Voting Choice as a Predictor in County Level Sexual Orientation and Gender Motivated

Hate Crimes across the United States: A Latent Growth Modeling Approach

Cynthia Blaise

Virginia Commonwealth University

Honors in Psychology

Thesis Chair: Jennifer Joy-Gaba

Professor of Psychology, Department of Psychology

Author Note [1]

Cynthia Blaise https://orcid.org/0009-0009-0860-6983

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[1] All materials pertaining to this proposal can be found at https://github.com/LyraFunction/PSYC499 and preregistration information can be found at https://osf.io/bpkxw

Abstract

Animus towards LGBTQ (Lesbian, Gay, Bisexual, Transgender, and Queer) individuals remains high, exemplified through the growing incidence of hate crimes motivated by a victim's perceived LGBTQ identity. The increase in hate crime incidents may seem incongruous given recent polling data suggesting that attitudes towards the LGBTQ community are growing more positive year over year rather than negative. Recent work has proposed the importance of political factors influencing hate crime incidence in the United States, with jumps in occurrences loosely associated with major political events. Thus, my research seeks to clarify how one such event, the United State's 2016 presidential election, may relate to hate crime incidence for the following four years post-election. To answer my research question, I will assess whether hate crime incidence motivated by LGBTQ identities at a county level differs based on voting results in the 2016 election, such that Republican voting Republican counties have a higher incidence than Democratic counties over a four-year time span. My main analyses will consist of a mixed-effects ANOVA to quantify mean differences in incidence at a group level (Democratic county compared to Republican county) and in mean differences over each time point. The second analysis will consist of a Latent Growth Model capturing intra-county changes in hate crime incidence across 16 timepoints from county election results.

Keywords: Hate Crime, LGTBQ, SOGI, Explicit Prejudice, Discrimination, Intergroup Aggression

Intro

The Supreme Court decision on *Obergefell v. Hodges* (2015), which required all states to license same-sex marriages while also recognizing any marriage licensed legally in other states. Following Obergefell, the GOP platform reaffirmed their opposition to same-sex marriage, explicitly laying out the party's intention to defend what they considered traditional marriage in their 2016 platform (*2016 Republican Party Platform*, 2016). This campaign promise created a rupture between the party and Log Cabin Republicans, one of the largest gay conversative organizations, with their president suggesting the 2016 platform was "the most anti-LGBT[2] platform in the party's 162-year history" (*Log Cabin Republicans on GOP Platform*, 2016).

While Donald Trump initially presented himself as a pro-LGBTQ candidate, especially in light of his opponents in the Republican primary leading up to the 2016 presidential election (Sosin, 2025). Shortly after being sworn in as president, federal agencies began removing mentions of the LGBTQ community (*Trump Administration Removes LGBTQ Content from Federal Websites*, 2017). Two months into Trump's first term, his administration revoked previous guidance protecting the rights of transgender students to use bathrooms that align with their gender identity (Johnson, 2017). Two years into the administration, Ben Carson, then secretary of the Department of Housing and Urban Development, defended the revocation of regulations that protected LGBTQ people from in housing and when attempting to access shelters for the unhoused (*Ben Carson Won't Restore LGBTQ Protections at HUD*, 2019). Ultimately, according to Cahill and Pettus (2020), the Trump administration enacted more anti-LGBTQ policies than any prior administration.

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[2] This study will use LGBTQ (Lesbian, Gay, Bisexual, Transgender, and Queer), but when describing evidence from another source, I adopt the terminology used to avoid potentially overgeneralizing evidence. A more encompassing acronym that is more broadly used would be LGBTQIA+ (Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual, with + referring to all gender/sexual identities not previously defined) ("Defining LGBTQ+," n.d.). I will use LGBTQ, as this acronym most accurately reflects the information provided by the datasets used in the current study.

Population Counts of LGBTQ People

Recent data from the 2020 United States census (US Census Bureau, 2020) reported 1,168,566 same-gender households. This number includes both married couples living together as well as unmarried, same-sex-attracted households. Of these reported households, nearly 75% (878,547) live within the 100 largest metropolitan areas (Spring & Ghaziani, 2024). Independent secondary analysis of the CDC's Behavioral Risk Factor Surveillance System conducted in 2023 suggested a much higher population of nearly 14 million with an average population of 5.5% across all states, including Washington, D.C. (Flores & Conron, 2023).

In comparison to the 2020 census, sampling completed by Gallup (2025) proposed a higher population, with 5.6% of 15,349 identifying as LGBTQ in 2020. Compared to 2016, this figure represented an increase of 1.4% (Gallup, 2025). This increase is largely driven by Gen Z (those born between 1997 and 2006) self-identification; since 2020, the percentage of Gen Z identifying as LGBTQ has increased from 18.8% to 23.1% (Gallup, 2025). On the other hand, older generations decreased in LGBTQ identification roughly by half within each generation, with 14.2% of Millennials identifying as LGBTQ, 5.1% of Generation X, 3% of Baby Boomers, and 1.8% of the Silent Generation (Gallup, 2025). Across all generations, a majority (56%) of the LGBTQ identifying individuals reported being bisexual, while 21% reported being gay, 15% reported being lesbian, 14% reported being transgender, and 6% of individuals reported something else (Gallup, 2025). While the general trend has increased, differences in population sizes exist on a state-by-state basis, with Vermont having the highest percentage of people identifying as LGTBQ at 5.3% in 2016 and South Dakota having the lowest at 2.0% (Gallup, 2017).

The gap between Gallup's sample and the Census data may be explained by the difference in the method of estimation: the census fails to count LGBTQ people living alone or otherwise not in the same household as their partner and overlooks bisexual people who tend to have cross-gendered partners (Pew Research Center, 2013; Wu et al., 2020). Difficulties and inconsistencies in the measurement of population sizes for the LGBTQ community may stem from three sources: the relatively small population of the community (Hughes et al., 2021), fear of disclosing an LGBTQ identity to researchers[3], and confusion among researchers regarding effective wordings on questionnaires for accurate identity assessment (Hughes et al., 2021). While LGBTQ people have been previously suggested to be difficult to survey by official sources (U.S. Census Bureau, 2016), limited evidence substantiates this claim (Bates et al., 2019). Suggesting that perceived barriers in collecting data from these populations may come from a lack of effort or from a lack of desire to include questions assessing LGBTQ characteristics (Cahill & Makadon, 2017).

Explicit Prejudice

LGBTQ identifying people frequently describe experiences of prejudice and discrimination (Meyer, 2003; Hurd & Mahal, 2025), with these experiences occurring as early as childhood (Russell et al., 2012). General support for LGBTQ+ rights has increased dramatically since early measurements, with 68% of polled Americans supporting gay marriage in 2020, compared to only 27% in 1996 (Gallup, 2025). While support for greater legal equality has increased, interpersonal attitudes have been less responsive and remained more negative. (Baunach 2011; Fetner 2016; Loftus 2001).

Often these types of experiences are based within an explicit attitude framework - an attitude that people know or are willing to report (Allport et al., 2015). This type of attitude can

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[3] This may be especially true as it pertains to research conducted by governmental organizations (Pho et al., 2023).

be associated with three parts: a cognitive component based on assumptions about a group (i.e., stereotyping), an affective component relating to the emotions that come about when a prejudiced person interacts with another group, and a behavioral component toward the group (i.e., discrimination) (Jackson, 2020). Research on prejudice tends to use a more unidimensional definition of prejudice, operationalizing prejudice as simply a negative attitude toward one group of people (Hsieh et al., 2022; Paluck & Green, 2009). Newer scholarship has suggested that attitudinal approaches to sexual prejudice may capture two partially overlapping, but distinct, factors of moral disapproval and outgroup antipathy (Mallinas & Plant, 2024).

Between the incorporated groups of the LGBTQ community, differences exist between the relative ratings of each group, with bisexual individuals receiving worse ratings than lesbian and gay individuals (Herek, 2002; Rye & Goldszmidt, 2025). When considering the ratings members of the LGBTQ community receive in comparison to one another, generally transgender individuals received lower ratings than bisexual individuals, who in turn received lower ratings than gay or lesbian individuals (Rye & Goldszmidt, 2025). Attitudes toward LGBTQ tend to vary based on various rater characteristics from age (Flores et al., 2020; Garretson, 2015), religious identity (Olson et al., 2006), emotional disgust (Gadarian & van der Vort, 2018; van Leeuwen et al., 2023; Wang et al., 2019), level of education (Budge, 2023; Flores, 2015), as well as gender (Flores et al., 2020; Herek, 2002; Kaufman & Compton, 2021; Rye & Goldszmidt, 2025). While religiosity (how often one attends religious services) may play an important role in explaining prejudicial attitudes targeting LGBTQ people (Rye & Goldszmidt, 2025), recent evidence suggests a more complex relationship depending on how accepting of LGBTQ people churchgoers perceive their church to be (Valen & Burke, 2025b).

Right-Wing Authoritarianism (RWA) and Social Dominance Orientation (SDO) are two constructs that are frequently examined in prejudicial research. These constructs are now more frequently identified as two dimensions of motivating factors that influence individuals' prejudice toward specific groups (Duckitt & Sibley, 2010). The first dimension, (RWA), measures one's submission to authority, adherence to traditional moral systems, and directed aggression towards outsiders (Altemeyer, 1981). The second dimension (SDO) is a measure of one's preference for a society that espouses hierarchy and inequality (Pratto et al., 1994), consisting of two distinct subdimensions (Ho et al., 2012). Each subdimension is highly correlated to one another but distinctly measures one aspect of the measure, with SDO-D measuring preference for group-based dominance and SDO-E assessing an aversion of equality (Ho et al., 2012). RWA and SDO have previously been thought of as personality traits due to their observed stability, but may more accurately be considered sets of stable social attitudes (Osborne et al., 2021). Both RWA and SDO share weak to strong associations with prejudicial attitudes towards LGBTQ individuals depending on the sample (e.g., Hatch et al., 2022; Tebbe & Moradi, 2012; Valen & Burke, 2025a; Whitley & Ægisdóttir, 2000).

Reducing Prejudice

Explicit prejudice tends to respond favorably to interventions intended to reduce it (Jayawickrama et al., 2025). Much of the previous literature on prejudice has examined how prejudice can be reduced, with significant attention paid to intergroup contact (e.g., DellaPosta, 2018; Hoffarth & Hodson, 2018). Previous meta-analytic evidence suggests a moderate but consistent reduction resulting from interactions with outgroups (Pettigrew & Tropp, 2006). These reductions through contact with an outgroup appear to result from enhancing knowledge of,

increasing empathy toward, and decreasing anxiety from contact with the outgroup (Panerati & Salvati; Pettigrew & Tropp, 2008).

Intergroup contact is not constrained to direct person-to-person interactions. While the effect is generally weaker compared to direct interactions, contact via media representations of target groups can effectuate prejudicial attitude reduction (Madžarević & Soto-Sanfiel, 2018). For example, contact with one member of the LGBTQ community may also function to reduce prejudicial attitudes towards other members through a positive secondary transfer effect, such as contact with a gay man reducing prejudice towards transgender men (Fitzgerald et al., 2024).

Intergroup contact is by no means a total prophylactic to prejudice, as all forms of contact are not equal, with the quality of contact appearing to have a stronger influence on reducing prejudicial attitudes than the quantity of contact events (Kanamori et al., 2022). Furthermore, the valence of contact plays a role, with negative interactions worsening attitudes and positive interactions bettering them (Affinito et al., 2023; Barlow et al., 2012). While reductional interventions for prejudice remain valuable, the malleable nature of prejudice also results in the possibility of prejudice increasing in response to certain events or experiences. One such way prejudice may be increased is by a negative secondary transfer effect, whereby prejudicial attitudes towards one outgroup generalize to another not immediately relevant outgroup (Affinito et al., 2023).

LGBTQ Experience of Hate Crimes

Many previous studies have reported situations and contexts in which LGTBQ individuals face discrimination, such as acquiring housing (Glick et al., 2020), receiving health care (Puckett et al., 2018; Wall et al., 2023; Winter et al., 2016), and employment (Eames, 2024; James et al., 2016). LGBTQ people also face the possibility of hate crimes, or criminal

victimizations motivated by their identity, with experiences of hate crimes being relatively common among LGBTQ populations, especially for transgender individuals (Lombardi et al., 2002). Compared to the non-LGBTQ population, those identifying as LGBTQ are more likely to experience some form of victimization and are more than twice as likely for those victimizations to be bias-motivated (Flores et al., 2022). As with other forms of discriminatory experiences, those who experienced gender or sexual bias-motivated crimes were at higher risk to emotional harm and later physical harm (Holder, 2024).

Scholarship studying hate crimes has grown as data has become increasingly available and accessible, in large part due to governmental efforts to track crimes motivated by LGBTQ identity. Although an international definition of what constitutes a hate crime remains elusive (Vergani et al., 2024), research on hate crimes conducted in the United States commonly adopts the definition provided by Congress, which states that a hate crime is "a criminal offense against a person or property motivated in whole or in part by an offender's bias against a race, religion, disability, ethnic origin, or sexual orientation" (Public Law 101-275, 1990). After expanding hate crime legislation to consider bias towards transgender individuals, transgender individuals reported increased reported support from families and the amount of people transgender people disclosed their identity to (Cramer et al., 2025).

While legislation has made large strides in researchers' ability to examine hate crime incidents in the United States, issues with underreporting remain pervasive (Giannasi & Hall, 2016). Indeed, analysis of the FBI's hate crime dataset from 2015 among all bias types suggested that victims were 6.2% less likely to report a crime if it was bias-motivated and 17.1% less likely to report incidence to police compared to non-bias-motivated crimes (Pezzella et al., 2019).

Underreporting may stem from fears that reporting hate crimes would result in further

victimization (Haymes et al., 2000.; Peel, 1999).

Overall, hate crimes targeting LGBTQ people tended to increase in severity for

increasing group minority status, such that LGBTQ women experience more severe hate crimes

than their male counterparts, while non-white LGBTQ people experienced on average the most

severe hate crimes (Coston, 2018). Additionally, recent evidence suggests that in comparison to

religious, ethnic, or racially motivated hate crimes, crimes motivated by LGBTQ identities tend

to be committed by people known to the victims[4], those under the influence of alcohol, or

multiple perpetrators (Kehoe, 2020). Hate crimes motivated by LGBTQ identity are also more

likely in rural areas as compared to urban areas (Piatkowska & Messner, 2022), concordant with

general beliefs and reports regarding the acceptability of LGBTQ identification in rural areas

(McKay et al., 2024). Research on the characteristics of hate crime offenders is limited, but

among a sample of inmates in Spain those imprisoned for bias-motivated crimes were higher in

generalized prejudice, homophobia and SDO than those imprisoned for non bias-motivated

crimes (Pérez Ramírez et al., 2025).

The damage inflicted from suffering a hate crime tends to go beyond physical harm, with

those victimized by bias-motivated crimes more likely to report experiencing psychological

trauma (Fetzer & Pezzella, 2019). Among a sample of gay, bisexual, and other men who have

sex with men, experiences of violence increased the likelihood of posttraumatic stress disorder

features when participants attributed the experience to being motivated by their sexual identity;

this was especially true for teenagers (Wiginton et al., 2023). For LGBTQ who have experienced

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[4] Victim-perpetrator acquaintance may be a recent development, as older analysis of the relationship between LGBTQ victims of hate crimes and their perpetrators suggested that they were less likely to be victimized by those known to them rather than more (Herek, 2002). Another cause may be the expansion of coverage provided by hate crime legislation; to my knowledge, no scholarship has examined if the relationship between victims and perpetrators is associated with any particular gender or sexual identity.

a hate crime personally, increases in anxiety and stress may be in part due to an internalization of homophobia (Burks et al., 2018). Furthermore, LGBTQ people who had direct experiences of hate crimes tended to have a decreased level of empathy towards others who experience hate crimes, as well as increased shame, anxiety, and feelings of vulnerability (Paterson et al., 2019).

Evidence on the motivations of hate crime perpetrators remains limited, but previous research by McDevitt et al. (2002) suggested that while bias-motivated crime perpetrators are motivated by an underlying bias against the target group, a majority of offenders were motivated by an additional desire to engage in thrill seeking via the act. A smaller proportion of perpetrators were motivated by their desire to "rid the world of groups they considered evil or inferior" or a desire to exact revenge upon the target group for a real or perceived crime inflicted upon the perpetrator's group (McDevitt et al., 2002).

Politics as a Vehicle for Social Norm Change

Following the 2016 election, a noticeable jump occurred in reported hate crimes (Edwards & Rushin, 2018), along with reporting suggesting that hate crime occurrence also increased in the specific counties in which Trump hosted his rallies (Feinberg et al., 2022). Crandall et al. (2018) found that compared to measures from before the election participants, regardless of whom they supported in the election, reported increased levels of prejudice towards groups targeted by Trump. Among Trump supporters the observed increase was more pronounced compared to Clinton supporters, despite both groups having similar prejudice scores prior to the campaign (Crandall et al. 2018). Additionally, a prejudicial blind spot appeared, as while these participants scored higher on prejudice towards targeted groups, they perceived themselves to be less prejudiced than others (Crandall et al. 2018).

In response to the Supreme Court's decision in the Obergefell case, the perception of social norms shifted towards a more positive LGBTQ perception, without notable changes in individual attitudes (Tankard & Paluck, 2017). Likewise, research on the influence of state-level constitutional bans on same-gender marriage and hate crime incidence targeting LGBTQ individuals suggested a positive correlational relationship (Levy & Levy, 2017). Conversely, legal protections for same-gender marriage appear to be negatively associated with LGBTQ bias-motivated crime incidence (Nikolaou, 2022). Policies outlawing discrimination in the workplace on the basis of LGBTQ identities is also negatively associated with bias-motivated crime incidence. (Levy & Levy, 2017). Social norms may play an explanatory role in how individual attitudes pertaining to prejudice actualize, as among Trump supporters in a series of longitudinal studies prejudice towards groups targeted by the Republican candidate increased (Ruisch & Ferguson, 2022).

Compared to previous presidential elections, authoritarianism played a key role among voters in the 2016 election, with those high in the personality trait being over 50% more likely to vote for Donald Trump (Knuckey & Hassan, 2022). Furthermore, compared to those who opposed Donald Trump, those who favored him were significantly more likely to oppose gay marriage, legal protections for LGBTQ people, and support exceptions to anti-discriminatory policies for small businesses (Kaufman & Compton, 2021). Higher SDO and RWA relate to favorability and intention to vote for Trump election and lower intention to vote for Clinton in the 2016 (Choma & Hanoch, 2017). This relationship continued into the 2020 election, with SDO and RWA again predicting favorability and intention to vote for Trump (Godbole et al., 2022).

Authoritarianism has been presented as particularly important in understanding support for Trump, potentially eclipsing demographic characteristics (Macwilliams, 2016). High levels of RWA tend towards submission to authority figures. Thus, it is possible that those high in RWA, who simultaneously condemn hate crimes towards LGBTQ people, may experience an interpersonal shift in attitudes if they believe that political figures within their party have shifted to a less LGBTQ accommodating stance. Those high in SDO on the other hand, if they do not already hold a poor attitude toward LGBTQ individuals, may see a shift due to an increasing salience of the marginalization of LGBTQ identity exemplified through political rhetoric. Trump and the Republican party writ large may have been appealing to those high in authoritarianism due to repeated appeals to core triggers to authoritarianism such as the perception of outside threat (Feldman & Stenner, 1997). Perceptions of symbolic threat, which can be induced through manipulations of demographic size, in turn predict prejudicial attitudes toward LGBTQ people (Mackey & Rios, 2025). One manifestation of threat may be the perceived size of LGBTQ groups, which has some association with hate crime incidence motivated by LGBTQ identity (Piatkowska & Messner, 2022).

The Current Research

This study aims to expand upon the current body of evidence by examining how a large socio-cultural event such as the 2016 election may have shifted social norms regarding the status of LGBTQ people. This shift may have fostered an environment where hate crimes began to appear more acceptable across the political spectrum, but, due to the differential voting patterns on a county-by-county basis, would have been experienced differently among county inhabitants. The "new" social norm would consequentially then manifest as a differential level of hate crimes motivated by LGBTQ identities. Over time this gap may widen over time as Trump and his

administration passed new policies that targeted LGBTQ rights, reaching its peak in the final year of his administration. To examine this theory I propose the following three hypotheses:

H_1: Counties that voted for the republican candidate in the 2016 federal election will have a higher average of hate crimes motivated by a LGBTQ identity compared to counties that voted for the democratic candidate.

H_2: The average amount of hate crimes motivated by LGBTQ identities across all counties in the United States will increase compared to the preceding timepoint.

H_3: County-level Republican vote majority in 2016 will positively predict both the intercept and slope of LGBTQ bias-motivated crimes, such that Republican-voting counties have higher initial levels of incidents and steeper growth over time than Democratic-voting counties.

I will also test one exploratory hypothesis:

E_1: Crimes motivated by anti-transgender and anti-gender non-conforming bias will be significantly higher than those motivated by anti-bisexual bias which will be significantly higher than those motivated by anti-lesbian or anti-gay bias at each timepoint

Should I find evidence of my hypotheses, my study would shed light on the mechanics of hate crime incidence targeting LGBTQ individuals, where incidence is the most prevalent, and the rate of any increased incidence over time. This data is especially important given that incidents of discriminatory experiences are likely contributors to deleterious mental (Almeida et al., 2009; Amadio, 2006; Bailey, 1999; Fredriksen-Goldsen et al., 2014) and physical (Fredriksen-Goldsen et al., 2014; Miller & Denise, 2015; Saghir et al., 1970) effects among LGBTQ individuals, or even those simply perceived to be LGBTQ.

Method

Election Data

Data on election outcomes comes from the MEDSL election returns dataset on United States presidential election results by county, using the data for the 2016 presidential election (MIT Election Data and Science Lab, 2018). The MEDSL dataset includes county-level vote totals for every state plus DC for the two major political parties, as well as an additional row for "other" candidates. The dataset also includes data on every presidential election from 2000-2024, but only the 2016 election data will be used. Of the total 3158 counties included in the 2016 election, 3155 will be used for analysis. The three excluded counties are from Connecticut, Maine, and Rhode Island, which have a separate row counting votes from those in the military deployed internationally, or out-of-state voters.

Hate Crime Data

This study will use the 2017-2020 hate crime incident data released by the FBI (United States Department of Justice. Federal Bureau of Investigation, 2022a, 2022b, 2023a, 2023b). The Uniform Crime Reporting Program (UCR) program defines hate crimes as any criminal offense that is at least partially motivated by the victim's race, religion, disability, sexual orientation, ethnicity, gender, or gender identity (United States Department of Justice. Federal Bureau of Investigation, 2022a). Importantly, even if the offender is mistaken about the victim's identity (i.e., the offender believes the victim to be bisexual despite them being straight), the crime is recorded as a hate crime motivated by the perceived identity of the victim (United States Department of Justice. Federal Bureau of Investigation, 2022a).

The FBI began collecting data on hate crimes following the passage of the 1990 Hate Crime Statistics Act, which required the agency to collect hate crime statistics with the ongoing

UCR Program (Public Law 101-275, 1990). Since the agency began its hate crime reporting,

several changes have occurred, increasing the types of bias covered, with bias against the

disabled tracking beginning in 1997 and again in 2013 with the beginning of coverage for hate

crimes motivated by gender, gender identity. In total, 27 motivations of bias are considered,

broadly falling into the categories of race/ethnicity, religion, sexual orientation, disability status,

gender, or gender identity.

While the UCR program has provided a great deal of information on the occurrence of

hate crimes across the United States, agency participation in the program is voluntary, potentially

leaving gaps in coverage. Of the 18,623 policing-involved agencies (*Community Relations*

Service | 2020 FBI Hate Crimes Statistics, 2021), only 16,149 participated in hate crime data

collection in 2017 (*Hate Crime by Jurisdiction*, 2017). Agency participation fell 15,136 in 2020

(*Community Relations Service | 2020 FBI Hate Crimes Statistics*, 2021). However, following a

change in the FBI's reporting system, population coverage fell to 70% for the duration of 2021

before recovering in 2022. Due to the incomplete coverage, some counties may be entirely

missing data, possibly leading to a more limited sample size for data analysis. While agency

participation fell, population coverage is consistently reported at around 95% from 2017 to 2020

(*2017 Hate Crime Statistics Released*, 2018).

Data Preparation

Due to the size and complexity of the datasets being used, I will utilize code written in

Python with the Pandas (The Pandas development team, 2025) and NumPy (Harris et al., 2020)

libraries for data manipulation. Using Python will ease the process of combining all the data used

for this study. In total, nine separate data sources will be merged into one larger dataset. Each

dataset contains a FIPS code that denotes a specific county in the United States (*ANSI and FIPS*

Codes, n.d.). Using these codes, I will connect each dataset to one another. This larger dataset will contain all the pertinent data for use in the data analysis. From the MEDSL dataset, I will copy the county name, containing state, the party that won a given county (dummy-coded as 0-Democrat, 1-Republican), as well as the total votes each party received. The FBI UCR dataset contains two files; the first is a header file that contains every county that the FBI received information on, while the second file contains specific information on incidents. From the header file, I will copy the county's population, if the county experienced any hate crime reports, which quarter any incidents took place in, and the incident number if any exists. Finally, from the incident file, I will copy the incident motivation(s) and the quarter in which the incident took place.

Data Analysis Plan

All analyses will be performed in R (v4.4.2; R Core Team 2024), and within the data I plan to conduct descriptive analysis (mean, standard deviation, range, skewness, and kurtosis) for each bias motivation (anti-gay, anti-lesbian, general anti-LGBTQ, anti-bisexual, anti-transgender, anti-gender nonconforming) across each year of analysis. I will also construct a correlation matrix associating each bias motivation with one another. For my exploratory hypothesis, I will use a one-way ANOVA to compare each category of bias for each year, and if significant differences exist, I will use a tukey-test to determine rank differences.

Mixed-Effects ANOVA

To test hypotheses one and two, I will use a mixed-methods ANOVA. Using G*Power 3.1 (Faul et al., 2007), a sample effect size of .1 with 2 groups over 4 measurement points with a correlation of .2 results in a required sample size of 1116, far lower than my provided sample of 3155. A mixed-effects ANOVA allows the comparison of average group differences (Republican

vs. Democratic counties in this case) as well as comparisons of these groups across each timepoint. Hate crime incidence data tends to be zero-inflated; thus the data may be unsuitable for use in a mixed-effects ANOVA. If zero-data is an issue, to test hypotheses two and three I will instead use Bonforreri corrected t-tests. When testing hypothesis one, to detect an effect with a two-sample t-test with unpaired groups, a directional test with a critical value of .01 and a power of .95 I would need a total sample size of 256 with 128 participants per group. For hypothesis two to detect an effect with a two-sample paired t-test, I would need a sample size of 66.

Latent Growth Model

To test hypothesis three, I will use Latent Growth Modeling (LGM) with the lavaan package in R (Rosseel et al., 2012). LGM is an implementation of Structural Equational Modeling (SEM) that handles the analysis of longitudinal data, capturing the growth trajectory of a variable over a set period of time. Thus, for this study using LGM allows for the examination of potential changes in hate crime growth over a set period on the results of county-level voting. My conceptual model (see Figure 1) consists of one categorical predictor variable, the voting results for a given county in the 2016 election, where 0 signifies a democratic majority and 1 indicates a republican majority, two latent variables—the slope and intercept for changes in hate crimes—and 16 indicators consisting of the four quarters of hate crime reports targeting LGBTQ individuals across the four years of interest (2017, 2018, 2019, 2020).

Figure 1.

Conceptual diagram of Latent Growth Model
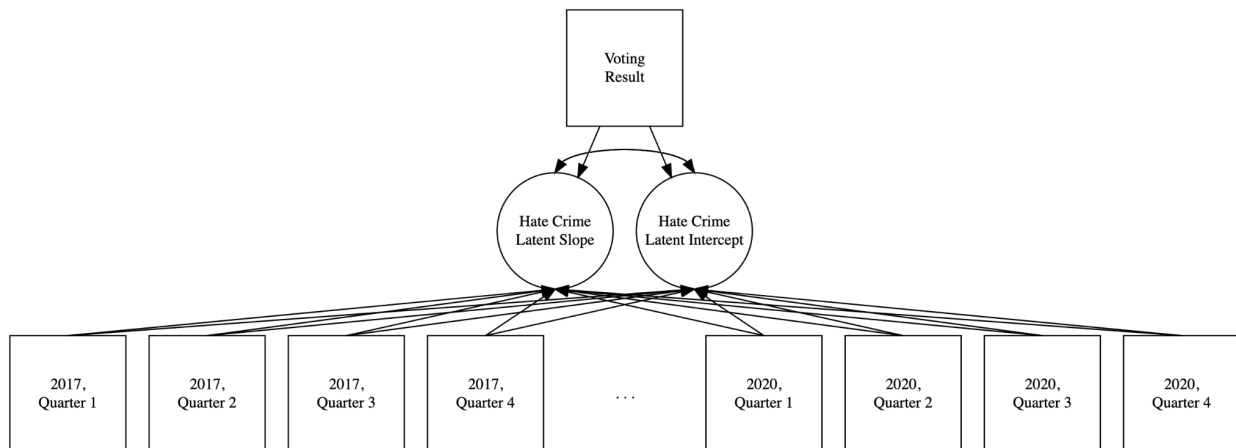
A LGM measures intra- and inter-county change in hate crime incidence, allowing for a robust analysis of any potential change in observed incidence. Although there is a significant degree of mathematical resemblance between mixed-effect ANOVAs and LGMs (McNeish & Matta, 2018), the addition of a LGM to a mixed-effects ANOVA enables a more robust management of measurement error. This is due to LGM's basis in SEM, which addresses measurement error through the modeling of latent variables (Office for National Statistics (ONS), 2022). By modeling the latent intercept and slope, I can account for situations where growth in hate crime incidence (or lack thereof) is due to greater or lesser starting incidence (Duncan & Duncan, 2009). Additionally, LGM has greater flexibility regarding data with a pronounced percentage of zeros (Seddig, 2024).

Due to the relative simplicity of my theorized model and the currently unclear characteristics of what constitutes an adequate sample size, I have chosen not to perform an a priori power analysis as my sample exceeds the general recommendations found in the literature, suggesting more than 500 participants for small effect sizes (Fan, 2003). Previous research examining bias-motivated incidence following Trump's election found large effect sizes ($r^2 > .6$) for 2017 and 2018 (Edwards & Rushin, 2018), suggesting that power will not be a primary cause

of concern. Should my model fail to converge, I will instead use a generalized linear

mixed-model.

Missing Data

Once the datasets have been merged, I will check for missing data. All the datasets used

in this study report having been checked for missing data, suggesting missing data may be the

result of the dataset merger process. If the missing data is not erroneous, I will use full

information maximum likelihood estimation, a method for data imputation commonly used with

SEM (Cham et al., 2017).

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