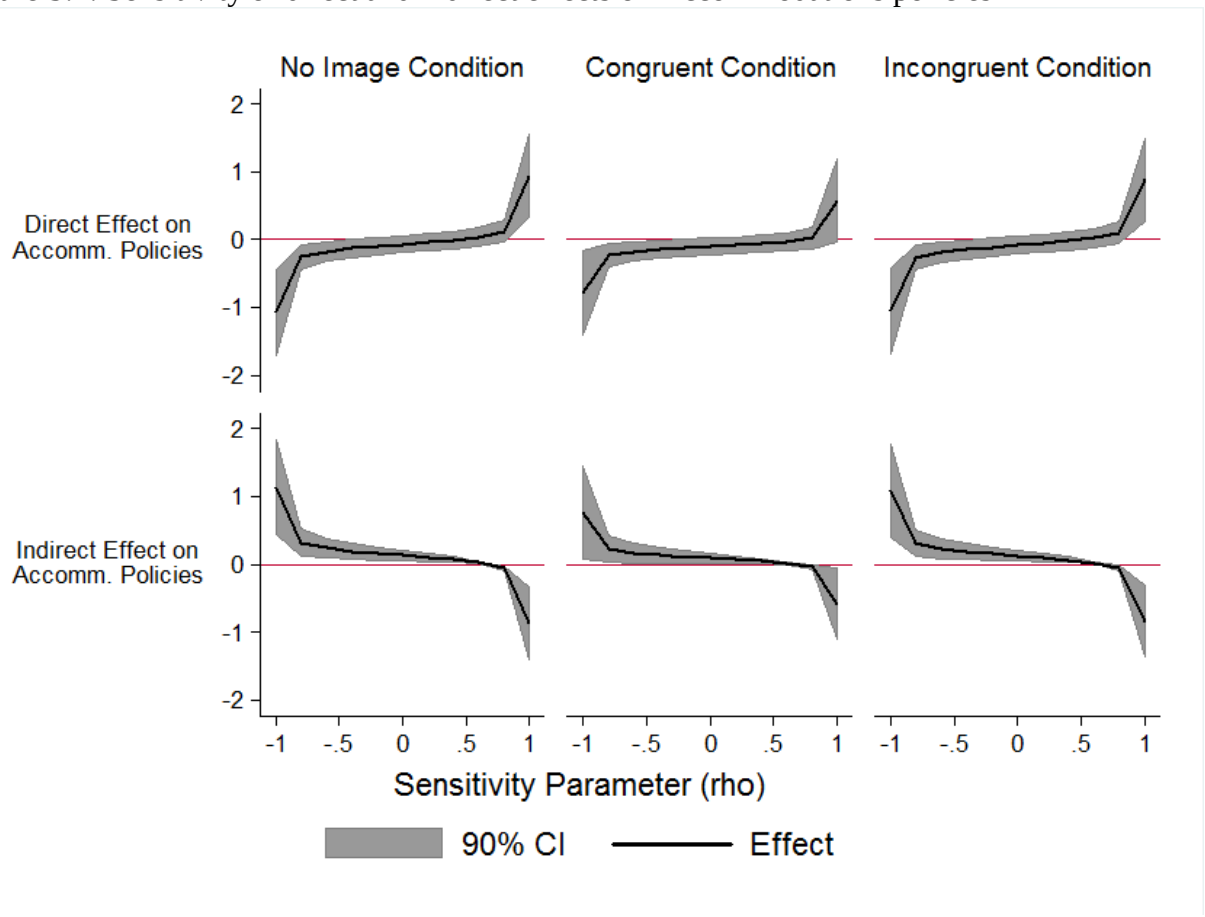


Figure S.2: Sensitivity of direct and indirect effects on Accommodations policies



Supporting Information 5: Heterogeneous mediation effects by partisanship

Flores et al. (2017) showed that the vignette treatments with facial images had heterogeneous treatment effects by partisanship. We also find similar heterogeneous effects in the mediation analysis. Democrats experience transgender prejudice reduction by treatment, which is similar to the overall effects of the sample. We see on about 0.17-0.18 standard deviations of prejudice reduction, though these results are marginally significant (i.e., $p<0.10$). Republicans are likewise the least to show any treatment effect either on transphobia or on transgender rights. If there is a significant effect, as reported in Table S.9, it shows that Republicans have no indirect effect of mere exposure and the direct effects of the treatment show negative and statistically significant responses to the treatment. Thus, for Republicans mere exposure may lead to a backlash of sorts. This is unlikely surprising given how conservative political groups have either not responded or responded negatively to other LGBT related phenomenon such as the contact hypothesis (Skipworth, Garner, and Detrey, 2010). Interestingly, the group most affected by treatments is political Independents. Those who do not align with a political party show the strongest reductions in transphobia, and the average causal mediation effect tends to be positive and statistically significant.

Our findings suggest that the average effects we observe in the sample are most similar to Democrats, and our results are stronger among political Independents. For those whose party affiliation is Republican, there are seldom significant effects and, when there are significant effects, tend to reduce support for transgender rights.

Table SI.7: Regression results for Democrats

	(1)		(2)	
	Transphobia	Egalitarian Policies	Transphobia	Accommodations Policies
Transphobia	--	-0.59 (0.026)***	--	-0.78 (0.025)***
No Image	-0.18 (0.11)^	-0.10 (0.115)	-0.19 (0.109)*	0.29 (0.133)*
Congruent	-0.17 (0.11)^	0.05 (0.112)	-0.17 (0.107)^	0.12 (0.129)
Incongruent	-0.17 (0.11)^	-0.03 (0.114)	-0.17 (0.108)^	0.16 (0.135)
Traditionalism	0.97 (0.049)***	-0.72 (0.052)***	0.98 (0.049)***	-0.78 (0.063)***
Female	-0.37 (0.080)***	0.40 (0.085)***	-0.37 (0.080)***	0.15 (0.097)^
30-44 Years old	0.22 (0.135)^	-0.006 (0.152)	0.23 (0.136)*	-0.06 (0.18)
45-64 Years old	0.22 (0.130)*	-0.005 (0.138)	0.22 (0.130)*	0.02 (0.171)
65 years or more	0.19 (0.147)	0.06 (0.158)	0.19 (0.147)	0.16 (0.186)
College graduate	-0.16 (0.08)*	0.03 (0.086)	-0.17 (0.083)*	-0.06 (0.098)
Black	0.88 (0.098)***	-0.37 (0.107)***	0.89 (0.099)***	-0.42 (0.126)***
Latino	0.42 (0.180)***	-0.25 (0.207)	0.42 (0.179)**	-0.39 (0.229)*
Asian	0.78 (0.219)***	-0.07 (0.306)	0.79 (0.219)***	-0.79 (0.300)**
Native American	0.44 (1.014)	-0.28 (0.564)	0.44 (1.033)	0.83 (0.496)*
Multiracial	-0.05 (0.238)	-0.04 (0.231)	-0.04 (0.238)	0.16 (0.269)
LGBT	-0.45 (0.117)***	0.51 (0.146)***	-0.45 (0.117)***	0.13 (0.159)
N	853		853	
R-squared	0.488	0.330	0.492	0.345
RMSEA	0.042 [0.038, 0.045]		0.030 [0.026, 0.034]	
CFI	0.979		0.986	
TLI	0.978		0.985	

Note: RMSEA = Root mean square of approximation; CFI = Comparative fit index; TLI = Tucker-Lewis Index; ^p<0.10; *p<0.05; **p<0.01; ***p<0.001 (one-tailed); standard errors in parentheses; 90% confidence interval in brackets.

Table SI.8: Regression results for Independents

	(1)		(2)	
	Transphobia	Egalitarian Policies	Transphobia	Accommodations Policies
Transphobia	--	-0.57 (0.034)***	--	-0.59 (0.042)***
No Image	-0.37 (0.155)**	0.22 (0.169)^	-0.37 (0.155)**	-0.06 (0.178)
Congruent	-0.25 (0.159)^	0.08 (0.169)	-0.26 (0.159)^	0.03 (0.178)
Incongruent	-0.27 (0.157)*	0.10 (0.167)	-0.27 (0.157)*	-00.06 (0.186)
Traditionalism	1.03 (0.069)***	-0.55 (0.066)***	-1.03 (0.069)***	-0.84 (0.076)***
Female	-0.51 (0.109)***	0.24 (0.118)*	-0.51 (0.110)***	0.42 (0.134)***
30-44 Years old	-0.07 (0.159)	-0.18 (0.182)	-0.07 (0.159)	-0.02 (0.200)
45-64 Years old	-0.14 (0.153)	-0.08 (0.173)	0.14 (0.153)	0.10 (0.195)
65 years or more	-0.07 (0.200)	-0.11 (0.209)	-0.08 (0.200)	-0.03 (0.232)
College graduate	-0.17 (0.122)^	0.08 (0.125)	-0.18 (0.123)^	-0.08 (0.145)
Black	0.13 (0.181)	0.31 (0.233)^	0.13 (0.181)	-0.002 (0.276)
Latino	0.54 (0.196)**	-0.30 (0.247)	0.54 (0.196)**	0.08 (0.299)
Asian	0.03 (0.309)	0.04 (0.304)	0.03 (0.310)**	0.20 (0.341)
Native American	-0.14 (0.814)	-0.56 (0.490)	-0.14 (0.810)	0.36 (0.836)
Multiracial	-0.41 (0.226)*	0.27 (0.312)	-0.41 (0.227)*	0.02 (0.317)
LGBT	-0.99 (0.169)***	0.52 (0.217)**	-0.99 (0.169)***	0.61 (0.254)**
N	453		453	
R-squared	0.504	0.238	0.507	0.399
RMSEA	0.042 [0.038, 0.045]		0.030 [0.026, 0.034]	
CFI	0.979		0.986	
TLI	0.978		0.985	

Note: RMSEA = Root mean square of approximation; CFI = Comparative fit index; TLI = Tucker-Lewis Index; ^p<0.10; *p<0.05; **p<0.01; ***p<0.001 (one-tailed); standard errors in parentheses; 90% confidence interval in brackets.

Table SI.9: Regression results for Republicans

	(1)		(2)	
	Transphobia	Egalitarian Policies	Transphobia	Accommodations Policies
Transphobia	--	-0.58 (0.032)***	--	-0.67 (0.034)***
No Image	-0.08 (0.129)	-0.19 (0.142)^	-0.08 (0.129)	-0.16 (0.153)
Congruent	-0.002 (0.124)	0.01 (0.136)	0.001 (0.125)	-0.28 (0.162)*
Incongruent	-0.16 (0.128)	-0.02 (0.136)	-0.16 (0.129)	-0.01 (0.157)
Traditionalism	0.95 (0.062)***	-0.68 (0.060)***	0.96 (0.062)***	-1.00 (0.080)***
Female	-0.10 (0.094)	0.34 (0.100)***	-0.10 (0.094)	0.18 (0.120)^
30-44 Years old	-0.18 (0.179)	0.16 (0.196)	-0.18 (0.181)	0.05 (0.225)
45-64 Years old	-0.21 (0.168)	0.12 (0.18)	-0.21 (0.169)	0.23 (0.205)
65 years or more	-0.47 (0.180)	0.50 (0.18)**	-0.47 (0.181)	0.25 (0.219)
College graduate	0.16 (0.096)*	-0.17 (0.100)*	0.15 (0.096)^	-0.04 (0.117)
Black	0.29 (0.239)	-0.19 (0.450)	0.30 (0.241)	-0.91 (0.417)*
Latino	0.24 (0.334)	0.15 (0.358)	0.24 (0.335)	-0.79 (0.435)*
Asian	0.32 (0.253)^	-0.13 (0.405)	0.33 (0.255)^	-0.75 (0.449)*
Native American	-0.49 (1.017)	-0.19 (0.93)	-0.48 (1.025)	0.85 (0.321)**
Multiracial	0.23 (15.75)	0.12 4.394)	0.38 (18.799)	0.54 (5.568)
LGBT	-0.53 (0.213)**	0.68 (0.241)**	-0.52 (0.212)**	-0.40 (0.316)^
N	625		625	
R-squared	0.380	0.278	0.381	0.400
RMSEA	0.042 [0.038, 0.045]		0.030 [0.026, 0.034]	
CFI	0.979		0.986	
TLI	0.978		0.985	

Note: RMSEA = Root mean square of approximation; CFI = Comparative fit index; TLI = Tucker-Lewis Index; ^p<0.10; *p<0.05; **p<0.01; ***p<0.001 (one-tailed); standard errors in parentheses; 90% confidence interval in brackets.

Table 1: Mediation model results

	Democrats	
	Equality Policies	Accommodations Policies
No Image Treatment		
Direct	-0.21 (0.101)*	0.15 (0.112)^
Indirect: Transphobia	0.11 (0.064)^	0.14 (0.083)*
Percent Mediated	33.8% (16.7)*	48.4% (25.0)*
Congruent Image Treatment		
Direct	-0.05 (0.097)	-0.01 (0.111)
Indirect: Transphobia	0.10 (0.063)^	0.13 (0.081)^
Percent Mediated	67.2% (44.7)^	90.1% (69.1)^
Incongruent Image Treatment		
Direct	-0.13 (0.106)	0.03 (0.118)
Indirect: Transphobia	0.10 (0.063)^	0.13 (0.082)^
Percent Mediated	43.3% (23.4)*	80.1% (60.4)^
N	853	853
	Independents	
	Equality Policies	Accommodations Policies
No Image Treatment		
Direct	0.010 (0.149)	-0.27 (0.161)*
Indirect: Transphobia	0.21 (0.009)**	0.22 (0.093)**
Percent Mediated	96.1% (65.7)^	44.3% (17.1)**
Congruent Image Treatment		
Direct	-0.06 (0.154)	-0.12 (0.169)
Indirect: Transphobia	0.15 (0.090)^	0.15 (0.095)^
Percent Mediated	69.5% (51.6)^	54.9% (34.6)^
Incongruent Image Treatment		
Direct	-0.06 (0.154)	-0.22 (0.169)^
Indirect: Transphobia	0.16 (0.089)*	0.162 (0.093)*
Percent Mediated	72.6% (51.6)^	42.7% (22.6)*
N	453	453
	Republicans	
	Equality Policies	Accommodations Policies
No Image Treatment		
Direct	-0.23 (0.124)*	-0.21 (0.144)^
Indirect: Transphobia	0.05 (0.074)	0.05 (0.086)
Percent Mediated	16.3% (23.2)	19.4% (26.2)
Congruent Image Treatment		
Direct	0.008 (0.121)	-0.28 (0.140)*
Indirect: Transphobia	0.001 (0.071)	0.00 (0.08)
Percent Mediated	13.7% (677.9)	0.0% (28.4)
Incongruent Image Treatment		
Direct	-0.11 (0.129)	-0.12 (0.147)
Indirect: Transphobia	0.09 (0.074)	0.11 (0.085)
Percent Mediated	44.2% (31.3)^	47.4% (34.3)^
N	625	625

Note: ^p<0.10; *p<0.05; **p<0.01; ***p<0.001 (one-tailed); standard errors in parentheses.

References

Berinskey AJ, Huber GA and Lenz GS (2002) Evaluating online labor markets for experimental research: Amazon.com's Mechanical Turk. *Political Analysis 20*: 351-368.

Flores AR, Haider-Markel DP, Lewis, DC, Miller PR, Tadlock BL and Taylor JK (2017) Challenged expectations: Mere exposure effects on attitudes about transgender people and rights. *Political Psychology* 39(1): 197-216.

Fong C, Ratkovic M and Imai K (2014) CBPS: R package for covariate balancing propensity score. R package version 0.8. http://CRAN.r-project.org/package=CBPS (accessed November 25, 2015).

Imai K and Ratkovic M (2014) Covariate balancing propensity score. *Journal of the Royal Statistical Society* 76(1): 243-263.

Johnston R, Jamieson KH and Mutz DC (2008) *National Annenberg Election Survey*. Philadelphia, PA: Annenberg Policy Center. <https://services.annenbergpublicpolicycenter.org/naes08/phone/index.html>.

Loux TM (2015) Randomization, matching, and propensity scores in the design and analysis of experimental studies with measured baseline covariates. *Statistics in Medicine* 34(4): 558-570.

Skipworth SAS, Garner A, Dettrey BJ (2010) Limitations of the contact hypothesis: Heterogeneity in the contact effect on attitudes toward gay rights. *Politics & Policy* 38(5): 887-906.