Increasing Public Support for Transgender Rights through Superordinate LGBT+ Rights Framing: Evidence from a U.S. Survey Experiment on Transgender Participation in Sports

Online appendix material

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# Survey Sampling Methodology

Survey research is increasingly turning to online surveys or mixed mode designs that involve combinations of random digit dialing (RDD) and online methods. Researchers generally agree that with either RDD or online samples, probability samples are more representative of the US population than non-probability samples (Malhotra and Krosnick 2007; Chang and Krosnick 2009; Yeager et al. 2011; Kennedy et al. 2016). A number of studies have been conducted involving comparisons mode effects of RDD vs. Online surveys on political attitudes and behavior. Some studies show minimal differences in terms of inference from online vs. phone surveys (Stephenson and Crête 2010; Ansolabehere and Schaffner 2014; Breton et al. 2017; Coppock 2019; Coppock and McClellan 2019). Online survey research itself is in a period of expansion. Pew Research, for example, has now moved much of its polling online: [https://www.pewresearch.org/fact-tank/2019/02/27/what-our-transition-to-online-polling-means-for-decades-of-phone-survey-trends/](https://mobile.highpoint.edu/owa/redir.aspx?C=I8MrCM4aZlX9__ikZTPY9MndiFoTSlG36O1kVCH9UTkPKfu0pw7XCA..&URL=https%3a%2f%2fwww.pewresearch.org%2ffact-tank%2f2019%2f02%2f27%2fwhat-our-transition-to-online-polling-means-for-decades-of-phone-survey-trends%2f) as well as  [https://www.pewresearch.org/fact-tank/2019/02/27/response-rates-in-telephone-surveys-have-resumed-their-decline/](https://mobile.highpoint.edu/owa/redir.aspx?C=NKRvH4h9owEmhJQwMVkIKOe1SbTEFBO_xlPLhIZYG5rvRvdnEg_XCA..&URL=https%3a%2f%2fwww.pewresearch.org%2ffact-tank%2f2019%2f02%2f27%2fresponse-rates-in-telephone-surveys-have-resumed-their-decline%2f).

 We chose online sampling for its cost-effectiveness and field-tested experience at achieving valid, reliable results comparable to RDD probability sampling methods. Online sampling is especially helpful for gaining access to hard-to-reach minority groups and the elderly, and avoids some of the problems of social desirability bias due to enumerator effects in RDD and face-to-face sampling methodologies. Hence, we believed online samples would be forthcoming about their partisan preferences.

Data collection for our project was conducted by Dynata (formerly Survey Sampling International), which has provided survey data for a wide range of research in political science (ex. Kam 2012; Malhotra et al. 2013; Berinsky et al. 2014; Iyengar and Westwood 2015) using online panel surveys. Dynata recruits participants online to form a panel and then randomly invites panel members to participate in given surveys. We requested that Dynata target on several demographic characteristics to ensure the sample they invited was representative of the population of interest, but we did not impose quotas, and subjects within each demographic category were randomly selected from the panel. The resulting sample is not a strict probability sample in that not every resident of the United States has an equal probability of being sampled, but our resulting sample is representative of national-level diversity in the United States on gender, education, age, race and ethnicity, as well as urban-rural demographics. Our results are robust to the use of sampling weights. We anticipate that our results would be easily replicated using alternate sampling modes, and we encourage others to replicate our findings. Our research received IRB approval.

US Residents:

\*             GENDER: Male = 49%, female = 51%

\*             EDUCATION: Bachelor's Degree or Above = 30%, Less than BA = 70%

\*             AGE: 18 - 34 = 30%, 35 - 54 = 40%, 55 and older = 30%

\*             RACE: White = 73%, African-American/black = 15%, Other = 12%,

\*             ETHNICITY: Hispanic/Latinx/Spanish origin = 18%, Other = 82%

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# Ethical Conduct of Research

Scholars have raised concerns about a lack of clear disciplinary standards for ethical conduct of human subject research for some time (Wood 2006; Ford et al. 2007; Fujii 2012; Campbell 2017; Cronin-Furman and Lake 2018). The *American Political Science Association* (2022) has recently updated the discipline’s recommended Human Subjects Research Principles and Guidelines (Section III, p. 3-10). Our research adheres to those guidelines. First, we obtained IRB to conduct this study. However, we support APSA’s (2022) general principle II that “political science researchers have an individual responsibility to consider the ethics of their research-related activities and cannot outsource ethical reflection to review boards, other institutional bodies, or regulatory agencies.” (p. 5). We discuss the main principles adopted by the APSA in further detail, where we reflect by providing our responses to core guidelines.

**Power**

Our research seeks to adhere to principles concerning awareness of power differentials between researcher and researched. We do not have a direct power relationship over any of the respondents in our study. Respondents are also provided with contact information for the academic researchers who are conducting this study. We do not engage in covert or deceptive research practices. Subjects are not paid for their participation in this study. Participation is strictly voluntary, and subjects may refuse to answer questions or leave the study at any time for any reason.

**Consent**

Our research seeks to adhere to principles of informed and voluntary consent“from individuals who are directly engaged by the research process, especially if research involves more than minimal risk of harm or if it is plausible to expect that engaged individuals would withhold consent if consent were sought”. All subjects in our study are clearly informed about the nature of our research by our consent. The consent form states that respondents may refuse to answer questions and may stop participating at any time in the study.

**Deception**

Our research does not engage in covert or deceptive research practices. Subjects are informed about the identity of the researchers in the consent form and debriefing statement.

**Harm and Trauma**

Our research seeks to adhere to principles surrounding harm and trauma, by avoiding and minimizing harm, traumatization and re-traumatization whenever possible. First, we acknowledge that no study is fully without risk. We minimize risk to respondents by acknowledging topics to be covered in the survey and the respondent’s right to refuse to answer any question for any reason and may stop participating in the study at any time. We do not actively seek out or identify respondents in our study. We also provide contact information for our IRB as well as individual researchers associated with the study where respondents may report any concerns with the conduct of the study. No adverse events were reported in the conduct of this study either directly to enumerators or directly to us or our IRB.

**Confidentiality**

Our research seeks to adhere to principles of keeping the identities of research participants confidential. During the study, we collected no personally identifying information on participants. All participants received a consent form, but we requested a signature waiver to protect privacy and anonymity in the data collection process.

**Impact**

Our research seeks to adhere to principles surrounding the consideration of the “broader social impacts of the research process as well as the impact on the experience of individuals directly engaged by the research”. This study gives subjects the opportunity to express their own feelings in survey responses about meaningful social and political problems in the United States. We found subjects to be quite willing to take part in the study, with low refusal rates: they want to express their opinions on important social and political issues and they derive some satisfaction from taking part in the research. We do not intentionally provoke or encourage subjects to engage in political behavior or other political processes or outcomes in the conduct of this study. Our research does not condone or support violence against anyone. It also does not condone or support political violence in any other form with respect to authorities or groups.

**Laws, Regulations, and Prospective Review**

Our research seeks to adhere to principles surrounding the awareness “of relevant laws and regulations governing their research-related activities”*.* We did not seek approval from the U.S. government authorities to conduct this study. However, we are not aware that asking questions about social and political attitudes in the United States is in violation of any local, state, or federal law. Furthermore, as mentioned previously, our research does not condone or support violence or other unlawful behavior against anyone. It also does not condone or support political violence or other unlawful behavior with respect to authorities or groups. We do not actively seek out or identify participants in our study. Our research was also conducted in compliance with laws within the United States, as established by our IRB, and to our knowledge is in accordance with APSA guidelines regarding conduct of human subjects research and data collection using survey research methods.

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# Appendix Table 1. Summary of Variables and Demographics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Variable* | *N* | *Mean* | *SD* | *Min* | *Max* |
| Experimental Treatment Group |  |  |  |  |  |
| LGBT+ Rights Treatment | 683 | 0.50 | 0.50 | 0 | 1 |
| Control Group | 680 | 0.50 | 0.50 | 0 | 1 |
| National LGBT+ Rights Remedy Index | 1360 | 3.01 | 0.82 | 1 | 4 |
| *Congress needs to enact a uniform set of national legal protections.* | 1360 | 2.93 | 0.95 | 1 | 4 |
| *The Supreme Court needs to make clear what rights are/are not protected under the Constitution.* | 1360 | 3.08 | 0.87 | 1 | 4 |
| State/Local LGBT+ Rights Remedy Index | 1359 | 2.61 | 0.95 | 1 | 4 |
| *Let each state decide what’s best for them.* | 1359 | 2.64 | 1.01 | 1 | 4 |
| *Let each local community decide what’s best for them.* | 1358 | 2.59 | 1.01 | 1 | 4 |
| Pre-Treatment Homophobia (1= feel very safe to 4=very unsafe in presence of LGBT+ people) | 1361 | 1.73 | 0.87 | 1 | 4 |
| Women | 1366 | 0.52 | 0.50 | 0 | 1 |
| Age Category |  |  |  |  |  |
| 18-30 | 1343 | 0.19 | 0.39 | 0 | 1 |
| 31-44 | 1343 | 0.25 | 0.49 | 0 | 1 |
| 45+ | 1343 | 0.52 | 0.50 | 0 | 1 |
| Education | 1365 | 3.40 | 1.09 | 1 | 5 |
| Party identification |  |  |  |  |  |
| Democrat | 1366 | 0.44 | 0.50 | 0 | 1 |
| Republican | 1366 | 0.32 | 0.47 | 0 | 1 |
| Independent/unaffiliated | 1366 | 0.20 | 0.40 | 0 | 1 |
| Ideology |  |  |  |  |  |
| Very Conservative | 1366 | 0.23 | 0.42 | 0 | 1 |
| Somewhat Conservative | 1366 | 0.20 | 0.40 | 0 | 1 |
| Moderate | 1366 | 0.31 | 0.46 | 0 | 1 |
| Somewhat Liberal | 1366 | 0.12 | 0.32 | 0 | 1 |
| Very Liberal | 1366 | 0.11 | 0.31 | 0 | 1 |
| Race and Ethnicity |  |  |  |  |  |
| White | 1366 | 0.78 | 0.42 | 0 | 1 |
| African American/Black | 1366 | 0.12 | 0.32 | 0 | 1 |
| Native American | 1366 | 0.02 | 0.13 | 0 | 1 |
| Asian | 1366 | 0.05 | 0.22 | 0 | 1 |
| Multiple | 1366 | 0.02 | 0.15 | 0 | 1 |
| Hispanic/Latinx/Spanish origin | 1366 | 0.12 | 0.32 | 0 | 1 |
| Evangelical Christian | 1366 | 0.34 | 0.47 | 0 | 1 |
| Income assessment | 1365 | 2.78 | 1.05 | 1 | 4 |
| Northeast | 1366 | 0.14 | 0.35 | 0 | 1 |
| Midwest | 1366 | 0.23 | 0.42 | 0 | 1 |
| South | 1366 | 0.45 | 0.50 | 0 | 1 |
| West | 1366 | 0.18 | 0.39 | 0 | 1 |
| Urban-Rural Continuum | 1366 | 4.93 | 2.67 | 1 | 9 |

# Appendix Table 2. Balance Tests Across Demographics

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | (1) |  | (2) |  | (1)-(2) |
|  |  | Control Group |  | LGBT+ Rights Txt |  | Pairwise t-test |
| Variable | N | Mean/(SE) | N | Mean/(SE) | N | Mean difference |
| National LGBT+ Remedy Index | 678 | 3.023 | 679 | 2.987 | 1357 | 0.036 |
|  |  | (0.032) |  | (0.031) |  |  |
| State/Local LGBT+ remedy index | 678 | 2.623 | 679 | 2.608 | 1357 | 0.015 |
|  |  | (0.037) |  | (0.036) |  |  |
| Homophobia | 680 | 1.715 | 681 | 1.176 | 1358 | -0.884 |
|  |  | (0.033) |  | (0.034) |  |  |
| Party ID | 680 | 1.851 | 683 | 1.890 | 1363 | -0.039 |
|  |  | (0.037) |  | (0.037) |  |  |
| Ideology | 680 | 2.829 | 683 | 2.887 | 1363 | -0.058 |
|  |  | (0.057) |  | (0.060) |  |  |
| Gender | 680 | 1.524 | 683 | 1.530 | 1363 | -0.006 |
|  |  | (0.019) |  | (0.020) |  |  |
| Age | 667 | 48.244 | 673 | 46.999 | 1340 | 1.246 |
|  |  | (0.670) |  | (0.667) |  |  |
| Education | 680 | 3.143 | 681 | 3.175 | 1361 | -0.032 |
|  |  | (0.043) |  | (0.041) |  |  |
| Income | 654 | 3.263 | 653 | 3.363 | 1307 | -0.100 |
|  |  | (0.065) |  | (0.068) |  |  |
| Evangelical | 680 | 0.351 | 683 | 0.324 | 1363 | 0.028 |
|  |  | (0.018) |  | (0.018) |  |  |
| Race | 680 | 2.128 | 683 | 2.124 | 1363 | 0.003 |
|  |  | (0.033) |  | (0.034) |  |  |
| Latino | 680 | 0.126 | 683 | 0.113 | 1363 | 0.014 |
|  |  | (0.013) |  | (0.012) |  |  |
| Region | 680 | 2.676 | 683 | 2.659 | 1363 | 0.018 |
|  |  | (0.036) |  | (0.036) |  |  |
| Rural | 680 | 4.803 | 683 | 5.064 | 1363 | -0.261\* |
|  |  | (0.103) |  | (0.101) |  |  |

\*p<0.10 Note: well-balanced samples across treatment and control groups.

# Appendix Figure 1. National, State, Local LGBT+ Rights (ATE)

Our initial pre-registered design with EGAP hypothesized that priming on transgender rights issues like sports could have a negative effect on broader support for LGBT+ rights. Our reasoning was motivated by conservative efforts to mobilize voters on such contentious issues as transgender access to public restrooms and participation in sports. We inquired whether anti-transgender mobilization could have negative spillover effects on public support for the broader LGBT+ community. Here, we are happy to have been in the wrong in our predictions. Priming on transgender rights does not reduce public support for the broader LGBT+ rights movement, as indicated in the figure below. We do not observe significant treatment effects in terms of support for LGBT+ rights remedies when priming on transgender issues first. In other words, the responses given to preferences about how to approach LGBT+ were not conditional to the treatment. Respondents tend to prefer supreme-court strategies for dealing with LGBT+ rights somewhat more than congressional strategies. However, national approaches are favored more than state/local approaches. Our results are encouraging in that superordinate LGBT+ rights framings have a positive impact on boosting transgender support without any negative consequences for public support of broader LGBT+ rights activism. It’s a win-win for the LGBT+ community and the transgender subgroup. It also suggests that conservative scare tactics surrounding transgender rights are not undermining broader LGBT+ support. Again, if we could choose a pre-registered hypothesis to reject, this is it.



# Appendix Table 3a. National LGBT+ Rights Remedy Index Construction



Note: Above are the results of factor analysis on support for LGBT+ rights remedies from Congress and the Supreme Court, which align on a single latent dimension. We compute an alpha index using the interim correlations Cronbach’s Alpha = 0.77

# Appendix Table 3b. State/Local LGBT+ Rights Remedy Index Construction



Note: Above are the results of factor analysis on support for LGBT+ rights remedies at the State and Local Level, which align on a single latent dimension. We compute an alpha index using the interim correlations Cronbach’s Alpha = 0.87.

# Appendix Table 4. LGBT+ Rights Average Treatment Effects (Logit Regression)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DV=Support for Inclusive Transgender Rights | (1) | (2) | (3) |  | (4) |
|  |  |  |  |  |  |
| Baseline Comparison: Control Group |  |  |  |  |  |
| LGBT+ Rights Treatment Group | 0.401\*\*\* | 0.419\*\*\* | 0.379\*\*\* |  | 1.045\*\*\* |
|  | (0.114) | (0.118) | (0.132) |  | (0.294) |
| Homophobia (baseline low) |  |  |  |  | 0.170 |
|  |  |  |  |  | (0.113) |
| Homophobia x LGBT+ Rights Treatment |  |  |  |  | -0.388\*\* |
|  |  |  |  |  | (0.156) |
| Support national legal remedies |  | 0.368\*\*\* | 0.249\*\*\* |  | 0.238\*\*\* |
|  |  | (0.0745) | (0.0881) |  | (0.0918) |
| Support state/local legal remedies |  | -0.398\*\*\* | -0.340\*\*\* |  | -0.342\*\*\* |
|  |  | (0.0621) | (0.0719) |  | (0.0724) |
| Baseline Comparison Group: Democrats |  |  |  |  |  |
| Republican |  |  | -0.850\*\*\* |  | -0.856\*\*\* |
|  |  |  | (0.185) |  | (0.186) |
| Independent |  |  | -0.456\*\* |  | -0.466\*\* |
|  |  |  | (0.182) |  | (0.183) |
| Baseline Comparison Group: Very Conservative |  |  |  |  |  |
| Somewhat Conservative |  |  | 0.132 |  | 0.111 |
|  |  |  | (0.236) |  | (0.239) |
| Moderate |  |  | 0.548\*\*\* |  | 0.561\*\*\* |
|  |  |  | (0.204) |  | (0.206) |
| Somewhat Liberal |  |  | 0.504\*\* |  | 0.522\*\* |
|  |  |  | (0.256) |  | (0.258) |
| Very Liberal |  |  | 0.822\*\*\* |  | 0.841\*\*\* |
|  |  |  | (0.244) |  | (0.247) |
| Baseline Comparison Group: Men |  |  |  |  |  |
| Women |  |  | 0.360\*\*\* |  | 0.356\*\* |
|  |  |  | (0.137) |  | (0.139) |
| Nonbinary |  |  | perfectly |  | perfectly |
|  |  |  | predicts 1 |  | predicts 1 |
| Age |  |  | -0.00898\*\* |  | -0.00924\*\* |
|  |  |  | (0.00431) |  | (0.00446) |
| Education |  |  | 0.0421 |  | 0.0469 |
|  |  |  | (0.0735) |  | (0.0741) |
| Household Income |  |  | -0.0723 |  | -0.0713 |
|  |  |  | (0.0474) |  | (0.0477) |
| Evangelicals |  |  | -0.682\*\*\* |  | -0.674\*\*\* |
|  |  |  | (0.158) |  | (0.159) |
| Baseline Comparison Group: White |  |  |  |  |  |
| African-American |  |  | 0.292 |  | 0.301 |
|  |  |  | (0.217) |  | (0.220) |
| Native-American |  |  | -0.00197 |  | 0.0316 |
|  |  |  | (0.469) |  | (0.474) |
| Asian |  |  | -0.0650 |  | -0.0646 |
|  |  |  | (0.297) |  | (0.298) |
| Mixed-Race/Ethnicity |  |  | 1.336\*\* |  | 1.337\*\* |
|  |  |  | (0.540) |  | (0.529) |
| Other/Unsure |  |  | 0.0592 |  | 0.0747 |
|  |  |  | (0.771) |  | (0.740) |
| Latino |  |  | 0.131 |  | 0.139 |
|  |  |  | (0.208) |  | (0.208) |
| Baseline Comparison Group: North |  |  |  |  |  |
| Midwest |  |  | -0.0898 |  | -0.0949 |
|  |  |  | (0.226) |  | (0.229) |
| South |  |  | -0.0765 |  | -0.0852 |
|  |  |  | (0.208) |  | (0.210) |
| West |  |  | -0.0696 |  | -0.0655 |
|  |  |  | (0.232) |  | (0.236) |
| Urban-Rural Continuum |  |  | -0.00233 |  | -0.00539 |
|  |  |  | (0.0248) |  | (0.0248) |
| Constant | -0.826\*\*\* | -0.926\*\*\* | -0.207 |  | -0.452 |
|  | (0.0834) | (0.274) | (0.583) |  | (0.662) |
|  |  |  |  |  |  |
| Observations | 1,363 | 1,357 | 1,221 |  | 1,218 |
| Log Likelihood | -876.2 | -843.8 | -685.4 |  | -680.8 |
| adj. r2 | 0.00703 | 0.0396 | 0.123 |  | 0.126 |
| Mean VIF | 1.00 | 1.02 | 1.39 |  | 4.52 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# Appendix Figure 2. LGBT+ Rights with Ideology Interaction Terms (OLS Regression)



Note: Treatment effects are more pronounced among liberal and conservatives than moderates.

# Appendix Figure 3. Treatment Effects with LGBT+ National Rights Remedies Interaction Terms (OLS Regression)



Note: In the control group, we find no relationship between support for LGBT+ rights at the national level and support for inclusive transgender rights in sports. In the treatment group, we find that people who are more supportive of national remedies to address LGBT+ rights are more supportive of transgender rights than those who are opposed to national remedies.

# Appendix Figure 4. Treatment Effects with State/Local LGBT+ Rights Remedies Interaction Terms (OLS Regression)



Note: Support for inclusive transgender rights declines as preferences for state and local LGBT+ rights remedies increase in both the treatment and control group.

# Power Calculations

Given our sample size of 1366 and randomization into 2 groups with equal probability of allocation into each group (1:1), we compute the following effect sizes for alpha of 0.05 and power ranging from 0.80 to 0.99. In the table below we run power calculations with one-way ANOVA. Delta is the effect size, while Var\_m is the between-group variance. For a power of 0.80 (if the effect exists, there is an 80% chance of detecting a true positive) and alpha of 0.05 (if the effect does not exist, there is a 5% chance of detecting a false positive), the minimum detectible effect size for delta is 0.076. Our actual Cohen’s d for the treatment vs. control group effect size is 0.19, which indicates that we have sufficient power to avoid either Type 1 or Type II errors. In general, a delta of 0.20 is a common benchmark for relatively small treatment effects, 0.35 for medium-sized effects, and 0.50 for larger effects (Cohen 1988).

Effect Size Estimations using One-War ANOVA (Sample Size)



Finally, we take into consideration sample size and effect size estimation for the interaction term between our treatment/control groups and party identification. The table below shows the distribution of respondents by party ID across treatment and control groups. Responses are generally well distributed across treatment and control groups (Pearson’s Chi-Squared = 0.66, p<0.72).

Distribution of Respondents by Party ID Moderator and Treatment Groups.



In the table below, we run a Two-Way ANOVA where the dependent variable is support for inclusive transgender participation in sports and the independent variables include the treatment groups, the party id moderator, and the interaction between the treatment and party id moderator variables. From this model, we derive the variance around the error term to be 0.21. We use this information to estimate the minimum detectible effect size and sample size for the moderated effect of the treatment.

Table. Two-Way ANOVA Estimation of Treatment Effects with Moderation.



The table below shows the estimated minimum detectible effect size for equally distributed data with a sample size of 1314, distributed across a treatment variable with 2 rows, a moderator variable across 3 columns, and an error variance of 0.21. The minimum detectible effect size is estimated at 0.086 which is comparable to earlier estimates without consideration of the moderator. Our observed treatment effect size is 0.19 overall, and 0.26 for Republicans only, so we are well within the range of detecting moderated treatment effects while avoiding Type I or Type II errors.

Estimates of Minimum Effect Size and Sample Size for Moderated Treatment Effects



References

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Lawrence Erlbaum Associates.

# Sensitivity Analysis

Below we report the results of sensitivity analysis on our main treatment effect using methods developed by Altonji et al. (2005) as well as recent advances by Diegert et al. (2022a-b). We start with the approach by Altonji et al. (2005) which is most familiar. It uses the coefficients from regression models estimating the average treatment effect with and without covariate conditioning to assess how much greater the influence of unobservable factors would need to be, relative to observable factors, to explain away treatment effects. The ratio is calculated as βf/[ βr-βf] where βf is the full model with conditioning on covariates and βr is the restricted model without conditioning. The smaller the difference in the coefficients, the less the difference is affected by selection on observables, which means the larger the selection on unobservables needs to be relative to observables, to explain away the treatment effect. Using the coefficients from models below without conditioning (Model 1) and with conditioning on all control variables in manuscript Table 1 (Model 2), we estimate the ratio to be 13.2 for the direct effect of the LGBT+ rights treatment which means that the effect of unobservables would need to be 13 times greater than observables to explain away the LGBT+ rights treatment effect, which is unlikely.

Table 1. LGBT+ Rights Framing and Transgender Inclusion in Sports (OLS Regression)

|  |  |  |
| --- | --- | --- |
| DV=Support for Inclusive Transgender Rights | (1) | (2) |
|  |  |  |
| Baseline Comparison: Control Group |  |  |
| LGBT+ Rights Treatment Group | 0.0909\*\*\* | 0.0845\*\*\* |
|  | (0.0257) | (0.0249) |
| Constant | 0.304\*\*\* | 0.480\*\*\* |
|  | (0.0177) | (0.116) |
|  |  |  |
| Observations | 1,363 | 1,279 |
| R-squared | 0.009 | 0.157 |
| adj. r2 | 0.00835 | 0.137 |
| Mean VIF | 1.00 | 1.38 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Next, we utilize Diegert, Master, and Poirier’s (2022) and Oster’s (2019) approaches with the same covariates and the **regsensitivity** package in STATA. We start with DMP, which estimates the sensitivity parameter using the ratio of selection on unobservables to observables (rxbar), where rx=1 is a natural reference point for “equal selection” while rx<1 means observables are more important than unobservables (1/2 = 0.5 would mean observables are twice as important as unobserved variables). However DPM (2022 p. 30) notes that “the interpretation of this reference point depends on the choice of covariates that we calibrate against. Put differently, when we say that we compare “selection on unobservables to selection on observables,” which observables do we mean?” Importantly, DMP (2022, p. 31) indicate that “the value of using relative sensitivity parameters like ¯rX is not that they allow us to obtain a universal threshold for what is or is not a robust result.”

Using STATA’s **regsensitivity** with control covariates for gender, age, education, income, employment, religion, and ethnicity the DMP sensitivity parameter rxbar is estimated as follows in the table and figure below. The breakdown point is 51.1% meaning that our LGBT+ rights treatment effect is greater than zero (β > 0) as long as selection on unobservables is no more than 51.1% as large as selection on observables. A much more concerning breakdown point might be 3 or 6%, which would mean that selection on unobservables would only need to be at least 3 to 6% as large as selection on observables to overturn our conclusion that β > 0. For our study, this is generally a positive sign for the robustness of our results.



We see similar results from sensitivity analysis in the LGBT+ rights treatment conditioning on the same covariates using the Oster (2019) method. The breakdown point is 160% meaning that our policing treatment effect is greater than zero (β > 0) as long as selection on unobservables is no more than 160% as large as selection on observables.

**References**

Abadie, Alberto, and Guido W. Imbens. "Matching on the estimated propensity score." *Econometrica* 84, no. 2 (2016): 781-807.

Altonji, Joseph G., Todd E. Elder, and Christopher R. Taber. "Selection on observed and unobserved variables: Assessing the effectiveness of Catholic schools." *Journal of Political Economy* 113, no. 1 (2005): 151-184.

Diegert, Paul, Matthew A. Masten, and Alexandre Poirier. "Assessing omitted variable bias when the controls are endogenous." *arXiv preprint arXiv:2206.02303* (2022).

Diegert, Paul, Matthew Masten, and Alexandre Poirier. "REGSENSITIVITY: Stata module for regression sensitivity analysis." (2022).

Gerber, Alan S., and Donald P. Green. 2012. *Field Experiments: Design, Analysis, and Interpretation*. W.W. Norton.

# Further Discussion of Superordinate Identity Theory

Superordinate identity effects may be contingent on a number of factors. When groups disagree about one another’s relative prototypicality, value, status, and or regard one another as a potential threat, then superordinate categorization can sometimes trigger intergroup conflict and discrimination (Jetten and Spears, 2003). For example, appeals to a common cultural identity or civic identity may potentially inflame prejudices against outgroups if people do not accept each other as prototypical members of the superordinate category. Appeals to a common identity have also been shown to stifle subgroup demands for collective action, including in LGBT+ contexts (Górska and Bilewicz 2015).

Górska, Paulina, and Michał Bilewicz. “When “a group in itself” becomes “a group for itself”: Overcoming inhibitory effects of superordinate categorization on LGBTQ individuals.” Journal of Social Issues 71, no. 3 (2015): 554-575.

Jetten, Jolanda, and Russell Spears. “The divisive potential of differences and similarities: The role of intergroup distinctiveness in intergroup differentiation.” European review of social psychology 14, no. 1 (2003): 203-241.

# **Report on applied experimental standards for manuscript:**

Increasing Public Support for Transgender Rights through Superordinate LGBT+ Rights Framing: Evidence from a U.S. Survey Experiment on Transgender Participation in Sports

**A. Hypotheses**

* Specific objectives or hypotheses:   
  *H1. (Superordinate Identity Framing). Public support for Transgender subgroup rights increases when first framed in the context of LGBT+ group rights.*
* **B. Subjects and Context**
* Eligibility and exclusion criteria for participants.

Participants below the age of 18 years at the time of participation were not eligible. There were no changes of exclusion criteria after recruitment began.

* Procedures used to recruit and select participants.
* Recruitment dates defining the periods of recruitment and when the experiments were conducted.

A total of 1366 respondents completed our survey between May 19-25, 2021. No repeat measures or follow-ups.

* Settings and locations where the data were collected.

Data collection took place using online survey participants in the United States

* If there is a survey: Provide response rate and how it was calculated.
* Refused to start: 121
* Accepted Starts: 3138
* Refusals after start: 28
* Drops during surveys: 468
* Screen outs: 188
* Response rate = 1366/3259 = 42% (of those who were contacted to participate and initiated the process to complete the survey).

**C. Allocation Method**

* Details of the procedure used to generate the assignment sequence (e.g., randomization procedures).
* If random assignment used, then details of procedure (e.g., any restrictions, blocking). If random assignment used, provide evidence of random assignment.

Assignment to treatment was randomized by computer algorithm via Qualtrics. Balance tests are provided in the appendix showing clear evidence of random assignment.

* Blinding: Were participants, those administering the interventions, and those assessing the outcomes unaware of condition assignments?

Participants were unaware of their assignment to interventions. There were no active administrators during the experiment.

**D. Treatments**

* Description of the interventions in each treatment condition, as well as a description of the control group.

Respondents in the treatment group received items related to broader LGBT+ Rights followed by a transgender sports vignette. The control group received the reverse sequence of questions (transgender sports first followed by broader LGBT+ rights).

* How and when manipulations or interventions were administered.

Treatments were randomized via Qualtrics.

**E. Results**

* 1. Outcome Measures and Covariates

Below are the main items:

(Transgender Rights Experiment)

Group A – receives transgender sports vignette first, then LGBT rights questions.

Group B – LGBT rights, then transgender sports vignette

(Sports) As of 2020, there are no federal laws regulating transgender athletes in sports, and state laws vary widely for whether athletes can compete in sports based on their self-identified gender or their assigned gender at birth. Which statement best captures your views on the issue of transgender athletes in sports?

Transgender athletes must compete in sports according to their gender assigned at birth OR Transgender athletes should be allowed to compete in sports according to their self-identified gender (Randomized response order)

How do you think LGBT rights should be addressed legally? (strongly agree – strongly disagree)

Congress needs to enact a uniform set of national legal protections

The Supreme Court needs to make clear what rights are/are not protected under the Constitution

Let each state decide what’s best for them

Let each local community decide what’s best for them

(Randomized Response Order)

2. CONSORT Participant Flow diagram

Please check last page for a flow diagram.

3. Statistical Analysis

For the statistical analysis cases were only deleted where information on socioeconomic covariates was missing (i.e. the survey item was not completed). There are no particular effects of assignment/treatment or missing information on outcome variables.

Missing data are reported as percentages on all variables in the SI. No specific ITT analysis has been conducted. No weighting procedures were applied in the survey data.

**F. Other Information**

* Was the experiment reviewed and approved by an IRB?

Yes, by the IRB at ### University

* What was the source of funding? What was the role of the funders in the analysis of the experiment?

Funding was provided by departmental research development funds from ### University.

* Were there any restrictions or arrangements regarding what findings could be published? Any funding sources where conflict of interest might reasonably be an issue?

There were no restrictions about publishing findings from the side of the funders. The authors do not see any potential conflict of interest.

**CONSORT Flow Diagram (Based on randomization in first dictator game)**

## Enrollment

Analysed (n= 680)  
Excluded from regression analysis because of missing covariate information (n= 0 in the bivariate model)

Allocated to Control (n= 680)

 Received allocated intervention

 Did not receive allocated intervention (give reasons) (n= 0 )

## Analysis

## Allocation

Assessed for eligibility (n ≈ 3259)

Excluded (n= 0)

  Not meeting inclusion criteria of adulthood (n= 0)

  Declined to participate (n= 149)

  Other reasons (n= 1744 due to dropouts or screenouts)

Randomized (n= 1363)

Analysed (n= 683 )  
 Excluded from regression analysis because of missing covariate information (n= 0 in the bivariate model )

Allocated to Intervention 1 (n= 683)

 Received allocated intervention

 Did not receive allocated intervention (give reasons) (n= 0 )