Impact of Policy Change on Transgender Attitudes in the United States

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Abstract

Using Transgender IAT data from 2021 and 2022, this work investigates the relationship between a selection of newly enacted local anti-transgender legislation in the United States and its effects on the implicit and explicit attitudes of citizens that reside in or outside of the states that passed such laws. Results showed that the enactment of state-level legislation restricting transgender rights did not influence citizens' implicit or explicit transgender attitudes, regardless of their state of residence. This study is an important advance in research on how area-level outcomes relate to individuals' prejudices and expands on prior studies by looking at how legislation influences attitudes in a new domain. These findings also add to the accumulating mixed evidence concerning the role of government legislation and social norms on intergroup bias, as well as the stability of personal attitudes related to topics of gender identity.

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There is a growing body of research that highlights the role of public policy in shaping attitudes about various topics. These attitudes can be split into two related, but distinct constructs. There is a considerable amount of research on the first construct, explicit attitudes, which reflect relatively conscious mental processes and are assessed using direct measures like self-report (Greenwald & Banaji, 1995). While explicit attitudes often predict behavior (Dovidio et al., 2002), these self-reported measurements do not fully explain the types of attitudes people may hold. Implicit attitudes, the second construct, reflect more automatic associations and are measured using more indirect methods that infer attitudes from behavioral responses (Greenwald & Banaji, 1995).

The Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) measures implicit attitudes by measuring the reaction time needed to associate concepts with one another, such that shorter reaction times indicate concepts that are more frequently activated together, whereas longer reaction times indicate concepts that are less frequently activated together. Thus, the IAT procedure involves a series of tasks where associations are made between a target label and either positive or negative attributes. For example, in one block of the Race IAT, a right-hand key would be associated with both positive attributes and images of Black individuals, whereas a left-hand key would be associated with negative attributes and images of White individuals. It is important to note that the stimuli that is associated with either key varies across trials. Participants would be presented with a single stimulus in the middle of their computer screen, consisting of either an image of a Black individual, an image of a White individual, a pleasant word or an unpleasant word in a randomized sequence. Their task would then be to sort the stimuli as quickly as possible by pressing on the appropriate key.

These implicit attitudes are sensitive to one's sociocultural context (Axt et al., 2014), and hence, laws or public policies may be used by citizens to infer social norms. A recent example of such influence has been studied by Crandall et al. (2018) where they found an increase in prejudice towards marginalized groups, like Muslims or immigrants, following the 2016 US election of President Donald Trump and his notoriously strong opinions against immigration, evidenced by his administration's efforts to end DACA, a policy protecting children who were brought into the country as unlawful residents, from deportation. Race and racism is a different but equally current issue, especially with the rise of the *Black Lives Matter* movement. In 2013, 87% of Americans approved of Black-White marriages compared to just 4% in 1958 (Newport, 2013). Interracial marriage was legalized by the US Supreme Court in 1978, and it is certainly not just coincidence that attitudes before and after this key ruling have changed. This suggests that people may be looking to such laws as an avenue to change their attitudes, rather that the contrary, where novel legislation would be introduced as a result of prior changes in individual attitudes.

The influence of social norms on attitudes

As mentioned previously, citizens may be looking towards legislation to infer social norms, and similarly, prior research also provides precedent that salient events in society may impact attitudes. One example of how real-world events can shape implicit attitudes is work by Ravary et al. (2019) that investigated attitude changes in response to shifts in the sociocultural environment. Results demonstrated that participants had more negative implicit anti-fat attitudes after public celebrity fat-shaming events, and that this effect was mediated by the notoriety of the event, such that more popular events produced larger effect sizes. Likewise, Sawyer and Gampa, (2018) found that implicit pro-White racial biases were lower during the *Black Lives Matter*

movement as opposed to prior, and decreased over time during the movement. As for explicit attitudes, both Black and White individuals became less biased during the *BLM* movement, such that they both adopted a more egalitarian position (i.e., lower pro-White attitudes for White individuals and lower pro-Black attitudes for Black individuals). These examples point to the impact of popular sociocultural events on attitudes, as may also be the case for legislation.

In a democratic country like the United States, the law should reflect the interest of the majority and therefore explains why policy is perceived as the norm. However, politics are much more complicated than that and the decisions that are made by a select few of elected representatives may not always accurately represent the general population. In other words, changes in individual attitudes may create new legislation, but the reverse may also be true: new legislation may also change individual attitudes because such legislation is seen as reflecting changes in social norms and values.

However, while research has shown that humans are social beings who rely on social norms, such as current policies, to inform their own beliefs and attitudes (Latané, 1981), there is more mixed evidence regarding the impact of legislation on attitudes when it comes to topics of gender identity and sexuality. Ofosu et al. (2019) found that anti-gay implicit and explicit attitudes decreased following the legalization of same-sex marriage in the US. The quasi-experimental, multi-group, interrupted time series methodology that was used by the researchers reinforces the causal relationship between legalization and attitudes and suggests that decreases in anti-gay attitudes occurred as a consequence of US states legalizing same-sex marriage. The current study looks to expand our understanding of the impact of legislation on attitudes into a very salient domain: gender identity.

Attitudes towards transgender people

More people are coming out as transgender in the modern era than ever before (Brown, 2022) and the anti-transgender violence that has ensued, as well as the laws participation in restricting these human rights in recent years, have sparked interest in research on transgender attitudes and the law.

In terms of implicit attitudes, the Transgender IAT is one of the most recently developed IATs in psychological research. Specifically, the task measures automatic associations between images of cisgender and transgender celebrities and positive and negative words. The Transgender IAT was found to show predictive validity and internal reliability (Axt et al., 2020) which allows for future research on the study of implicit attitudes towards transgender people, including the ways in which these attitudes may be shaped by government legislation.

Following from past research on how legislation shapes attitudes, this study looks to investigate if anti-transgender legislation has similar effects on attitudes in a present context that seems to be becoming increasingly dangerous for publicly identifying transgender individuals. Specifically, this wave of anti-transgender legislation has occurred in parallel with 57 American transgender or gender non-conforming fatalities recorded in 2021, compared to 44 transgender or gender non-conforming fatalities by violent means in 2020, according to the Human Rights Campaign (https://www.hrc.org/).

Because of the relatively recent spotlight on transgender rights in the United States, little is known about the relationship between the anti-transgender policies that have been enacted in the last two years and the rise of discrimination against transgender individuals.

The Present Work

Although the exact number of transgender individuals in the United States is unknown, a meta-analysis of public survey data estimates that as of 2016, approximately 1 million

Americans over the age of 18 publicly identify as transgender (Meerwijk & Sevelius, 2017).

Higher numbers of transgender people are likely to be observed as time goes on and

consequently, it is urgent that prejudice and discrimination based on gender-identity be well-

understood to mitigate its future consequences. The current research comes at a time of

increasing violence against the transgender community and focuses on how local policy may be

influencing the American citizens' transgender implicit and explicit attitudes. Specifically, we

identify state-level anti-transgender bills passed in 2021 and 2022 and examine how enacting

these laws may have changed implicit and explicit transgender attitudes, collected through the

Transgender IAT developed by Axt et al. (2020), around specific points in time at which these

policies were enacted. In addition, we also present a meta-analysis across effects to provide the

most accurate estimate of the effect of anti-transgender legislation on individual attitudes. Prior

research has examined legislation and its relationship with attitudes in domains of sexual

orientation and weight (e.g., Ofosu et al., 2019; Ravary et al., 2019). This study furthers that

work to another area of research in intergroup relationships. Below, we detail the specific

procedure that we used to select the policies and samples that were included in the analysis.

Methods

Participants

Participants were individuals who accessed the Transgender IAT from January 2021 to

October 1st, 2022, through the public website, Project Implicit (https://implicit.harvard.edu).

Since this study focuses on how state-level anti-transgender policies influence the transgender

attitudes of American citizens, only participants living in the US, from one of the 50 states plus

District of Columbia and the 5 populated American territories (American Samoa, Guam,

Northern Mariana Islands, Puerto Rico and the Virgin Islands) were retained for analysis.

A total of 405,297 session ID codes were created for participants who accessed the Transgender IAT through Project Implicit between January 1st, 2021, and October 1st, 2022. Of these participants, 39.6% ($N = 160,481$) completed the study while residing in the US.

US participants who had completed the Transgender IAT within a 2-week period prior or following the enactment of one of the 12 state-level anti-transgender policies identified were retained for analysis. As such, in 2021, participants who were retained for analysis completed the Transgender IAT between March 30th and June 4th, and those retained for analysis in 2022 completed the IAT between March 15th and June 14th. A total of 39,668 eligible American participants were included in the analyses. Across tests, sample sizes vary due to missing data.

The enactment of all anti-transgender legislation occurred within 2-weeks of the preceding policy within each year due to similarities in legislation schedules, causing the 2-week periods prior or following the enactment of subsequent state-level policies to overlap with each other. Participants were grouped with regards to the state in which a policy had been enacted, as either belonging to the state where the policy had been enacted (*in-state*) or as belonging to a state that did not enact any anti-transgender policies within that same year (*out-of-state*). For example, House Bill 1570 was passed in Arkansas in 2021. Subsequent anti-transgender policies were enacted in both Montana and Tennessee within the same year. Citizens of Arkansas who completed the Transgender IAT during the 2-week periods prior or following the enactment of House Bill 1570 were considered *in-state* participants, while citizens from District of Columbia, the 5 populated American territories and all states other than Montana and Tennessee who completed the assessment during that same time period, were considered *out-of-state* participants.

Measures

Implicit transgender attitudes. Implicit attitudes were assessed using the Transgender IAT developed by Axt et al. (2020) with a series of seven tasks. Participants were shown attributes that were either pleasant words (e.g. "Nice, "Pleasure", etc.) or unpleasant words (e.g. "Nasty", "Agony", etc.). The stimuli that participants were asked to categorize consisted of images of either cisgender or transgender celebrities (four cisgender and four transgender for a total of eight images). To control for confounds, pairs of cisgender-transgender celebrities were matched on age, race and popularity (estimated using Google search returns). Participants first performed a 24-trial training block during which they had to correctly identify the individual as cisgender or transgender, after being presented with short descriptions for each of these celebrities. Images labeled as cisgender or transgender during the initial training block were removed for the assessment blocks.

The seven blocks of the IAT were administered following the procedure defined in Nosek et al. (2007). The strength and direction of the implicit associations were calculated using the *D* algorithm (Greenwald et al., 2003), which was scored such that higher values meant more positive implicit associations towards cisgender people compared to transgender people. Participants were removed from analysis involving the IAT if more than 10% of critical trials were faster than 300 ms (Axt et al., 2020).

Explicit transgender attitudes. Participants completed a relative preference item concerning explicit attitudes towards cisgender vs. transgender people (Axt, 2017). The 7-point response scale ranged from +1 ("I strongly prefer transgender people to cisgender people") to +7 ("I strongly prefer cisgender people to transgender people").

Anti-transgender legislation. Anti-transgender bills discussed in 2021 and 2022 were identified by the Trans Legislation Tracker (https://www.tracktranslegislation.com/), a data

visualization tool that seeks to track all anti-transgender bills that have been discussed in the United States since January 2021. The website draws from data sourced from LegiScan API (https://legiscan.com/legiscan), TransAthlete.com, and pro-LGBTQ2A+ advocacy groups: National Center for Transgender Equality (https://transequality.org/2021-state-action-center), American Civil Liberties Union (ACLU), the Human Rights Campaign (HRC), and Freedom for All Americans (FFAA).

This study examines how anti-transgender legislation influences citizens' transgender attitudes and thus, bills that have been signed into law were used for analysis because comparison of possible shifts in transgender attitudes could be done around a clearly identifiable date. All bills relating to youth athletics, such as the right of a transgender girl to play on a girl's sports team, were excluded in an effort to focus on legislation that affects the treatment of all transgender people rather than a subset of transgender youth. Senate Bill 1100, for example, prohibits nonbinary gender designation on birth certificates in the state of Oklahoma. Since the Trans Legislation Tracker is specific to the US states, we conducted a Google search to check for additional state-level anti-transgender legislation that was passed in 2021 or 2022 in the 5 populated American territories and District of Columbia. No such bills were found.

The final list of anti-transgender bills that were signed into law in 2021 or 2022 contained 12 House and/or Senate Bills. The domains covered by these bills that restrict transgender rights at the state-level are diverse, ranging from healthcare to public facilities to school curriculum to ID updates to religious freedom. In 2021, anti-transgender legislation was enacted in the states of Arkansas, Montana and Tennessee. In 2022, such legislation was passed in Florida, Arizona, Alabama, Oklahoma and Louisiana. Detailed descriptions of each of these 12 bills can be found in Table 1.

Procedures

Measures of implicit attitudes (Transgender IAT) and explicit attitudes (self-report scale) were completed in random order by all participants. The 2021 Transgender IAT data was made available to the public through the OSF (https://osf.io/fb29q/), from where it was retrieved. The January-October 2022 Transgender IAT data was provided by Dr. Jordan Axt, thesis supervisor and Director of Data and Methodology for Project Implicit. All state-level anti-transgender legislation that was signed into law from January 2021 to October 2022 was identified via the various sources outlined in the previous section. All state-level anti-transgender laws unrelated to youth athletic bans were subsequently selected for inclusion in this study.

Results

The influence of state-level legislation on implicit and explicit transgender attitudes was determined by comparing citizens' attitudes two weeks before and two weeks after a policy had been enacted, following the same timeframe that was used to examine anti-fat attitudes around public celebrity fat-shaming events in Ravary et al. (2019). To distinguish this from an overall change in transgender attitudes unrelated to the changes in policy (i.e., global shifts in transgender attitudes that were not related to the passing of anti-transgender legislation), attitudes of citizens living within the state where such a bill had been signed into law were compared with attitudes of US residents from other states. Each state-level effect was run individually, but results were also meta-analyzed. Individual independent sample t-test results for each of the 12 anti-transgender bills can be found in Tables 2-5. Across a combined total of 48 tests, only one individual test showed a statistically significant effect, which was the decrease in explicit anti-transgender attitudes among *out-of-state* participants following the enactment of House Bill 2161 in Arizona ($p = 0.004$). Across all four meta-analyses, only one showed a statistically significant

effect, such that explicit anti-transgender attitudes of US citizens living outside states where anti-transgender bills had been passed decreased following policy enactment, although the p-value was not robust ($p = 0.050$).

Effect of Legislation on Implicit Transgender Attitudes

Independent sample t-tests were conducted and meta-analyzed to compare Transgender IAT *D*-scores two weeks prior to a state-level anti-transgender bill being signed into law, *pre-policy*, with Transgender IAT *D*-scores two weeks after a state-level anti-transgender bill was signed and enacted, *post-policy*. Results showed no significant effect of policy group on Transgender IAT *D*-scores, $g = -0.076$, 95% CI [-0.210, -0.058], $p = 0.264$ (see Table 2) for citizens living within the state where an anti-transgender bill had been signed into law. Our analyses also showed no change between Transgender IAT *D*-scores obtained from US citizens living outside the states where anti-transgender bills had been passed and enacted, *pre-policy* vs. *post-policy*, $g = 0.016$, 95% CI [-0.0004, 0.031], $p = 0.056$ (see Table 3), though this effect did nearly reach statistical significance. These results indicate a slight decrease in implicit anti-transgender attitudes following the enactment of state-level anti-transgender policy in *out-of-state* participants, compared to the two-week period prior to these bills being signed into law.

Effect of Legislation on Explicit Transgender Attitudes

A meta-analysis aggregating all independent sample t-tests comparing results from a relative preference item concerning explicit attitudes towards cisgender vs. transgender people showed no change in self-reported anti-transgender attitudes obtained from citizens who reside in the state where an anti-transgender bill had been passed, two-weeks prior vs. two-weeks following it being signed into law, $g = 0.074$, 95% CI [-0.057, -0.205], $p = 0.2695$ (see Table 4). A small, statistically significant effect of policy group on explicit anti-transgender attitudes was

found , $g = 0.016$, 95% CI [0 -0.0312], $p = 0.050$ (see Table 5) for US citizens living outside the states where anti-transgender bills had been passed and enacted, indicating that explicit anti-transgender attitudes actually decreased, following the enactment of anti-transgender legislation, in participants living in areas where such legislation did not occur. However, the effect size of this finding ($g = 0.016$) would be considered very small, and our analyses of *out-of-state* participants alone involved meta-analyzing a series of tests that had over 50,000 scores for the self-report measure. Thus, this statistically significant effect may not be relevant as the large sample sizes may be amplifying the detection of differences (Faber & Fonseca, 2014).

Discussion

Humans are undoubtably aware of the attitudes held by others in their environment (Latané, 1981). Nevertheless, attitude changes in the face of dynamic and rapid changes in government legislation, especially on modern issues relating to gender identity, have seldom been examined. Using publicly available cross-sectional data, we assessed the impact of state-level legislation on transgender attitudes. However, in conflict with some prior research in this area, we found that the enactment of state-level legislation restricting transgender rights was not reliably associated with changes in US citizens' implicit or explicit transgender attitudes, at least within a four-week timeframe.

This work extends the mixed evidence demonstrated by prior research regarding the impact of government legislation on citizens' attitudes, however, its relationship with transgender attitudes specifically was not examined. Some related data on same-sex marriage, that is often subject to similar scrutiny by individuals holding strong political or religious views, has measured warmer attitudes towards homosexual individuals following legalization of same-sex marriage in three US states: California, Washington and Utah (Flores & Barclay, 2015). The

same study found that residents of these states that introduced same-sex marriage policies showed the greatest decrease in explicit anti-gay attitudes, but that these attitude changes occurred prior to legalization. Subsequent research found no change in explicit anti-gay attitudes before and after federal legalization of same-sex marriage on a one-year timeframe (Tankard & Paluck, 2017). Our findings match these results in that no change was found went comparing attitudes on a four-week timeframe around local anti-transgender law enactment. This points to the dynamic and mutual relationship between attitudes and legislation, whereby citizens in states where anti-transgender policy is being passed already hold more negative attitudes, and perhaps, these bills emerge a mere consequence. Future research may benefit from examining transgender attitudes over a longer timeframe preceding and following the enactment of such policies to understand the trend of these attitudes, as these changes in implicit and explicit attitudes may be slowly accumulating over time. More data from the Transgender IAT is currently being collected and therefore such analyses will be possible in the future.

Our implicit attitude data contrasts with the results of the Ofosu et al. (2019) study that credibly argues for the decrease in implicit anti-gay attitudes following the legalization of same-sex marriage in the US with methodology that mitigates threats to causal inference. Similarly, Ravary et al. (2019) found increases in implicit anti-fat attitudes following events of celebrity fat-shaming. It is worth noting that a significant percentage of Project Implicit respondents were likely not aware of the enactment of these new anti-transgender policies since these bills were covered in varying amounts by mainstream media. Same-sex marriage legalization was given a great deal of media coverage, and therefore, it is likely that most participants who completed IATs following the event, were aware of the institutional change. As for events of celebrity fat-shaming, researchers found that the notoriety of the event was associated with effect size

(Ravary et al., 2019), such that the more exposure to an event the general public received, the larger the increase in implicit anti-fat attitudes.

The media coverage, or lack thereof, received by the majority of the anti-transgender bills that we selected for analysis may explain this lack of robust results in the present work. It may simply be that the general population, or even the sample of Project Implicit participants, is not as aware of the changes in policy. Many transgender people are also confused about the status of state and federal legislation when it comes to transgender rights. Indeed, 27.2% of transgender adults living in the Northeastern US did not know whether their state legislation prohibited against hate crimes based on gender identity and 2.1% of these transgender participants incorrectly stated that their states did not (Hughto et al., 2021). Presumably, cisgender individuals would be similarly uncertain, if not more, about legislation that does not directly target their own rights. To assess the knowledge of citizens with regards to novel policies, subsequent research could explicitly ask individuals if they are aware of whether or not anti-transgender legislation has been passed in their area before measuring their anti-transgender attitudes. Similarly, the notoriety of a bill could be estimated with Google search returns, such that more returns indicate a more highly publicised bill and therefore greater awareness of the policy in the general population.

Even though the social norms signaled by the institutions surrounding citizens are changing, the notion that discrimination is a problem is still overarchingly present in the American society (Murray, 2021). An alternative explanation to the lack of change in explicit attitudes following the enactment of new anti-transgender legislation could speak to the power of the social desirability bias. Explicit attitudes are more conscious and easier to control, and thus, participants tend to answer self-report measures of transgender attitudes in a more socially

acceptable way (Kim & Kim, 2013). However, all groups showed a slight, but clear bias against transgender people in the self-report measures of explicit attitudes, suggesting that social desirability bias may not be a key factor in the present study. All in all, both findings for implicit and explicit measures of anti-transgender attitudes, in citizens residing in and outside of the states that anti-transgender legislation was passed in, provided very similar results of unchanged attitudes before and after such legislation, suggesting the strength of the null effect.

Limitations

A number of important limitations need to be considered when concluding on the above findings. Firstly, Project Implicit participants tend to be disproportionately educated and politically liberal (Xu, Nosek, & Greenwald, 2014). This may limit the generalizability of our findings, as the sample may not be an accurate representation of the general population.

Additionally, it should be noted that the present study looks solely at legislation restricting transgender rights in the United States and does not take the laws that expanded transgender rights in the same timeframe into consideration. The latter would parallel the Ofosu et al. (2019) study that examined that effect of legislation on anti-gay biases when expanding same-sex marriage rights. Legislation expanding transgender rights may be pushing citizens towards more positive transgender attitudes, which could be compensating for the effects of anti-transgender legislation. We focus on anti-transgender legislation that was enacted and do not look at bills that were either introduced and are still in discussion, or at bills that were introduced and died in Congress. In 2022 alone, of the 36 different American states that had proposed anti-transgender bills, most of which are still in progress according to the Trans Legislation Tracker (https://www.tracktranslegislation.com/), the present study looks at the five states that actually enacted these anti-transgender policies, but not at the 13 other state-level anti-transgender bills

that died in committee. It may be that government legislation has greater influence on attitudes when a bill is first introduced as a potential law, and that its influence is less at the time of enactment, as the signing of the policy into law may simply be seen as a formality. Future research would be needed to examine anti-transgender attitudes around this distinct timepoint in the legislative process.

Finally, this study is correlational and thus, causality between attitudes and legislation cannot be inferred. As mentioned previously, it is unclear whether enactment of novel anti-transgender policy precedes or follows increased anti-transgender attitudes in affected states. It is also important to mention that anti-transgender legislation was only passed in eight of the 50 US states in 2021 and 2022, and therefore limits our analysis to this subset of the American population. Specific unrelated characteristics of these populations may also be influencing the results rather then the legislation itself, again limiting the generalizability of our results to the entirety of the US population. Relatedly, this study is cross-sectional rather than longitudinal, in that data was collected around a specific point in time and does not compare the same participants before and after the enactment of legislation. Therefore, it is possible that changes in attitudes exist, but cannot be detected by the present study because different types of participants choose to complete the Transgender IAT before and after such legislation is enacted. Future research could address this question with a longitudinal approach, whereby the anti-transgender attitudes of the same participants would be measured before and after such legislation is passed.

In conclusion, state-level anti-transgender legislation does not have a significant relationship with changes in citizens' implicit or explicit attitudes, regardless of if they live in the state where such laws have been passed or outside of those states. Institutional decisions that signal changes in social norms may not be strongly associated with citizens' individual attitudes

in the short-term, especially when it comes to legislation regarding the LGBTQ2A+ community. This contrasts with previous research regarding same-sex marriage and its legalization contributing to more positive attitudes in American citizens (Ofosu et al., 2019), and adds to the existing mixed evidence regarding the effects of laws on bias by expanding these conclusions to transgender attitudes.

Our findings support the conclusion that attitudes towards gender nonconforming individuals are particularly difficult to change, perhaps due to strong religious or political views (Jost et al., 2009). However, the rise in anti-transgender violence that has paralleled the timeline along which xenophobic attitudes have increased (Crandall et al., 2018) remains to be better understood. As previously mentioned, our lack of findings may be better explained by the lack of awareness of these changes in legislation by citizens, in contrast to Trump's controversial opinions about various minority groups, for example, which were highly publicized. It may be less obvious to citizens that the perceivable attitudes of the majority, represented by the newly enacted legislation, have changed if these policies are seldom covered by mainstream media. Further studies or follow-ups would benefit from controlling for the notoriety of these newly passed bills to better understand how the interaction between legislation and the awareness of novel legislation affects perception of social norms and subsequently, personal attitudes.

Future Directions

The impact of legislation on transgender implicit and explicit attitudes should be examine over longer stretches of time in future research. A longitudinal, one-year approach to the changes in transgender attitudes around a specific new policy rather than our four-week timeframe may elucidate effects that shorter intervals of time cannot fully reveal. As citizens become more aware of these new policies and as its consequences start being felt, the change in social norms

signaled by these laws may become more salient and therefore have a greater impact on personal attitudes.

The Transgender IAT is one of the most recently developed implicit association tests and it is not yet clear how these attitudes are fluctuating over time. Trends in implicit attitudes vary depending on the domain of intergroup research. For example, implicit attitudes regarding sexual orientation have been trending towards neutrality in recent years, while trends relating to other domains have remained stable (Charlesworth & Banaji, 2019). Therefore, if transgender attitudes are following a similar trend to sexual orientation, the increasingly positive attitudes that come about over time could possibly be compensating for the negative effects that would be expected from novel anti-transgender legislation going into effect. In other words, anti-transgender legislation may be "canceling out" a more general reduction in implicit biases as seen in other social groups, resulting in no change in anti-transgender biases over time that one might have expected to see if such legislation was never enacted. Determining the plausibility of this account is crucial to understanding the interplay between local legislation and more widespread attitude change.

Finally, further research is required to understand interactions between federal and local laws on transgender attitudes. Ofosu et al. (2019) found a "backlash effect" where states that did not pass same-sex marriage legalization locally showed increased anti-gay attitudes following federal legalization despite decreasing bias pre-legalization, possibly due to a feeling of threat towards their local values that are perceived to misalign with the federal decision. Similarly, the effect of expanding transgender rights, both federally and locally, may also be guiding citizens' perceptions of social norms. Indeed, the federal Biden-Harris Administration recognized Transgender Day of Visibility in March of 2022 (Scott & Wagner, 2022) in an effort to fight

back against the rising numbers of state-level anti-transgender bills that have gone into effect, although the impact of these federal acts is currently unknown.

This study is an important steppingstone in better understanding the different factors that influence the transgender attitudes held by American citizens. The quasi-experimental approach that was used to determine the lack of a significant relationship between local anti-transgender legislation and attitudes can similarly be used to inform our knowledge of pro-transgender legislation in influencing implicit and explicit attitudes. Understanding the relationship between policy and bias is crucial to being able to target elements of our sociocultural environment that lead to discrimination, and ultimately, to effectively prevent violence against transgender individuals at an institutional level.

Table 1. Description of US State-Level Anti-Transgender Laws Passed in 2021 and 2022

Date	State	Bill	Description
2021-04-13	Arkansas	HB1570	Prohibits healthcare professionals from providing or referring transgender youth to medically necessary health care. The law would also bar any state funds or insurance coverage for gender-affirming healthcare for transgender people under 18, and it would allow private insurers to refuse to cover gender-affirming care for people of any age.
2021-04-22	Montana	SB215	Allows the LGBTQ2A+ community to be denied healthcare, housing, or to be kicked out of restaurants on the basis that religion and religious beliefs can be used to justify actions in the court of law.
2021-04-30	Montana	SB280	Requires a court order that one has received surgical treatment before they can obtain an amended and accurate birth certificate.
2021-05-21	Tennessee	SB126/HB1027	Prohibits a healthcare prescriber from prescribing a course of treatment that involves hormone treatment for gender dysphoric or gender incongruent prepubertal minors.
2022-03-29	Florida	HB1557	Prohibits classroom instruction on sexual orientation or gender identity from kindergarten to grade 3 in public school districts, as well as instruction on sexual orientation or gender identity in a manner that is not "age appropriate or developmentally appropriate for students" in any grade.
2022-03-30	Arizona	SB1138	Delays irreversible gender reassignment surgery until the age of 18
2022-04-07	Alabama	SB184	Makes it a felony for any person to "engage in or cause" specified types of medical care for transgender minors. Prohibits practices that alter or affirm a minor's sexual identity or perception, such as prescribing puberty blocking medication or surgeries.
2022-04-07	Alabama	HB322	Bans transgender kids from using restrooms that align with their gender identity in public K-12 schools.
2022-04-26	Oklahoma	SB1100	Requires male and female to be the only options on birth certificates to identify a child's sex at birth. Prohibits nonbinary designation.
2022-04-29	Arizona	HB2161	Allows parents to sue educators who "usurp" their parental rights to "direct the upbringing, education, health care and mental health" of their children.

2022-05-25	Oklahoma	SB615	Requires restrooms or changing rooms in Oklahoma public schools to be designated exclusively based on biological sex.
2022-05-31	Louisiana	HR158	Requests a study of gender-altering procedures for minors and the risks associated with such procedures.

Table 2. Descriptive Statistics and Correlations for In-State Implicit Transgender Attitudes

Bill	Pre-Policy Mean	Pre-Policy SD	Post-Policy Mean	Post-Policy SD	t-value	Degrees of freedom (df)	p-value
SB184	*0.216*	*0.431*	*0.189*	*0.417*	*0.272*	*71*	*0.787*
HB322	*0.216*	*0.431*	*0.189*	*0.417*	*0.272*	*71*	*0.787*
SB1138	0.093	0.375	0.084	0.420	0.128	142	0.898
HB2161	0.195	0.400	0.179	0.438	0.187	99	0.852
HB1570	0.103	0.384	0.166	0.459	-0.599	68	0.551
HB1557	0.152	0.485	0.189	0.435	-0.642	251	0.522
HR158	0.061	0.380	0.197	0.416	-0.781	23	0.443
SB215	-0.037	0.414	0.180	0.502	-1.486	38	0.145
SB280	0.070	0.563	0.048	0.399	0.135	35	0.893
SB1100	0.152	0.472	0.141	0.515	0.056	30	0.956
SB615	0.230	0.492	0.103	0.560	0.616	24	0.544
SB126/ HB1027	-0.035	0.460	0.127	0.450	-1.667	88	0.099

Note. *Italic* indicates that two separate bills were passed in Alabama on the same day (SB184 and HB322). Thus, the participants grouped as *in-state* vs. *out-of-state* are the same in both cases, as well as the two-week time periods before and after policy enactment.

Table 3. Descriptive Statistics and Correlations for Out-of-State Implicit Transgender Attitudes

Bill	*Pre-Policy* Mean	*Pre-Policy* SD	*Post-Policy* Mean	*Post-Policy* SD	*t*-value	Degrees of freedom (df)	*p*-value
SB184	*0.112*	*0.457*	*0.124*	*0.438*	*-1.066*	*6478*	*0.287*
HB322	*0.112*	*0.457*	*0.124*	*0.438*	*-1.066*	*6478*	*0.287*
SB1138	0.120	0.455	0.115	0.451	0.417	6183	0.677
HB2161	0.130	0.429	0.114	0.458	1.338	5419	0.181
HB1570	0.114	0.451	0.110	0.450	0.408	8799	0.683
HB1557	0.127	0.454	0.108	0.450	1.642	6146	0.101
HR158	0.132	0.449	0.111	0.444	1.516	4089	0.130
SB215	0.115	0.451	0.105	0.450	1.025	8561	0.305
SB280	0.104	0.449	0.111	0.445	-0.621	7685	0.535
SB1100	0.135	0.433	0.113	0.453	1.875	5735	0.061
SB615	0.126	0.450	0.111	0.457	1.053	3973	0.293
SB126/ HB1027	0.123	0.443	0.129	0.437	-0.557	5617	0.578

Table 4. Descriptive Statistics and Correlations for In-State Explicit Transgender Attitudes

Bill	*Pre-Policy* Mean	*Pre-Policy* SD	*Post-Policy* Mean	*Post-Policy* SD	*t*-value	Degrees of freedom (df)	*p*-value
SB184	*4.50*	*1.261*	*4.54*	*1.295*	*-0.128*	*71*	*0.898*
HB322	*4.50*	*1.261*	*4.54*	*1.295*	*-0.128*	*71*	*0.898*
SB1138	4.60	1.195	4.36	1.280	1.098	140	0.274
HB2161	4.54	1.128	4.44	1.211	0.415	106	0.679
HB1570	4.56	1.190	4.72	1.241	-0.557	73	0.580
HB1557	4.65	1.123	4.42	1.275	1.549	260	0.123
HR158	4.13	1.727	4.76	1.522	-0.940	23	0.357
SB215	4.48	1.046	4.33	0.970	0.467	41	0.643
SB280	4.44	0.964	4.13	1.154	0.894	38	0.377
SB1100	4.40	1.190	4.64	1.502	-0.507	34	0.616
SB615	4.40	0.632	4.64	1.206	-0.650	24	0.522
SB126/ HB1027	4.37	1.172	4.40	1.033	-0.148	90	0.883

Table 5. Descriptive Statistics and Correlations for Out-of-State Explicit Transgender Attitudes

Bill	*Pre-Policy* Mean	*Pre-Policy* SD	*Post-Policy* Mean	*Post-Policy* SD	*t*-value	Degrees of freedom (df)	*p*-value
SB184	*4.45*	*1.215*	*4.44*	*1.196*	*0.225*	*6813*	*0.822*
HB322	*4.45*	*1.215*	*4.44*	*1.196*	*0.225*	*6813*	*0.822*
SB1138	4.45	1.202	4.43	1.212	0.570	6498	0.569
HB2161	4.51	1.190	4.42	1.196	2.861	5704	**0.004**
HB1570	4.41	1.108	4.44	1.139	-1.491	9294	0.136
HB1557	4.45	1.188	4.43	1.213	0.691	6451	0.490
HR158	4.43	1.125	4.39	1.135	1.092	4298	0.275
SB215	4.43	1.132	4.41	1.101	0.975	9025	0.329
SB280	4.42	1.133	4.42	1.102	0.205	8107	0.838
SB1100	4.49	1.192	4.45	1.204	1.242	6044	0.214
SB615	4.39	1.121	4.38	1.145	0.228	4165	0.820
SB126/ HB1027	4.43	1.113	4.41	1.095	0.848	5876	0.396

Note. Bold indicates significance at p ≤ 0.05.

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Appendix

Statement of Contribution

As the primary researcher for this project, W.S. took the lead on the online gathering of policy data, data analysis, and writing of this final paper. W.S. and J.A (faculty supervisor) collaborated on the research project's conception. J.A. provided parts of the Transgender IAT data to be analyzed and supervised the student in every step of the project. Finally, J.A. made editorial contributions throughout the writing of the manuscript by W.S. This project was done independently of the other projects in the laboratory.