Beyond the Binary: How Knowledge from Religion, Science, and Personal Contact Shape Hostility Toward Transgender Rights

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Maggie M. Selman graduated from High Point University in 2024 with B.A. degrees in Political Science and Strategic Communication. Her manuscript explores public opinion surrounding transgender issues, inspired by witnessing friends from high school face discrimination while embracing their identities. Motivated by a desire to understand and address the roots of this prejudice, Maggie's research aims to contribute to the creation of safer, more inclusive communities. She is currently pursuing a Master's in Education for Museums and Heritage at the University of Glasgow, with plans to develop museum programs that engage underserved communities. Maggie credits Drs. Setzler and Kifer for helping her cultivate professionalism and confidence in her work—skills that have been essential in her graduate studies and future career path.

Abstract

Despite popular support for civil rights protections for transgender people, the last few years have seen hundreds of anti-trans bills introduced in state legislatures. Research has demonstrated that religion/religiosity, political party/ideology, gender, and race are all significant predictors of transprejudice. However, the literature has yet to examine how different sources of knowledge that inform attitudes toward trans identities predict hostility toward trans rights. This study analyzes data from Pew Research Center's May 2022 American Trends Panel using bivariate logistic regression to analyze three sources of knowledge – religious views, scientific knowledge, and contact – as predictors of hostility toward civil and body-centric rights for transgender people. Results indicate citing strong influence from religious teachings increases the likelihood of exhibiting hostility toward both civil and body-centric rights. Citing knowledge from science as a strong influence had more mixed results, correlating to a lower likelihood of hostility toward civil rights but a higher likelihood of hostility toward laws requiring insurance coverage for gender-affirming healthcare (compared to those not citing science as a strong influence). Finally, though not a significant predictor of hostility toward civil rights, citing contact with a trans person as a strong influence significantly reduced a person's likelihood of exhibiting hostility toward body-centric rights. These findings indicate that the knowledge source that informs one's attitudes toward trans rights is worthy of consideration when developing strategies to reduce transprejudice, though there are more important factors to consider. Further research should continue to study education and interpersonal contact as strategies for mitigating LGBT+ prejudice.

According to recent estimates, somewhere between .44 and .93 percent of the U.S. population – about 1.4 million U.S. adults – identify as transgender (Doan and Grace 2022, 277; Doan, Quadlin, and Powell 2019, 1). Pew defines transgender individuals as "people whose gender is different from the sex they were assigned at birth" (Parker, Horowitz, and Brown 2022, 3). Despite their sizable numbers, trans people continue to be targets of harassment, violence, hate crimes, and discriminatory legislation (Cao and Gurcay 2022, 2210; Schipper 2022). Though twenty states and the District of Columbia have statutes explicitly prohibiting employment, housing, and public accommodation discrimination based on gender identity, the last few years have seen many states proposing anti-trans legislation (Luhur, Brown, and Flores 2019, 1; Schipper 2022, 1-2). A recent report by Reuters (Funakoshi & Raychaudhuri 2023) revealed that, in 2023 alone, "…37 U.S. states have introduced at least 142 bills to restrict gender-affirming healthcare for trans and gender-expansive people this year, nearly three times as many as last year." The report continued, explaining that nearly 80 percent of those bills target gender-affirming care for children under 18. For comparison, only 35 of the 250 anti-trans bills proposed in state legislatures in 2022 sought to block minors from accessing gender-affirming care (Schipper 2022, 2), while others aimed to limit or prohibit discussions of sexual orientation or gender identity in K-12 schools (Parker, Horowitz, and Brown 2022, 26). Of the 142 bills introduced, 22 have already passed, while only 18 have failed or been vetoed (the rest remain "engrossed" in the legislative process) (Funakoshi & Raychaudhuri 2023). Yet, this slew of anti-trans legislation is incongruent with several public opinion surveys showing that the majority of people (72.7% and 64% respectively) support laws that would protect trans people from discrimination (Luhur, Brown, and Flores 2019, 4; Parker, Horowitz, and Brown 2022, 4).

In recent years, researchers have increasingly shown interest in the factors that influence public opinion on LGBT+ rights. While much of this research has focused on opinions surrounding lesbian, gay, and bisexual individuals, the last decade has seen a significant increase in literature focusing on public opinion of transgender issues (Becker and Jones 2020, 1051-1052; Bowers and Whitley 2020, 400). It is well-established that, while public support for transgender identity has grown in recent decades, there are still trans issues that divide the public (Luhur, Brown, and Flores 2019, 1). Notably, while there seems to be general support for the protection of trans individuals on civil rights issues, there is greater disagreement on what are called "body-centric" issues – those that focus on "how transgender people present, engage, and seek treatment for their bodies as well as how this engagement and presentation should be managed by society" (Bowers and Whitley 2020, 403; Cao and Gurcay 2021, 2211). Specifically, these body-centric issues tend to center around healthcare and bathroom access for trans people.

Existing literature reveals several factors that significantly influence a person's hostility toward transgender individuals. Specifically, scholars have determined that political affiliation, religion/religiosity, gender, and race (Doan, Quadlin, and Powell 2019; Bowers and Whitely 2020; Flores et al. 2020; Regnerus and Vurmurlen 2021; Doan and Grace 2022) are all strong predictors of a person's likelihood of expressing hostility toward trans identities or rights.

Using data from the May 2022 American Trends Panel, I will build on this knowledge by investigating the relationship between the stated influence of various sources of knowledge (i.e., religion, science, and knowing someone who is trans) on individuals' views of trans people and their displayed hostility toward transgender people as measured by their support (or opposition) to several laws either protecting or restricting trans rights. This research will provide valuable insight into possible motivations behind trans hostility. Moreover, I will discuss the impact of

scientific knowledge and education on the literature. Ultimately, the value of this research lies in its ability to provide insight into the root causes of hostility toward transgender individuals, which might help us combat such prejudice to make the world (or even just one community) a safer place for people to live authentically as themselves.

Literature Review

Who is Hostile Toward Trans Identities & Rights?

Throughout the literature, two factors emerge as leading predictors of public opinion on transgender issues: religion/religiosity and partisanship/ideology. When it comes to religion, Evangelicals tend to be less supportive of trans issues and rights. Doan, Quadlin, and Powell (2019, 13) cite Evangelicals as one of the groups with the most restrictive views of transgender persons. Moreover, moral traditionalism and religious attendance are both negatively correlated with support for trans persons (Flores et al. 2020, 390; Cao and Gurcay 2022, 2222). In other words, higher religiosity (measured by religious attendance) predicts higher levels of transprejudice, though this result varies slightly among participants who identify as a sexual minority (Bowers and Whitely 2020, 406; Campbell, Hinton, and Anderson 2019). Additionally, those who interpret the Bible literally are significantly more likely to exhibit transprejudice. Still, religious fundamentalism was only a predictor among female participants (in one study) or when combined with authoritarian traits (Campbell, Hinton, and Anderson, 2019). In one study that examined the existing literature on the relationship between religion and attitudes toward trans people, researchers found that self-identification as "religious" was correlated to higher levels of transphobia. The same study indicated that Christian respondents were more likely than non-Christian and Jewish participants to hold prejudices against trans people. When it comes to the influence of religious denomination on support for trans people, the results were more mixed. While one study reviewed found more transprejudice among Protestants, another study found that any Christian identification *except* Evangelical or Protestant predicted increases in transprejudice (Campbell, Hinton, and Anderson 2019).

As explained by Becker and Jones (2021), partisanship is another significant predictor of support for transgender rights, with Democrats being consistently more likely than Republicans to indicate support for trans individuals and issues. Likewise, individuals who score higher on a political conservativeness scale tend to show less support for trans issues and rights. Across almost all prior studies examined, demographic factors such as sex, sexual orientation, race, age, income, and education are used as control variables. While most of these controls have shown varied results, sex is consistently a predictor of support for trans individuals. Specifically, men are less likely than women to support protections for trans individuals (Bowers and Whitley 2020; Flores et al. 2020; Flores 2015, 407; Becker and Jones 2020, 1054; Lewis et al. 2017, 870). This may be attributed to the fact that, as some research has indicated, men tend to have more conservative views when it comes to gender than women (Doan and Grace 2022, 294). Additionally, members of sexual minorities tend to hold more progressive attitudes toward transgender people (Doan, Quadlin, and Powell 2019). Another study found that race and ethnicity were correlated to support for medical intervention in the treatment of gender dysphoria. Specifically, identifying as Black was correlated to disapproval of medical interventions (Regnerus and Vurmurlen 2021). These results corroborate earlier findings by Flores (2015), which determined that respondents identifying as Black exhibited more negative transgender attitudes. While there are consistent indications that young people, individuals with higher levels of education, individuals with higher income, and White people tend to be more

supportive of trans individuals and rights, the significance of factors like race, income, and educational attainment varied significantly depending on what exactly was being measured and the addition of certain independent variables (Doan, Quadlin, and Powell 2019, 4; Cao and Gurcay 2022, 2211; Flores et al. 2020, 385; Flores 2015).

When it comes to measuring opinions about transgender persons, several approaches emerge in the literature. For measuring opinions toward legal protections of trans people, most studies utilize scales ranging from four to seven points, with some variation of "strongly agree" at one end and some variation of "strongly disagree" at the other (Lewis et al. 2017; Luhur, Brown, & Flores 2019; Flores 2015; Cao & Gurcay 2022; Regnerus & Vurmurlen 2021; Bowers & Whitley 2020). Though specific questions ranged by what was being measured, the following are several statements that participants were asked to rank by the scales above: [Transgender people] should be protected from discrimination, they should be allowed to use the restroom of the sex they identify with (Luhur, Brown, & Flores 2019), "[I support laws that…] allow transgender people to serve openly in the U.S. military," "…grant transgender students the right to participate in sex-segregated programs/activities and use sex-segregated facilities based on their self-identified sex" (Cao & Gurcay 2022), "To what extent do you support the following protections for transgender people…" [employment discrimination, housing discrimination, bathroom access, and healthcare access, respectively] (Bowers & Whitley 2020), and "It should be ok for adolescents to 'transition' with hormones or surgery if they identify with another gender" (Regnerus & Vurmurlen 2021). These questions can be categorized more broadly into those that address civil rights and bodily autonomy ("body-centric") rights.

Cognitive Consistency

Several theories can be used to address varying levels of hostility toward transgender rights. One such theory is Cognitive Consistency Theory. Essentially, the theory holds that humans tend to act in a way that is consistent with their existing attitudes and beliefs because inconsistent actions elicit negative reactions. According to Kruglanski et al. (2018), Cognitive Consistency Theory has been recognized by psychologists as a primary motivator in decision-making since the 1950s. Though Kruglanski et al. question the validity of the original theory, cognitive consistency has been used historically to guide public opinion research regarding transgender people. Specifically, Lewis et al. (2017, 863) posit that individuals may be "attitudinally constrained" by their established ideological and religious beliefs. Thus, they are likely to display attitudes toward transgender people consistent with their other attitudes toward the broader LGBT+ community. In particular, they believed that the cognitive consistency effect would be greater for "stronger ideologues" and "highly religious individuals." Respondents were asked questions to indicate their level of agreement or disagreement with the following policies: protection from discrimination in both employment and public accommodations, antibullying measures in schools, and rights of businesses to refuse service on religious grounds. They found that strong ideologues and religious affiliation (but not religious attendance) were likely to show consistency in their support for public accommodations policy. They ultimately conclude that, while these factors may not directly impact attitudes toward policy, they likely indirectly impact such attitudes by shaping views toward transgender and LGB people more broadly. Put simply, the results from this study indicate that the more extreme an individual is in their ideology or religiosity, the more likely they are to hold attitudes toward transgender people and protections that are consistent with the stances taken by those institutions (i.e., political parties and religion). Thus, it stands to reason that individuals who cite religion as a highly influential factor in their views toward trans people would, likewise, exhibit this consistency.

Education for Prejudice Reduction

Another theory that may explain variation in levels of hostility is the theory of education for prejudice reduction. Within the broader theory of multicultural education, prejudice reduction is its framework for teaching. According to Banks (1993), multicultural education is "education is signed to help students develop more democratic attitudes, values behaviors" (24). When Banks conducted his study, the field generally focused on multicultural education as a means of reducing racial and anti-woman prejudices. However, such a framework can easily be applied to any marginalized group, including transgender people. In Banks' review of more than a dozen studies conducted between the 1940s and 1970s, he repeatedly found that incorporating multicultural (specifically racial) exposure and tolerance into school curriculums had a positive effect on children's racial attitudes (26-28). In addition to the prejudice reduction framework, Banks also discusses the importance of the knowledge construction framework. Essentially, this framework explains that, rather than simply incorporating information about marginalized groups into a curriculum, the most effective way to alter attitudes is to establish a curriculum that "reconceptualizes" students' understandings of where their attitudes and knowledge originate. In turn, this framework encourages students to think critically about the impact of their sources of knowledge and how different experiences may lead to different perceptions of the world (37). Looking at another potential means of prejudice reduction, McKown (2005) proposed a science-based framework for developing prejudice interventions in schools. McKown explains that combining multiple ecological frameworks, like social cognitive skills and cooperative learning, for one intervention may be a more effective way to obtain longer-lasting results because such a strategy addresses multiple aspects of prejudicial attitudes at once. According to McKown's model, deciding on a prejudice intervention strategy should start with an ecological assessment to determine what is contributing to the prejudice, and then the intervention strategy can be more specifically targeted. Where Banks and McKown focused on multicultural education for children, a literature review conducted by Kiselica, Maben, and Locke (1999) tentatively reaffirmed prior findings as they apply to adults (specifically counseling trainees). One study they reviewed demonstrated significant prejudice reduction toward "homosexuals" among counseling trainees who underwent multicultural education (248).

Aside from using educational frameworks, other studies demonstrate that certain types of education, like scientific education, can influence political and moral opinions. Morrison, Duncan, and Parton (2015) found that an individual's scientific knowledge had a significant mediating effect on views of climate change, particularly among certain religious groups. However, the direction of these effects was "perverse" (13). Perhaps the reason for this perversion is explained by Shils (1974) in his writings on the legitimacy of faith and science. Shils explains that religious thinkers have generally sought to make peace with scientific knowledge and use it as "possible bases for alliance" (1). However, religious thinkers may part from scientific knowledge where they perceive "excesses." In other words, religious thinkers might disavow a particular scientific teaching when it egregiously contradicts their established beliefs and values. While literature has yet to exist investigating the influence of scientific knowledge on attitudes toward trans people, Shils' work helps us understand when people might rely on scientific knowledge versus religious knowledge. Shils points out that many people express support for science because of its practicality and the perception that scientific technology will improve life in the future (2-3). Moreover, Shils explains that reliance on scientific knowledge may reflect broader trends toward secularism. Among less religious populations, particularly liberals, faith that once would have been placed in a priest, for example,

is now shifting to scientists (2-4). Collectively, Shils' work implies that especially "radical" or liberal ideas could be where scientific knowledge and religious teachings diverge. Given the sharp ideological and religious divides established on transgender issues, it stands to reason that these issues might be one point where scientific knowledge and religious teachings diverge, with scientific knowledge supporting more liberal stances.

Evans (2011) delves deeper into the potential reasons for the conflict between religion and science. Like Shils, Evans explains that the typical perception of religion as an antagonist to science is not necessarily accurate. According to Evans, prior literature assumed that the conflict between religion and science stemmed from a lack of trust in science on the part of religious folks. However, Evans' review determined that the conflict is also based upon moral oppositions to scientific findings (708). Though results vary depending on religious denomination, the study found that conservative Protestants exhibited the most conflict with scientific teachings. Evans found that the reason for this conflict stems from the fact that this population tends to believe in their religion more than science, though they do think that scientific findings should align with their religious teachings. Consequently, when conflict does arise, they are more apt to assume that the science got it wrong (721-723). Collectively, these results indicate that scientific knowledge may be both a means of reducing transprejudice and pose as an antagonist to religious views when it comes to public attitudes toward trans people.

Contact Theory

The final theory that might explain varied levels of hostility toward trans rights is Contact Theory. Contact Theory suggests that contact between groups can effectively reduce hostility between said groups. Like cognitive consistency, Contact Theory is a social scientific theory that was developed during the 1950s. The so-called "Intergroup Contact Theory" was pioneered by Gordon Allport in his 1954 book *The Nature of Prejudice*. According to Allport, prejudice could be reduced when both the in-group and out-group came into contact with one another under "equal status" conditions, especially when such conditions highlight commonalities between the two groups. Allport's theory was reaffirmed in a meta-analysis of more than 500 studies on the impact of intergroup contact performed by Pettigrew and Tropp (2006). One notable finding from this review was that the prejudice-reduction effects of intergroup contact occurred even without the conditions outlined by Allport. A secondary review of the theory carried out by Paluck, Green, and Green (2019) found that the effects of intergroup contact were not as strong (though still significant) in larger, more rigorous studies.

Nevertheless, several recent studies have investigated the implications of contact theory for reducing prejudice toward LGBT+ people. Building off prior research about the positive effect of contact on reducing prejudice against lesbian and gay folks, Flores found that personal familiarity with transgender people and transgender rights issues correlated with more positive attitudes toward transgender (2015). Flores also found a secondary correlation between interpersonal contact with a lesbian or gay person and positive attitudes toward transgender rights. Surprisingly, Lewis et al. (2017) found that, while interpersonal contact with lesbian or gay individuals had a positive impact on attitudes toward non-discrimination policies for that population, the same was not true for contact with transgender people and support for non-discrimination policies for the trans population. That said, interpersonal contact was correlated to more positive attitudes toward both populations. In 2022, a study by Cao and Gurcay examined the effects of interpersonal contact on support for transgender rights among moral traditionalists as mediated by a person's expressed anxiety toward transgender people (specifically, anxiety toward a transgender person serving as the respondent's child's doctor or teacher). As in the

previous studies, interpersonal contact with a transgender was determined by a single question asking the respondent whether they know someone who is transgender. However, this study also measured the diversity of interpersonal contact by asking respondents whether they were familiar with (1) no transgender people, (2) only a transgender man or woman, or (3) both a transgender man and a transgender woman. The study determined that interpersonal contact with a transgender person was negatively associated with anxiety toward the trans population and positively associated with support for transgender rights. These effects were strengthened when a respondent knew both a trans man and a trans woman.

Further research examines the effects of mere exposure to transgender people, rather than interpersonal contact, on attitudes toward transgender people. In one study, participants were split into four groups and exposed to the idea of being "transgender" in different ways. Flores et al. (2018) provided three non-control groups with a short vignette about gender identity that included a definition of "transgender." Two of these groups were shown images of transgender people (one group saw images of people whose facial features were congruent to their gender identity, while the other group saw incongruent images). Participants were then asked to indicate their feelings regarding five statements designed to gauge levels of transphobia and agreement/disagreement with nine different policies, including laws prohibiting employment or public accommodation discrimination, requiring insurance companies to pay for gender-affirming healthcare, and permitting trans people to use public bathrooms that align with their gender identities. The findings indicated that transphobia significantly impacted respondents' attitudes toward transgender people. However, exposure to transgender people in all three non-control groups was correlated with a reduction in exhibited transphobia. In alignment with Lewis et al.'s earlier findings (2017), the group treated with only a vignette about transgender identity (with no accompanying image) displayed the most significant reduction in transphobia. However, the difference was only a 0.1 standard deviation difference from the group shown the incongruent image. Therefore, while exposure may not significantly alter attitudes toward policy, it did have a significant impact on people's general attitudes toward transgender people.

Hypothesis

Previous research findings regarding predictors of hostility toward trans rights, attitudinal origins, and methods for prejudice reduction support three primary hypotheses:

H1: Those who say religion has a significant impact on their views of trans people are likely to hold attitudes aligned with religious teachings about the validity of transgender identities and the broader opinions expressed by highly religious individuals. Thus, they are more likely to express greater hostility toward both civil and body-centric transgender rights than those who do not cite religion as a significant influence on their views of trans people.

H2: Based on previous studies that pose scientific knowledge as an antagonist to religious teachings on select topics (Shils 1974; Evans 2011) and others that suggest education as a means of prejudice reduction (Banks 1993; Kiselica, Maben, and Locke 1999), I expect that those who do not cite knowledge gained from science as a significant influence are more likely to exhibit hostility toward both civil and body-centric trans rights.

H3: Because Contact Theory explains that individuals who have come into contact with members of another group are less likely to display prejudice toward the said group, I expect

that those who do not cite familiarity with a trans person as a source of their attitudes are more likely to display hostility toward both civil and body-centric rights for trans people.

Data & Measurement

To test these hypotheses, I utilize data from Wave 109 of Pew Research Center's American Trends Panel. This survey fielded responses from 10,188 participants and was conducted online from May 16 to May 22, 2022. The American Trends Panel employs random sampling to gain a nationally representative sample of American adults. To ensure true randomization, Pew recruits panel members by sending out invitations at random to U.S. addresses. Within each household, participants are chosen at random based on the adult with the next birthday. To ensure true representativeness, Pew provides non-internet households with tablets for taking surveys. Once surveys are completed, participants receive some monetary compensation. All variables in this test derive from questions asked of the entire survey sample. After removing participants who refused to answer each question about influences on transgender attitudes and separating responses into strong influence and weak influence groups, I was left with the following samples: 2,886 respondents cite religion as a strong influence (7,206 do not); 4,455 respondents cite knowledge from science as a strong influence (5,639 do not); and 2,191 respondents cite contact with a trans person as a strong influence (7,902 do not).

Dependent and Independent Variables

The primary variables of interest in this study are an individual's reported hostility toward transgender rights as measured by a respondent's expressed support or opposition to several pieces of proposed legislation. As in previous studies, support was measured on a five-point scale ranging from "strongly favor" to "strongly oppose" (Lewis et al. 2017; Luhur, Brown, & Flores 2019; Flores 2015; Cao & Gurcay 2022; Regnerus & Vurmurlen 2021; Bowers & Whitley 2020). Specifically, respondents were provided the following prompt with each item presented in a random order:

Here are some current laws and policies in the U.S. related to transgender issues that are either in place or being considered. Would you favor or oppose laws or policies that do each of the following?

(1) Protect transgender individuals from discrimination in jobs, housing, and public spaces such as restaurants and stores.

(2) Require health insurance companies to cover medical care for gender transitions.

(3) Make it illegal for healthcare professionals to provide someone younger than 18 with medical care for a gender transition.

(4) Investigate parents for child abuse if they help someone younger than 18 get medical care for a gender transition.

Each of these measures was recoded as a dichotomous variable, where 1 indicated hostility. On the first two measures (i.e., discrimination protection and insurance coverage), respondents were coded as hostile only if they expressed opposition to the proposed policy (responses of 4 or 5). Considering alternative reasons respondents may feel less favorable to these policies (e.g., opposition to government intervention in civil rights, varying views on broader insurance practices, etc.), individuals who indicated a neutral stance were coded as not being hostile. Because both questions deal with policies about access to gender-affirming healthcare among minors, they were combined to create one variable called *NoCareForMinors*. Due to the severity

of the proposed laws, Individuals who did not outright reject *both* policies were coded as being hostile. In other words, individuals were coded as being hostile if they expressed support or neutrality toward one or both of these policies.

My predictors for hostility are a set of factors whose influence on transgender identity was questioned in the American Trends Panel. The following questions were asked of all respondents, who then answered on a scale of 1 (a great deal) to 5 (not at all):

How much has each of the following influenced your views about whether someone's gender can be different from the sex they were assigned at birth?

(1) Your religious views

(2) What you've learned from science

(3) Knowing someone who is transgender

(As a note, these questions were not mutually exclusive. A respondent could say that multiple items were strong influences). Each of these variables was then recoded to be dichotomous, with answers of 1 or 2 being coded as a strong influence (1) and 3 through 5 being a weak influence (0).

Control Variables

Based on prior findings about what influences attitudes toward transgender identities and rights, several controls have been incorporated into this model, including religiosity/religion, party/ideology, gender, race/ethnicity, age, and education. Religiosity was recoded from an interval variable, asking respondents the frequency with which they attend religious services, into a dichotomous variable, with those attending services once a week or more being coded as highly religious (1). Because numerous studies have linked Evangelism to higher levels of hostility toward trans people (Doan, Quadlin, and Powell 2019, 13; Campbell, Hinton, and Anderson 2019), I included a dummy variable identifying Evangelical Protestants (coded from those identifying as Protestant on one question and Evangelical or Born-Again Christian on another). As some of the most significant predictors of trans hostility (Becker and Jones 2021), dummy variables were also created to measure partisanship (Republican, Democrat, and Independent). However, ideology was kept as an interval variable (More Conservative to More Liberal). Dummy variables were also created for race/ethnicity (White, Black, and Other) after previous studies identified being Black as a significant predictor of negative attitudes toward trans people (Regnerus and Vurmurlen 2021; Flores 2015). Finally, because prior studies have had mixed results about their influence (Doan, Quadlin, and Powell 2019, 4; Cao and Gurcay 2022, 2211; Flores et al. 2020, 385; Flores 2015), I have also included controls for age (pre-coded as a four-category variable in the ATP) and education (pre-coded as a six-category variable in the ATP), both of which remain categorical variables (sans respondents who refused to answer).

The table below shows summary statistics for each of the aforementioned variables:

	N	Mean	SD	Min.	Max.
Dependent Variables					
Hostile toward laws should protect trans people from discrimination	10,137	.101	.301	0	1
Hostile toward insurance should be required to cover gender-affirming healthcare	10,106	.444	.497	0	1

Hostile toward helping minors obtain gender-affirming healthcare	10,083	.774	.419	0	1
Independent Variables					
What is learned from religion is a strong influence	10,091	.286	.452	0	1
What is learned from science is a strong influence	10,094	.441	.497	0	1
Personal contact is a strong influence	10,093	.217	.412	0	1
Controls					
High religious attendance	10,147	.245	.43	0	1
Evangelical Protestant	10,188	.242	.429	0	1
Republican	9,999	.265	.442	0	1
Democrat	9,999	.322	.467	0	1
Independent	9,999	.267	.442	0	1
Ideology	9,840	2.897	1.063	1	5
Male	10,162	.474	.499	0	1
White, non-Hispanic	10,035	.639	.48	0	1
Black, non-Hispanic	10,035	.116	.32	0	1
Hispanic/Latino	10,035	.161	.367	0	1
Other race/ethnicity	10,035	.085	.278	0	1
Age	10,145	2.501	1.024	1	4
Education	10,163	3.422	1.6	1	6

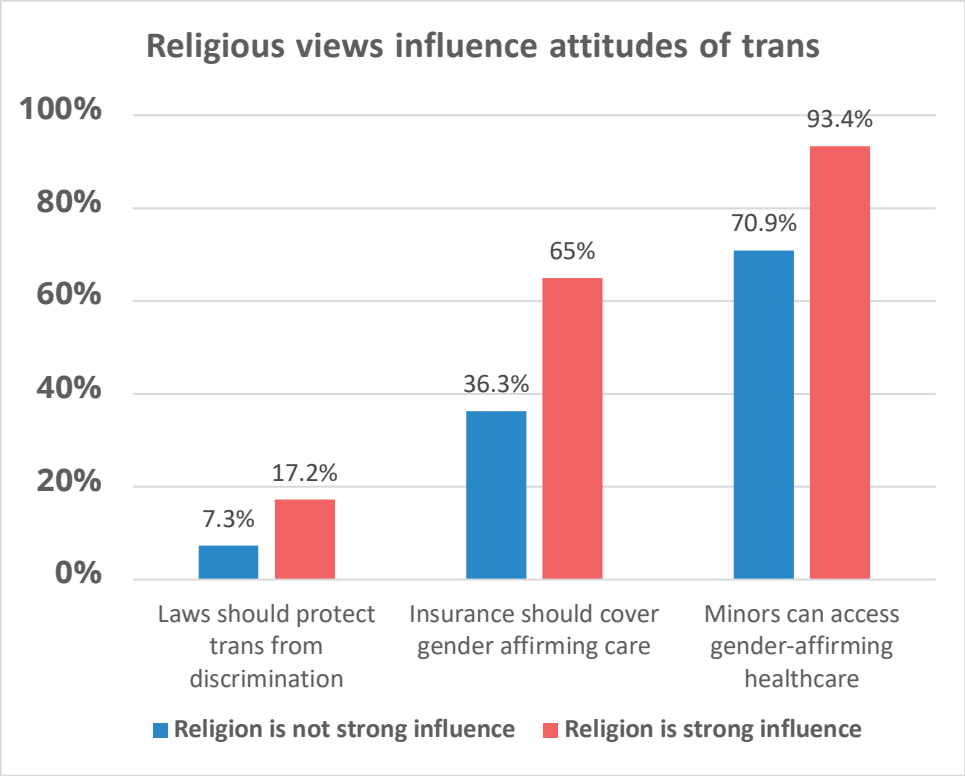
For further information on coding, refer to Appendix A.

Results & Findings

Bivariate Analysis

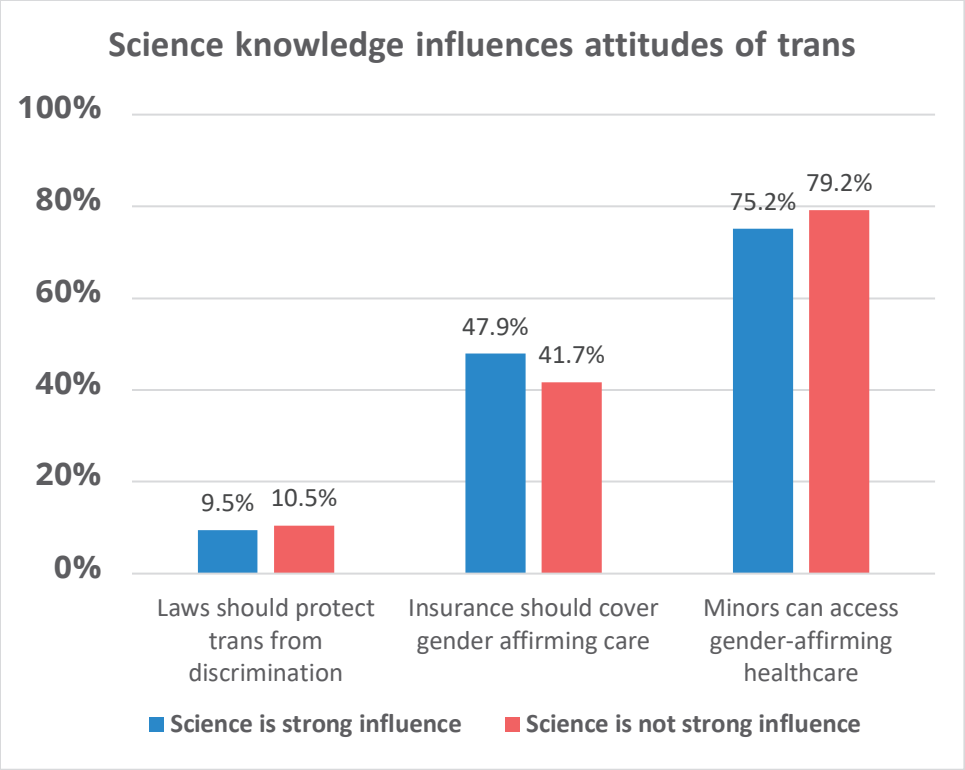
The following charts display bivariate analyses for each of my independent variables:

Figure 1. Bivariate analysis split by the influence of religious views.



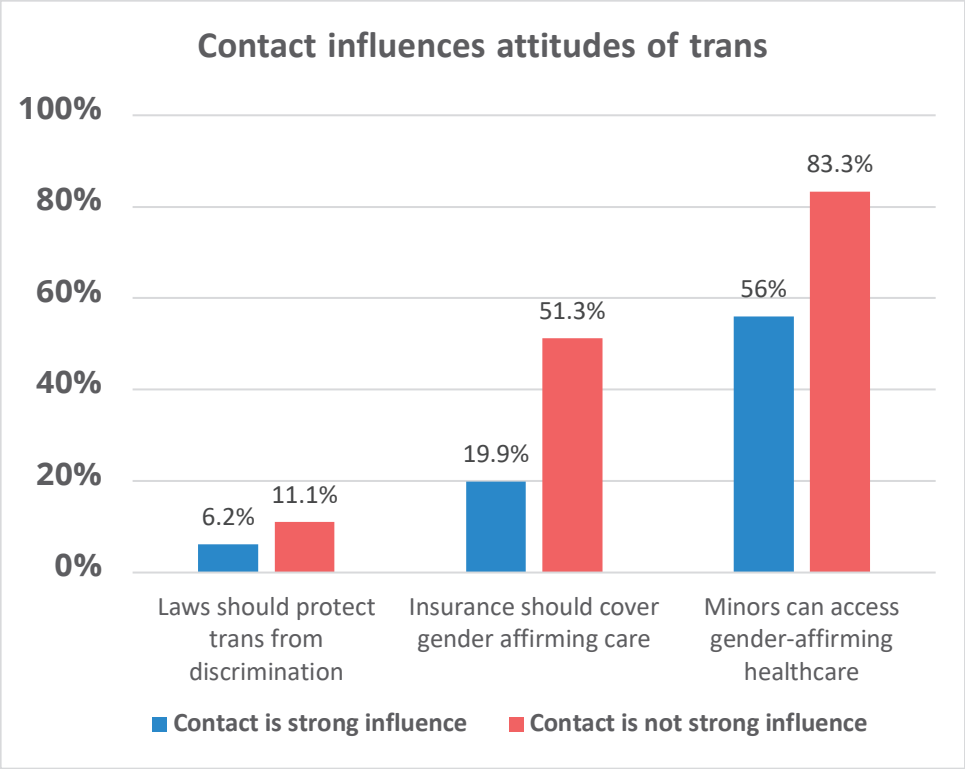
As shown in Figure 1, preliminary analysis of our first variable (without controlling for other factors) suggests that Hypothesis 1 may be correct. Across all measures of hostility, a significantly higher percentage of individuals who cited religious views as a strong influence on their attitudes toward transgender identities exhibited hostility in their responses to the proposed policies.

Figure 2. Bivariate analysis split by the influence of knowledge from science.



Preliminary observation of the impact of attitudes gained from scientific knowledge suggests only partial correctness of Hypothesis 2. As predicted, those who did not cite scientific knowledge as a strong influence on their attitudes toward transgender people *did* display greater hostility on the civil rights measure and one body-centric rights measure. However, the variation was less drastic than anticipated. Contrary to the hypothesis, those citing scientific knowledge as a strong influence displayed *greater* hostility on the question about requiring insurance coverage of gender-affirming care.

Figure 3. Bivariate analysis split by the influence of knowledge from contact with a trans person.



Like Hypothesis 2, these preliminary results suggest only partial correctness for Hypothesis 3. As predicted, those who did not cite knowledge from contact with a trans person as a significant influence on their attitudes exhibited significantly greater hostility toward trans rights across all measures. Contrary to the hypothesis, the effects of knowledge from contact did extend to body-centric rights. In fact, variations in exhibited hostility were far more pronounced on these measures compared to the measure for civil rights.

Logistic Regression

While these preliminary analyses provide a strong indication of what sources of knowledge might drive hostility toward trans rights, we must control for other factors to gain a more accurate understanding of the sources of knowledge that drive hostility. The following table shows results from logistic regression tests that included control variables:

Table 1. Logistic regression results

	Hostile toward anti-discrimination	Hostile toward requiring insurance coverage	Hostile toward gender-affirming for minors
Independent Variables			
What is learned from religion is a strong influence	1.531***	1.779***	2.97***
What is learned from science is a strong influence	.845*	1.357***	.989
Personal contact is a strong influence	.893	.343***	.473***
Controls			
High religious attendance	1.443***	1.29***	1.031
Evangelical Protestant	1.076	1.52***	1.343**
Republican	2.049***	2.738***	2.908***
Independent	1.114	1.278***	1.404***
Ideology	.659***	.537***	.395***
Male	1.602***	1.38***	1.172**
Black, non-Hispanic	1.702***	.482***	1.987***
Hispanic/Latino	.972	.817**	1.598***
Other race/ethnicity	1.953***	.854^{+}	1.684***
Age	.871***	.908***	.882***
Education	.738***	.963*	.845***
Pseudo R^2	.159	.374	.400

+ p<.1, * p<.05, ** p<.01, *** p<.00.

Upon examination, we can see that regression modeling also confirms Hypothesis 1. As the table shows, influence from religious knowledge was a significant predictor of hostility across all measures. Moreover, all measures show that citing knowledge gained from religious views and a strong influence on attitudes toward trans people increased a person's likelihood of displaying hostility toward trans rights. Looking at anti-discrimination policies, the odds ratio indicates that individual who cites religious knowledge as a strong influence were about 53% more likely to exhibit hostility toward civil rights for trans people than those who cited religious knowledge as a weaker influence. That said, Wald scores for other variables indicate that several controls are more *important* predictors of hostility.

Moving on to body-centric rights measures, the results also indicate religious knowledge as a consistent predictor of hostility. For instance, those indicating strong influence were about 78% more likely to oppose laws requiring insurance companies to cover gender-affirming healthcare compared to those who cited religious knowledge as a weaker influence. According to Wald scores, influence from religious knowledge was among the top five most important predictors of hostility on this measure. Interestingly, citing a strong influence of religious knowledge on attitudes toward trans people was a more important predictor than an individual's religiosity or identification as Evangelical Protestant (83.2 compared to 14.7 and 40.1, respectively). These results indicate that what a person *learns* from their religion may be more significant in shaping their views of trans rights than their religion and the strength of their belief. Looking more

specifically at hostility toward gender-affirming healthcare for minors, those who cited religious knowledge as a strong influence were almost three times more likely to exhibit hostility than those who cited such knowledge as a weaker influence.

Turning to Hypothesis 2, we see that the hypothesis is only partially correct. As with the bivariate analysis results, the logistic regression results show that those who cite knowledge from science as a strong influence display less hostility than those who cite such knowledge as a weaker influence on the measure for civil rights. However, the variation is more pronounced in the regression model. Specifically, the results indicate that those citing religious knowledge as a strong influence were about 15% less likely to exhibit hostility toward civil rights for trans people. Similar to the bivariate results, those citing scientific knowledge as a strong influence were more likely to exhibit hostility toward body-centric rights, though only one measure displayed significance. On the measure of support or opposition to requiring insurance companies to cover gender-affirming healthcare, those who cite scientific knowledge as a strong influence were just over one-third more likely to exhibit hostility than those who cite it as a weaker influence. Moreover, examining the Wald scores for both models, influence from scientific knowledge was a less significant predictor of hostility toward trans rights compared to the other independent variables, accounting for about half of the variance in the controls.

Regression results also partially confirmed Hypothesis 3. Notably, the influence of knowledge from contact with a trans person was not significant on the measure for civil rights, which directly contradicted the hypothesis that strong influence from contact would only mitigate hostility on that measure. That said, contact was a significant mitigating factor on both measures of hostility toward body-centric rights. Specifically, those who cite knowledge from contact with a trans person as a strong influence on their attitudes toward trans people were 66% less likely to exhibit hostility toward requiring insurance companies to cover gender-affirming healthcare and nearly 50% less likely to express hostility toward making gender-affirming healthcare available to minors than those who cited knowledge from contact as a weaker influence. Comparing Wald scores, citing knowledge from contact as a strong influence was consistently one of the most important predictors of hostility (i.e., it was the third most crucial predictor on the insurance measure and the second most important predictor on the healthcare for minors measure).

Finally, though I will not delve too deeply into my controls, they also yielded a few notable findings. Regression results support prior findings that high religiosity, more conservative political preferences, and being male increase a person's likelihood of exhibiting hostility toward trans rights. Furthermore, ideology was consistently one of, if not the most important, predictors of hostility. Also of note is the finding that education was the most important predictor of hostility toward civil rights for trans people. This finding is interesting given that prior studies tended to find mixed results regarding the significance and importance of education as a predictor of attitudes toward transgender people. These findings suggest that education may warrant further study as a predictor of hostility toward transgender rights.

Predicted Probabilities

Before drawing conclusions, it is worth analyzing predicted probabilities to help contextualize these findings.

Figure 4. Predicted probabilities for the influence of religious views.

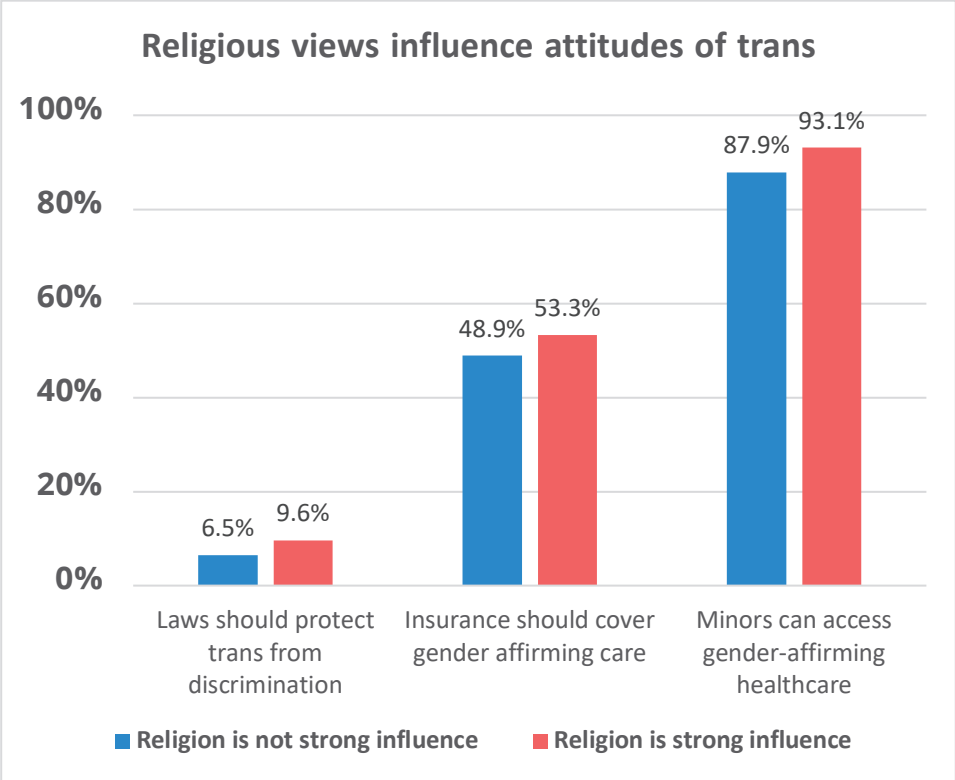

Religious views influence attitudes of trans
100%
80%
60%
40%
20%
0%
6.5%
9.6%
48.9%
53.3%
87.9%
93.1%
Laws should protect trans from discrimination
Insurance should cover gender affirming care
Minors can access gender-affirming healthcare
Religion is not strong influence
Religion is strong influence

Figure 5. Predicted probabilities for the influence of knowledge from science.

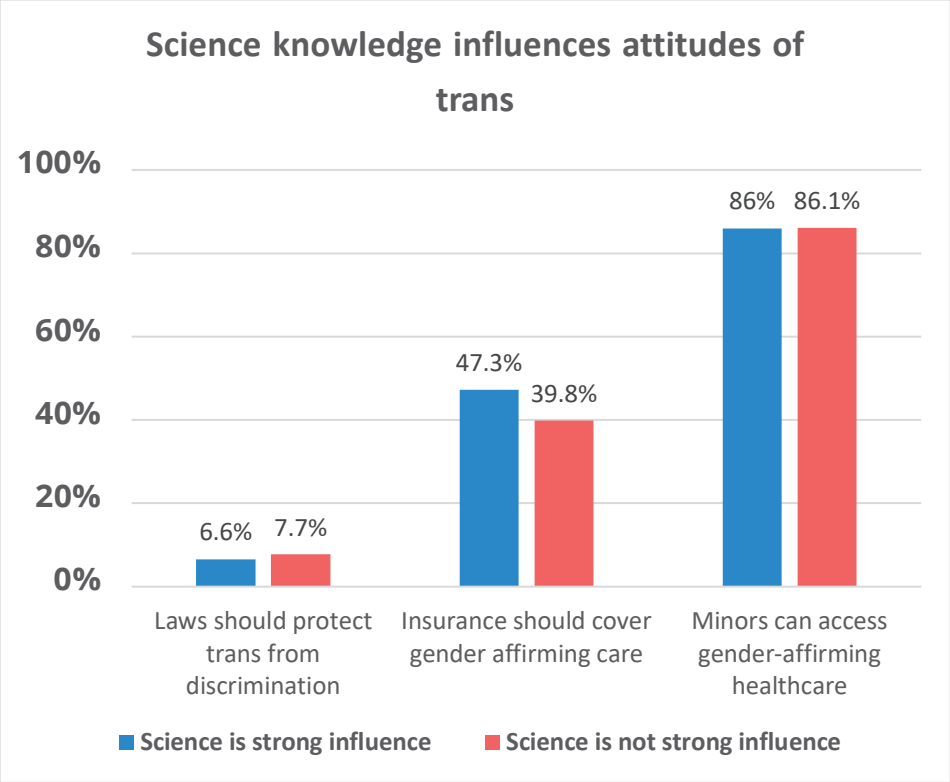
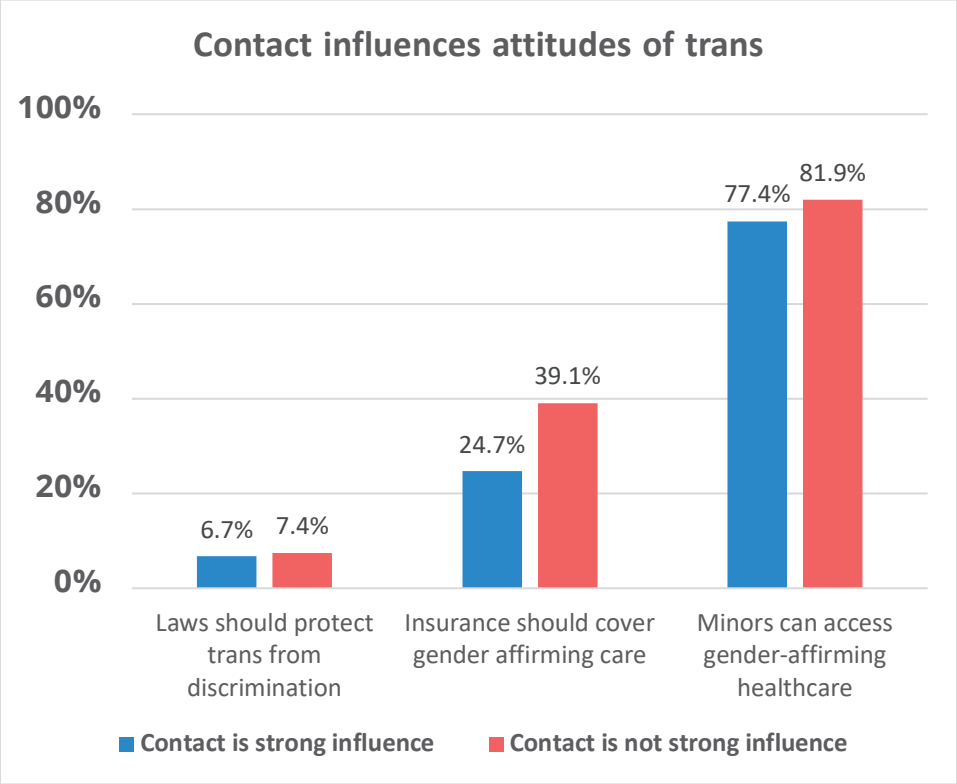


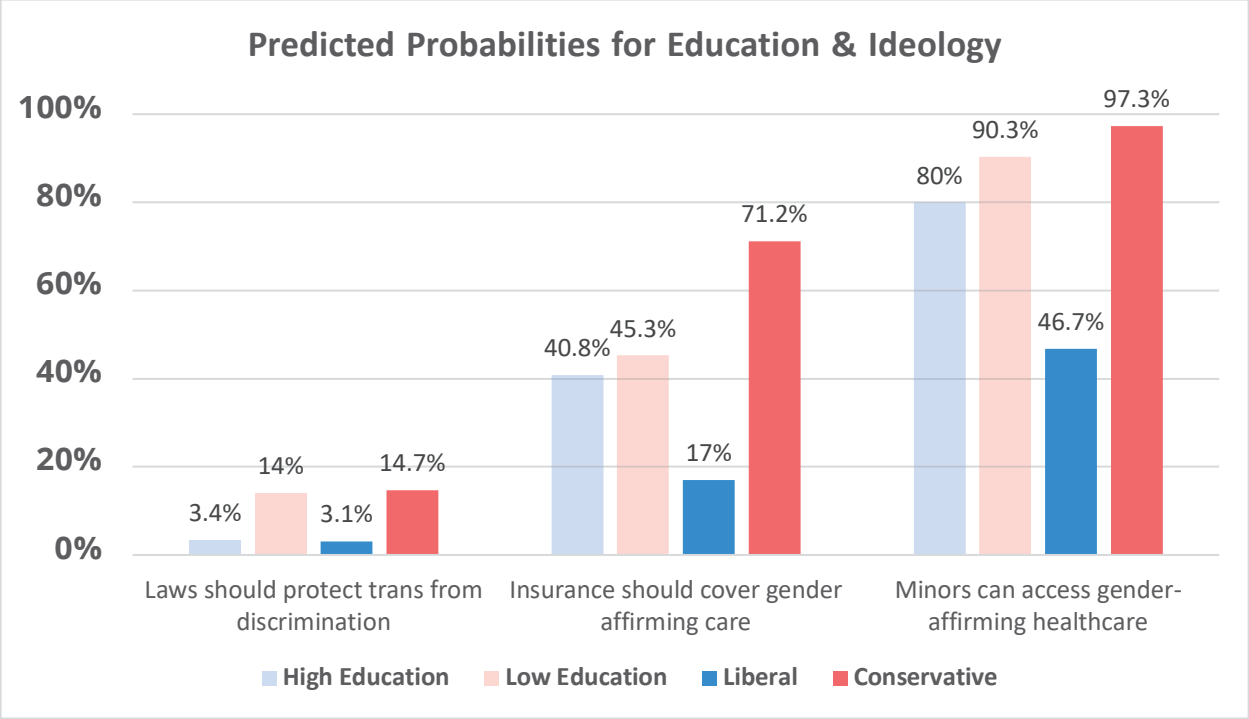
Figure 6. Predicted probabilities for the influence of contact.



As these models show, when put into context, the source of knowledge that informs a person's attitudes toward trans rights does not significantly impact their overall likelihood of exhibiting hostility. This is perhaps most clear when examining "Minors can access gender-affirming healthcare" in Figure 4. Despite regression results indicating that a person citing religious views as a strong influence on their attitudes toward trans people was almost three times more likely to exhibit hostility toward trans rights, Figure 4 shows that this only translates to a 6% difference in probability. Similar results can be observed for all variables across all measures of hostility. The only variable where a person's source of knowledge appears to matter a bit more is the issue of insurance coverage. Specifically, those who cite knowledge from contact with a trans person as a strong influence had about a 15% lower probability of exhibiting hostility on this measure compared to those who do not cite contact as a strong influence.

To further put these numbers into perspective, I also calculated predicted probabilities for education and ideology, both of which were identified as the most significant predictors of hostility across different measures. The results in the figure below show the difference in probabilities for someone with the most education compared to the least, and the most liberal views compared to the most conservative.

Figure 7. Predicted probabilities for the most important predictors of hostility.



These results reaffirm prior findings about the importance of political ideology when it comes to predicting trans hostility. This further demonstrates that, though worthy of consideration, the knowledge source that informs a person's attitudes toward trans is far less important for predicting hostility than other factors.

Conclusions

These findings contribute to the literature in several ways. First, they reaffirm religion and religious teachings as a strong predictor of hostility toward transgender rights. Because the question measuring the influence of knowledge gained from religious views was not exclusive to those identifying as Christians, these findings indicate that further study into the influence of non-Christian religions on attitudes toward trans rights may be warranted. Moreover, no prior studies reviewed looked at the influence of scientific knowledge on attitudes toward trans people. Since these findings indicate that knowledge from science is a significant predictor of hostility toward two measures of trans rights and that educational attainment is the most important predictor of hostility toward civil rights, a more in-depth study should also be done into the broader influences of various types of education on attitudes toward transgender people and rights.

The finding that knowledge from contact with trans people is a strong predictor for lower hostility toward body-centric rights contributes to the emerging narrative about contact theory and attitudes toward transgender rights. Where prior studies determined that contact is an effective technique for reducing anxiety toward and increasing acceptance of trans identities but not an effective technique for changing attitudes toward civil rights policy, this study finds that influence from knowledge gained through contact with a trans person *is* an effective technique for changing attitudes toward body-centric rights. This variation could potentially be explained

by the fact that this study used a different methodology for evaluating the influence of contact theory than prior studies. Collectively, this indicates that contact theory warrants further study as it pertains to attitudes of trans people and their rights, and future studies should utilize varying methodologies.

Ultimately, my findings hold several implications for reducing hostility toward transgender rights. While sources of knowledge are not the most important determinants of hostility, they are still worthy of consideration when developing strategies to reduce trans hostility, particularly as it relates to body-centric rights. Because those citing religious teachings as a strong influence on their attitudes toward transgender people were consistently more likely to exhibit hostility toward trans rights, strategies for reducing these hostilities should target religious belief. Specifically, reducing hostility may require religions to incorporate a stronger message of tolerance (if not acceptance) toward LGBT+ folks in their teachings. Furthermore, because influence from contact was such a strong mitigating factor for hostility toward body-centric rights, campaigns to reduce hostility toward transgender rights should focus on increasing contact between transgender people and cisgender people. However, such campaigns will need to utilize alternative methods to reduce hostility toward civil rights (though hostility toward civil rights is already relatively low). Based on my findings, the most effective strategy for reducing hostility toward transgender rights should consider both established factors, like religion and ideology, as well as sources of knowledge. For example, advocacy organizations might work to encourage contact between transgender folks and members of groups that are more likely to hold hostile views, like highly conservative or highly religious folks. By doing so, these campaigns target multiple potential sources of hostility (or acceptance) simultaneously, thus improving the chances of overall campaign efficacy.

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Appendix A. *Codebook*

Research Question: Who displays more hostility toward transgender people: those influenced by religion, those influenced by science, or those influenced by interpersonal contact?

Dataset: Pew ATP Wave 109 – May 2022

Dependent Variables

Would you favor or oppose laws or policies that do each of the following?

Original Question	Original Coding	Your Coding
TRANSGEND6_a_W109 Protect transgender individuals from discrimination in jobs, housing, and public spaces such as restaurants and stores	1= Strongly Favor 2= favor 3= neither favor nor oppose 4= oppose 5= Strongly oppose 99= refused	***ProtectTransFromDiscrimination** 1= hostile (ans. 4 or 5) 0 = not hostile (ans. 1-3) **Code:** Compute ProtectTransFromDiscrimination=$SYSMIS. IF TRANSGEND6_a_W109>3 ProtectTransFromDiscrimination=1. IF TRANSGEND6_a_W109<4 ProtectTransFromDiscrimination=0. IF TRANSGEND6_a_W109>5 ProtectTransFromDiscrimination=$SYSMIS. VARIABLE LABELS ProtectTransFromDiscrimination 'Laws should protect trans from discrimination'. VALUE LABELS ProtectTransFromDiscrimination 1 "Hostile" 0 "Not Hostile" .
TRANSGEND6_e_W109 Require health insurance companies to cover medical care for gender transitions	1= Strongly Favor 2= favor 3= neither favor nor oppose 4= oppose 5= Strongly oppose 99= refused	***ReqInsuranceToCoverCare** 1= hostile (ans. 4 or 5) 0 = not hostile (1-3) **Code:** Compute ReqInsuranceToCoverCare=$SYSMIS. IF TRANSGEND6_e_W109>3 ReqInsuranceToCoverCare=1. IF TRANSGEND6_e_W109<4 ReqInsuranceToCoverCare=0. IF TRANSGEND6_e_W109>5 ReqInsuranceToCoverCare=$SYSMIS. VARIABLE LABELS ReqInsuranceToCoverCare 'Insurance should cover gender affirming care'.

		VALUE LABELS ReqInsuranceToCoverCare 1 "Hostile" 0 "Not Hostile" .

TRANSGEND6_f_W109
TRANSGEND6_f_W109. Make it illegal for health care professionals to provide someone younger than 18 with medical care for a gender transition
 	
TRANSGEND6_g_W109
Investigate parents for child abuse if they help someone younger than 18 get medical care for a gender transition
	1= Strongly Favor
	2= favor
	3= neither favor nor oppose
	4= oppose
	5= Strongly oppose
	99= refused
		Recoded as hostile on **NoCareForMinors** if favor or neutral on either question.
		
		COMPUTE NoCareForMinors_Recode=0.
		If (TRANSGEND6_f_W109<4) OR (TRANSGEND6_g_W109<4) NoCareForMinors_Recode=1.
		IF (TRANSGEND6_f_W109=99) OR (TRANSGEND6_g_W109=99) NoCareForMinors_Recode=$SYSMIS.
		VARIABLE LABELS
		NoCareForMinors_Recode "Illegal to help minors get gender affirming healthcare".
		VALUE LABELS
		NoCareForMinors_Recode
		1 "Hostile"
		0 "Not Hostile"
		.

Independent Variables

How much has each of the following influenced your views about whether someone's gender can be different from the sex they were assigned at birth?

Original Question	Original Coding	Your Coding
TRANSGEND4_b_W109 Your religious views	1= a great deal 2= a fair amount 3= some 4= a little 5= not at all 99= refused	***ReligionStrongInfluence** 1= strong influence (ans. 1 or 2) 0= not strong influence (ans. 3-5) **Code:** Compute Religion_Dummy=0. IF TRANSGEND4_b_W109=1 OR TRANSGEND4_b_W109=2 Religion_Dummy=1. IF TRANSGEND4_b_W109>5 Religion_Dummy=$SYSMIS. VARIABLE LABELS Religion_Dummy 'Religion strongly influences views of trans'. VALUE LABELS Religion_Dummy 1 "Religion is strong influence" 0 "Religion is not strong influence"

		.
TRANSGEND4_a_W109 What you've learned from science	1= a great deal 2= a fair amount 3= some 4= a little 5= not at all 99= refused	***ScienceStrongInfluence** 1= strong influence (ans. 1 or 2) 0= not strong influence (ans. 3-5) **Code:** Compute Science_Dummy=0. IF TRANSGEND4_a_W109=1 OR TRANSGEND4_a_W109=2 Science_Dummy=1. IF TRANSGEND4_a_W109>5 Science_Dummy=$SYSMIS. VARIABLE LABELS Science_Dummy 'What is learned from science strongly influences views of trans'. VALUE LABELS Science_Dummy 1 "Science is strong influence" 0 "Science is not strong influence" .
TRANSGEND4_e_W109 Knowing someone who is transgender	1= a great deal 2= a fair amount 3= some 4= a little 5= not at all 99= refused	***ContactStrongInfluence** 1= strong influence (ans. 1 or 2) 0= not strong influence (ans. 3-5) **Code:** Compute Contact_Dummy=0. IF TRANSGEND4_e_W109=1 OR TRANSGEND4_e_W109=2 Contact_Dummy=1. IF TRANSGEND4_e_W109>5 Contact_Dummy=$SYSMIS. VARIABLE LABELS Contact_Dummy 'Knowing someone transgender strongly influences views of trans'. VALUE LABELS 1 "Contact is strong influence" 0 "Contact is not strong influence" .

Control Variables

Original Question	Original Coding	Your Coding
REL_ATTEND	1= More than once a week 2= once a week 3= once or twice a month 4= a few times a year	***VeryReligious_Dummy** everyone once a week+ coded as highly religious

	5= seldom 6= never 99= refused	**Code:** RECODE REL_ATTEND (1=1) (2=1) (3=0) (4=0) (5=0) (6=0) (99=SYSMIS) (SYSMIS=SYSMIS) INTO VeryReligious_Dummy. VARIABLE LABELS VeryReligious_Dummy 'Respondants religious attendance is once or more per week'. EXECUTE.
RELIG	1= Protestant 2= Roman Catholic 3= Mormon/LDS 4= Orthodox 5= Jewish 6= Muslim 7= Buddhist 8= Hindu 9= Atheist 10= Agnostic 11= Other 12= Nothing in particular 99= Refused	*Recode comb. With born_again → Prot/EA **Code:** RECODE RELIG (1=1) (99=SYSMIS) (ELSE=0) (SYSMIS=SYSMIS) INTO Protestant_Dummy. VARIABLE LABELS Protestant_Dummy 'Respondant identifies as Protestant'. EXECUTE. COMPUTE EvangProt_Dummy=0. IF Evangelical_Dummy=1 AND Protestant_Dummy=1 EvangProt_Dummy=1.
BORN_AGAIN	1= Yes, born-again or evangelical Christian 2= No 99= refused	***Evangelical_Dummy** 1= yes (1) 2= no (2 and 99) **Code:** RECODE BORN_AGAIN (1=1) (2=0) (99=0) (SYSMIS=SYSMIS) INTO Evangelical_Dummy. VARIABLE LABELS Evangelical_Dummy 'Respondant identifies as Evangelical'. EXECUTE.
PARTY	1= Republican 2= Democrat 3= Independent 4= else 99= refused	***Republican_Dummy** 1= Republican (1) 0= not republican (2-4) **Code:** RECODE PARTY (1=1) (2=0) (3=0) (4=0) (99=SYSMIS)

		(SYSMIS=SYSMIS) INTO Republican_Dummy. VARIABLE LABELS Republican_Dummy 'Respondant is Republican'. EXECUTE. ***Democrat_Dummy** 1= Democrat (2) 0= not democrat (1, 3, 4) **Code:** RECODE PARTY (1=0) (2=1) (3=0) (4=0) (99=SYSMIS) (SYSMIS=SYSMIS) INTO Democrat_Dummy. VARIABLE LABELS Democrat_Dummy 'Respondant is Democrat'. EXECUTE. ***Independent_Dummy** 1= Independent (3) 0= else (1, 2, 4) **Code:** RECODE PARTY (1=0) (2=0) (3=1) (4=0) (99=SYSMIS) (SYSMIS=SYSMIS) INTO Independent_Dummy. VARIABLE LABELS Independent_Dummy 'Respondant is Independent'. EXECUTE.
IDEOLOGY	1= Very conservative 2= conservative 3= moderate 4= liberal 5= very liberal 99= refused	***Conservative_Dummy** 1= conservative (ans. 1 or 2) 0= not (3-5) **Code:** RECODE IDEOLOGY (1=1) (2=1) (3=0) (4=0) (5=0) (99=SYSMIS) (SYSMIS=SYSMIS) INTO Conservative_Dummy. VARIABLE LABELS Conservative_Dummy 'Respondant is Conservative'.

		EXECUTE. ***Moderate_Dummy** 1= moderate (3) 0= else (1-2, 4-5) **Code:** RECODE IDEOLOGY (1=0) (2=0) (3=1) (4=0) (5=0) (99=SYSMIS) (SYSMIS=SYSMIS) INTO Moderate_Dummy. VARIABLE LABELS Moderate_Dummy 'Respondant is Moderate'. EXECUTE. ***Liberal_Dummy** 1= liberal (ans. 4 or 5) 0= else (1-3) **Code:** RECODE IDEOLOGY (1=0) (2=0) (3=0) (4=1) (5=1) (99=SYSMIS) (SYSMIS=SYSMIS) INTO Liberal_Dummy. VARIABLE LABELS Liberal_Dummy 'Respondant is Liberal'. EXECUTE.
GENDER	1=male 2=female 3=else 99=refused	***Male_dummy** 1=Male 0= Female or other **Code:** RECODE GENDER (1=1) (2=0) (3=0) (99=SYSMIS) (SYSMIS=SYSMIS) INTO Male_Dummy. VARIABLE LABELS Male_Dummy 'Respondant is Male'. EXECUTE.

RACE_ETHNICITY	1= white non-hispanic 2= black non-hispanic 3= Hispanic 4= other 5= Asian non-Hispanic 99= refused	***White_dummy** 1= white non-hisp 0= else (99 recoded as SYSMIS) **Code:** RECODE RACE_ETHNICITY (1=1) (2=0) (3=0) (4=0) (5=0) (99=SYSMIS) (SYSMIS=SYSMIS) INTO White_Dummy. VARIABLE LABELS White_Dummy 'Respondant is White, non-Hispanic'. EXECUTE. ***Black_dummy** 1= Black non-hisp 0= else (99 recoded as SYSMIS) **Code:** RECODE RACE_ETHNICITY (1=0) (2=1) (3=0) (4=0) (5=0) (99=SYSMIS) (SYSMIS=SYSMIS) INTO Black_Dummy. VARIABLE LABELS Black_Dummy 'Respondant is Black, non-Hispanic'. EXECUTE. ***Other_dummy** 1= ans. 3-5 0= white or Black (99 recoded as SYSMIS) **Code:** RECODE RACE_ETHNICITY (1=0) (2=0) (3=1) (4=1) (5=1) (99=SYSMIS) (SYSMIS=SYSMIS) INTO Other_Dummy. VARIABLE LABELS Other_Dummy 'Respondant is neither White nor Black'. EXECUTE.
AGE	1= 18-29 2= 30-49 3= 50-64 4= 65+ 99=refused	*Recode with 99=SYSMIS **Code:** RECODE AGE (1=1) (2=2) (3=3) (4=4) (99=SYSMIS)

		(SYSMIS=SYSMIS) INTO Age_Edited. VARIABLE LABELS Age_Edited 'Age without refused to answer'. EXECUTE.
EDU	1= less than high school 2= high school graduate 3= Some college 4= Associate's degree 5= college graduate/some post grad 6= post grad 99=refused	*Recode with 99=SYSMIS **Code:** RECODE EDU (1=1) (2=2) (3=3) (4=4) (5=5) (6=6) (99=SYSMIS) (SYSMIS=SYSMIS) INTO Edu_Edited. VARIABLE LABELS Edu_Edited 'Education without refused to answer'. EXECUTE.