

It's a Bird, it's a Plane, it's Superman!

Using Mass Media to Fight Intolerance*

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Abstract

This paper examines the impact of progressive radio programming on societal change during the early period of desegregation in post-World War II U.S. We investigate the influence of the popular radio show *The Adventures of Superman* on promoting tolerance and exposing the bigotry of the Ku Klux Klan (KKK) in 1946. Using state-of-the-art radio propagation models, we map the broadcast's exposure and analyze its effects on various socioeconomic outcomes. We find that counties with higher exposure to the broadcast experienced a significant decrease in support for segregationist political candidates. Individuals potentially exposed to the Superman program during their youth exhibited more progressive attitudes towards racial desegregation and African Americans later in life. These individuals were also more likely to be in interracial marriages and less likely to participate in the Vietnam war. Additionally, we uncover significant and progressive long-term effects of the radio coverage on county-level outcomes such as the presence of active KKK branches, civil rights organizations, and accessibility of non-discriminatory services for African Americans listed in the "Green Books." These results underscore the potential of progressive radio programming as a catalyst for social change and contribute to our understanding of how media shapes societal attitudes and beliefs. (*JEL* D7, D83, J15, L82, N32, Z18)

Keywords: Mass Media; Radio; Segregation; Ku Klux Klan; Superman; Intolerance; Civil Rights; Racism.

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“In the end prejudice means that you lose out. If you don’t give every boy and girl a chance to prove what kind of people they really are, then you’ll wind up missing some very fine friendships with some very swell people. It’s as simple as that.”

Superman

1 Introduction

Intolerant attitudes, prejudice and discrimination are often a matter of life and death for historically disadvantaged ethnic and racial minorities. They are consequential in social interactions, but also structure inequality before the state. Approximately one out of every 1,000 Black men in the United States (U.S.) are killed by the police during their lifetime in contrast to one out of every 3,000 white men and one out of every 7,500 Asian men experiencing deaths in the hands of the police (Edwards et al., 2019). Beyond the direct lives lost, such violence also has knock on negative effects on educational outcomes and the psychological well-being of minority children (Ang, 2021) and the mental health of the general minority population (Bor et al., 2018). Furthermore, a large body of research has additionally documented the negative consequences of prejudice and discrimination on education (Carlana, 2019), labour markets (Glover et al., 2017), health care (Alsan and Wanamaker, 2018) and income mobility (Chetty et al., 2020).

Despite the well-established and undeniable pernicious consequences of prejudice, effective policies for combating prejudice against minority individuals are shockingly scarce and difficult to devise (Bertrand and Duflo, 2017). In this context, we provide historical evidence of how a popular children’s radio program – *The Adventures of Superman* – broadcast in the 1940s U.S. was able to do just that by attacking intolerance and prejudice head on.

We focus on a period in history when television had not yet become widespread, and radio emerged as the dominant “mass medium” in the U.S., exerting significant cultural influence across society. In this context, the radio program *The Adventures of Superman*, featuring the popular DC Comics character Superman, began airing in 1940 on one of the largest American commercial radio networks, the Mutual Broadcasting System (known as Mutual or MBS). Airing three to five times a week, Superman quickly became one of the most popular entertainment programs for children and young adults at the time.

In 1946, MBS embarked on a remarkable experiment in the history of radio broadcasting called *Operation Intolerance*.¹ Following the decision of the show’s producers and its sponsoring company Kellogg’s, the show’s thematic content suddenly shifted to episodes centered around themes of justice and tolerance, embodying the foundational principles of an inclusive American society. The new episodes particularly emphasized communal harmony among children of all races and ethnic backgrounds. Some episodes explicitly targeted hate organizations such as the Ku Klux Klan (KKK) and their supremacist ideology. The KKK was “the most prominent hate-based organization in American history” (Fryer Jr and Levitt, 2012).² Those episodes specifically demystified the “secret” organization, exposing their rituals, code words, and bigotry to a national audience.

“Operation Intolerance” proved to be a tremendous success for the series, making *The Adventures of Superman* the highest-rated radio program for children. It even received an endorsement from former U.S. Vice President Henry A. Wallace, who stated that using Superman to teach children about the principles of tolerance and equal opportunity for all races, creeds, and colors was a crucial aspect of democracy. The effectiveness of the Superman radio program in 1946 – for instance, in obstructing the KKK’s progress in the U.S. – has also been discussed in academic circles (see, for example, Levitt and Dubner, 2005, pp.49-78, and Bowers, 2012). Despite popular belief and anecdotal evidence of its effectiveness, the effects remain unsubstantiated by empirical evidence. This paper aims to fill this gap.

We collected historical data from the U.S. and used state-of-the-art radio propagation models to create detailed maps of (plausibly exogenous) exposure to the broadcast of *The Adventures of Superman* on the MBS network. Employing Differences-in-Differences (DiD) at the U.S. county level as well as cohort study designs at an individual cohort level, we establish persistent short-term and long-term effects of the radio program on three distinct sets of outcomes.

First, we find that the programs boosted discussion around the KKK and other themes related to tolerance, with discussions increasing immediately during the broadcasts. A text analysis on 8.3 million pages from 1649 digitized newspapers shows that the Superman radio show increased the salience of terms associated with Superman, KKK and intolerance in public discourse. While the program targeted children, its impacts spilled over to adults through promoting a discourse around

¹This term does not appear in internal documents of the program. We adopt this term from the media. Appendix Figure B5 provides evidence on its use in local newspapers of that time.

²For further reading on the KKK refer to Kennedy (2011).

tolerance and progressive values in other spheres.

Second, we find that exposure to the Superman program also had an immediate effect on adults' political behavior, reflected in voting decisions. In particular, we show that in areas where the broadcasts reached, candidates across the Deep South who were likely to be segregationists lost votes. We hypothesize that the increased salience of topics of tolerance can explain why a children's program affected voting decisions of adults.

Third, we find long-term persistent effects of the program on attitudes and preferences towards racial segregation among individuals who were exposed to these programs as children. In particular, we find that, later in life, individuals who were exposed to the series are less in favor of segregation, have improved self-reported feelings towards African Americans, and are more likely to be in interracial marriages compared to individuals who were either not exposed to the program or not targeted by the program.

These effects on attitudes and preferences translated into long-run behavioral change as well. We find effects on social mobilization as measured by participation in the Vietnam War, one of the most important events for the generation born in the 1940s. Objections to the war were closely related to support for the Civil Rights Movement in 1960s America, with many civil rights leaders openly discouraging participation. We find that exposure to the Superman series in 1946 significantly reduces individual participation in the conflict. This is in line with the previous finding that Superman had practical political consequences, as shown in reduced votes for segregationist candidates.

Finally, we also show that Superman has an effect more broadly on social mobilization in the short and the very long run. Exposure reduces racial segregation in the short run, as captured by increases in the number of African American-friendly establishments. In addition, it reduces the presence of hate-based organizations such as the KKK, while increasing the presence of organizations championing civil rights. These effects persist to current times.

Our paper contributes to several distinct strands of the literature. First, we join a literature highlighting how film and media can alter societal attitudes and behavior. Many recent contributions document the intolerance- and hatred-generating effects of media. For instance, while the influential 1915 American motion picture – “The Birth of a Nation” was instrumental in the nation building efforts of the U.S. ([Esposito et al., 2023](#)), it also had a persistent negative influence

on racial discrimination against African Americans (Ang, 2023).³ In addition, radio has been instrumental in fomenting exclusionary attitudes and behavior, promoting antisemitism in the U.S. (Wang, 2021), political mobilization in favor of the Nazi regime in Germany (Adena et al., 2015), ethnic hostility in Croatia (DellaVigna et al., 2014), and genocide in Rwanda (Yanagizawa-Drott, 2014). Recent studies have also documented a similar ability of social media to incite deleterious behaviors such as racial violence (Bursztyn et al., 2019; Müller and Schwarz, 2020, 2021). In sharp contrast, we demonstrate that radio can be a force for good. In particular, we show that *The Adventures of Superman* program had a short-term and long-run positive effect on tolerance and attitudes. To the best of our knowledge, no other papers have demonstrated the long-run consequences of a radio show on tolerance and positive racial attitudes.⁴

Our findings also align with the socially beneficial effects of *edutainment* programs on attitudes and behaviors documented in a growing literature (Gentzkow and Shapiro, 2008; Jensen and Oster, 2009; Chong and Ferrara, 2009; La Ferrara et al., 2012; Banerjee et al., 2015; Ravallion et al., 2015; Bursztyn and Cantoni, 2016; Kearney and Levine, 2015, 2019). In a related paper, Riley (2022) shows how role models in films can improve exam performance of female students. The documented impacts in these papers usually are unintended by-products of audience demand for amusement (DellaVigna and La Ferrara, 2015). In contrast we provide rare evidence of a radio-based intervention that promoted intergroup tolerance and reduced racial animus.

We also contribute to the literature that seeks policies for promoting intergroup tolerance. Most of this literature has focused on experimental interventions, for instance, of the type that increases intergroup contact, which in turn is expected to reduce intergroup antagonism and promote tolerance, in line with contact theory (Allport, 1954).⁵ Despite the fascinating insights of these experimental papers, the interventions are unfortunately not always scale-able. In contrast, our evidence points to a low-cost radio program (already at scale in the population targeted) that can shift attitudes and behavior with long-term persistent positive effects. Our research also relates to the recent lab-in-the-field evidence from developing countries on how media can be used to build inter-ethnic harmony (Blouin and Mukand, 2019; Paluck and Green, 2009; Paluck, 2009). How-

³It promoted the Lost Cause narrative – a revisionist and racist interpretation of the U.S. Civil War that romanticized the Confederacy and portrayed it as a noble defender of states’ rights, downplaying the role of slavery in the conflict.

⁴For a review of the vast literature studying the effects of media on social and political outcomes see Strömberg (2015); DellaVigna and La Ferrara (2015) and Campante et al. (2022). For short run positive effects on rebel demobilization and conflict resolution see Armand et al. (2020). Likewise, Gagliarducci et al. (2020) show how BBC radio was instrumental in garnering anti-Nazi resistance in Italy.

⁵See Bertrand and Duflo (2017) for a review of the literature.

ever, compared to the existing literature, the intervention that is the focus of our research takes place in a real-world context, where external validity is assured by its nation-wide nature.

Finally, we contribute to a burgeoning literature on economic history that demonstrates the long-term persistent effects of historical natural experiments. For instance, [Voigtländer and Voth \(2012\)](#) demonstrate the persistent effects of plague-era anti-Jewish pogroms on antisemitism in Nazi Germany. Similarly, [Bazzi et al. \(2020\)](#) highlight how frontier geography affects rugged individualism centuries later. Furthermore, [Durante et al. \(2019\)](#) demonstrates how the expansion of Berlusconi’s media network in Italy predicts the future success of his right-wing party. Lastly, closely related to our paper is the previously mentioned work by [Ang \(2023\)](#), which demonstrates the long-run effects of the American motion picture “The Birth of a Nation” on racial animus.⁶ We join these papers with evidence on a new type of experiment.

2 Background

2.1 Racial segregation in the 1940s U.S. and the rise of the Civil Rights Movement

During the 1940s, severe racial segregation persisted throughout most of the U.S. Resistance to integration was engrained in mass attitudes among many white Americans, resulting in diffused discrimination, violence and intimidation. Segregation was also often encoded in law. The Jim Crow laws in the Southern states, ratified in the late 1800s, imposed segregation in public facilities and imposed harsh voting restrictions on African Americans. The combined effect was the persistence of economic, social, and political disenfranchisement among the formerly enslaved and other minority groups.

The ultimate expression of this racial animus is the KKK, a white supremacist hate group and terrorist organisation. After its operations curtailed for the second time during WWII, the KKK experienced a revival during the later 1940s, thriving on the uncertainties and fears of the post-war period.⁷ Commonly referred to as the “third Klan” in the late 1940s, 50s and 60s, several branches emerged opposing the Civil Rights Movement and desegregation. Although many pub-

⁶A related literature has documented the importance of historical institutions on contemporary racial prejudice and intergroup conflict ([Jha, 2013](#); [Satyanath et al., 2017](#)).

⁷The “second Klan” emerged in 1915 in Georgia, under the leadership of William Joseph Simmons, and was largely attributed to the success of the film *The Birth of a Nation* (see, e.g., [Ang, 2023](#)). Its membership reached an apex in the mid-1920s, ranging from three to eight million individuals.

lic figures publicly opposed it, at the time there was limited understanding of the organization's societal involvements, implicit objectives and internal operations.

Significant progress towards civil rights began to emerge in the subsequent decades, particularly during the Civil Rights Movement of the 1950s and 1960s. Key milestones included the landmark 1954 Supreme Court decision in *Brown v. Board of Education of Topeka*, which rendered racial segregation in public schools unconstitutional; the 1964 Civil Rights Act prohibiting discrimination in employment, education, and public accommodations; and the 1965 Voting Rights Act, which eliminated barriers to voting, such as literacy tests. These achievements marked pivotal advancements in dismantling racial segregation and advancing equal rights in the U.S.

The rise of the Civil Rights Movement in the 1960s is concomitant with one of the most polarizing events in the 20th century U.S., the Vietnam War (1955–1975). The U.S. government's deep involvement faced mass public dissent in the form of debates and protests questioning the moral and political grounds of its continued engagement from as early as 1963. Proponents of the war viewed it as a means to promote democracy and freedom, and protect American values by defeating communism. To some of these supporters, the Civil Rights Movement posed a parallel challenge to these values, as it confronted existing power structures and racial hierarchies, and invoked communism or communist principles. Opponents of the war saw it as a symbol of oppressive and unjust government policies, with clear links to injustices the Civil Rights Movement sought to rectify.

In this context, the Civil Rights Movement gained momentum as the conflict intensified in the 1960s, with the two becoming closely linked. Prominent civil rights leaders such as Muhammad Ali and Martin Luther King, Jr were openly opposed to the conflict.⁸ Several civil rights activists also criticized the war by arguing that the resources allocated for it could be better utilized to address poverty and inequality through domestic programs. For instance, in 1967, Martin Luther King, Jr. reported that “millions of dollars can be spent every day to hold troops in South Vietnam and our country cannot protect the rights of Negroes in Selma” ([King Encyclopedia, 2018](#)). Further, prominent civil rights organizations officially opposed the Vietnam war.⁹

⁸Ali famously said: “And shoot them for what? They never called me [n-word], they never lynched me, they didn't put no dogs on me, they didn't rob me of my nationality, rape and kill my mother and father. [...] Shoot them for what? How can I shoot them poor people? Just take me to jail” ([The Washington Post, 2018](#)).

⁹For instance, according to the Student Nonviolent Coordinating Committee (SNCC), blacks should not “fight in Vietnam for the white man's freedom, until all the Negro people are free in Mississippi.” ([amistadresource.org](#)). For further reading, see [Harrison \(1996\)](#); [Lucks \(2014\)](#); [Shapiro \(1989\)](#).

2.2 *The Adventures of Superman* and Operation Intolerance

Before the advent of television in the late 1950s, radio served as the predominant “mass medium” in the US, exerting significant cultural influence on the country reaching into the entire spectrum of American society. As of 1946, television ownership was limited to a mere 8,000 U.S. households (Anderson, 2005). Meanwhile, the proportion of households with a radio receiver grew to 96% by 1950 (Craig, 2004). During the “golden age” of radio, four major networks competed on a national scale for market shares, broadcasting original programming.

In this context, the radio program *The Adventures of Superman*, featuring the DC Comics character Superman, started airing in 1940. From August 31, 1942, to February 4, 1949, it was exclusively broadcast on Mutual Broadcasting System network (MBS), one of the four main American commercial radio networks, in operation from 1934 to 1999. The program targeted children and young adults and was broadcast in the after-school afternoon slot as a 15-minute serial that aired three to five times per week, with separate story arcs reaching from 15 minutes to over three hours. During the 40s, the show has consistently featured amongst the most popular entertainment formats of youth radio programming (Hooper Inc., 1947, 1948, 1949). The series was discontinued in 1951, having aired 2088 original episodes.

The year 1946 represented a unique experiment in the history not only of the series, but of radio broadcasting in general. In October 1945 the producers of *The Adventures of Superman* started looking for writers who would contribute scripts that would pitch Superman on “*crusades against intolerance, state a case and a solution in terms which children could understand, keep the character of Superman alive and combine exciting entertainment with a plain spoken message*”.¹⁰ In April 1946, MBS broadly announced the beginning of “Operation Intolerance”, a series of new episodes that had the clear goal of disseminating the values of tolerance and unity regardless of race or religious backgrounds among young listeners. Amidst the resurgence of racial tensions following the conclusion of World War II, Superman assumed a significant role in advocating for the concept of a united American society that embraces individuals irrespective of their creeds or racial origins.

The first sequence of episodes under the umbrella of “Operation Intolerance”, “*The Hate Mongers’ Organisation*”, centered around the attempt of an exemplary white supremacist group,

¹⁰Cited from Lewis, W., Vice President of the responsible production company Kenyon & Eckhardt, (1946, May 13). “Reformers Challenged by Superman.” Broadcasting, pp. 75. Appendix Figure B5 provides the full statement.

the “Guardians of America”, to prevent the creation of a community center (Unity house) “where children of every race, ethnic background, and spiritual belief can play and interact to learn that all people are the same.”¹¹ With Superman’s assistance the hate mongers are defeated, allowing the establishment of Unity House to proceed. During the mid-1940s, when racial segregation enforced by the Jim Crow laws was still the prevailing practice in most states, it required little imagination to perceive the story arc as a deliberate political declaration, carefully designed to resonate with both the show’s young audience and adults alike.

Following the positive reception, the creators subsequently collaborated with Stetson Kennedy, a human rights activist who contributed to the infiltration of the KKK in the mid-1940s, to produce a story arc explicitly addressing the Klan and what it stood for. Over two weeks in June 1946, MBS broadcast a series of episodes of “*The Clan of the Fiery Cross*,” in which Superman directly battled the Klan. Using the information collected by Stetson Kennedy, the plot exposed the KKK’s rituals, code words, and bigotry to a national audience, trivializing their representation.

Another illustration of Superman addressing real-world issues related to racism and intolerance is depicted in the story titled “*George Latimer, Crooked Political Boss*.” In this narrative, the main antagonist, George Latimer, manipulates the governor of Metropolis to implement discriminatory practices during the hiring of veterans for state jobs. Latimer insists that only “native-born, white, Protestants” be considered (August–September 1946). The storyline’s resonance with the pertinent concerns surrounding the reintegration of veterans into civilian life was acknowledged and praised by the American Veterans Committee. This significant endorsement, despite the show’s primary target audience being juveniles, testifies to its reach beyond the realm of escapism, assuming a prominent role in reflecting and influencing contemporary culture.

Operation Intolerance was a huge success for the series. *The Adventures of Superman* became the highest-rated radio program for children. In an official statement, the former vice president of the United States, Henry A. Wallace, endorsed the plan “to use Superman for the purpose of teaching children that Democracy includes the idea of tolerance and equal opportunity for all races, creeds and colors.” Similar endorsements have been stated by various religious leaders, civil rights organizations and even president Truman.¹²

To provide quantitative evidence for the programming change, we perform a content anal-

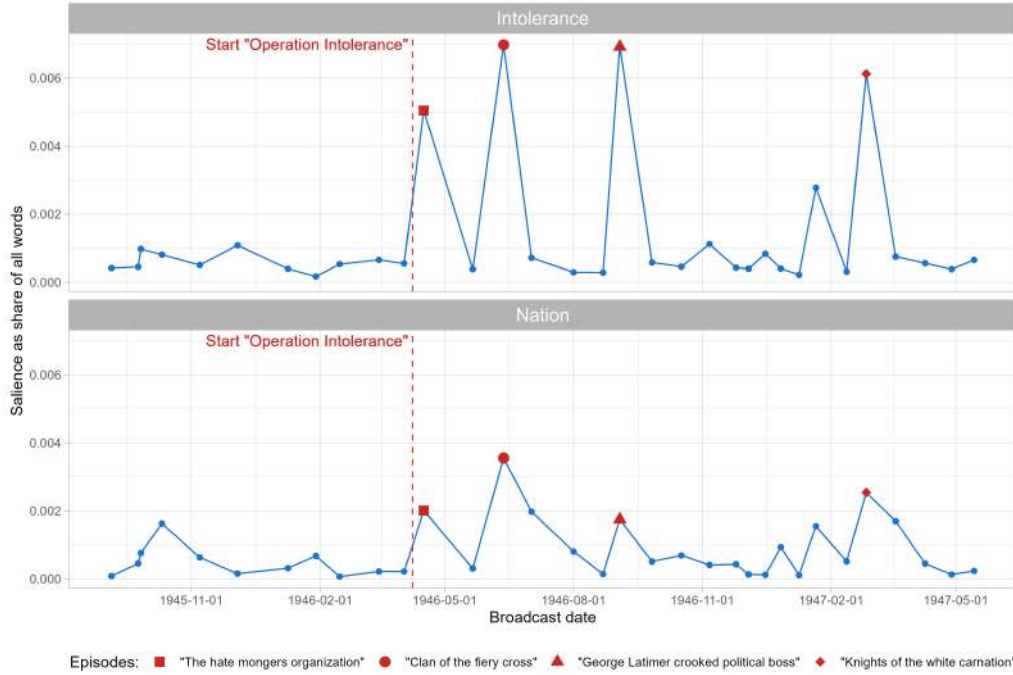
¹¹Cited from *The Adventures of Superman*, episodes 1254–1278, “The Hate Mongers’ Organisation”.

¹²Appendix B provides a detailed summary of the plot of key episodes and historical evidence from newspapers regarding the reception of the series by public opinion.

ysis based on the transcripts of episodes. We use a bag-of-words approach using tailored lists of keywords to compute two indicators, *Intolerance* and *Nation*, capturing changes in content of the episodes. *Intolerance* captures words that are related to tolerance for racial, ethnic and religious differences. *Nation* captures content related to a collective American identity and unity. Figure 1 presents the share of Intolerance related or, respectively, Nation related words per episode.¹³ Considering six months before and after the launch of “Operation Intolerance,” the share of words related to intolerance increased by 370.46% and by 222.14% for nation related content. This confirms a sudden and stark change in the type of content the show’s young listeners were exposed to. Further, the correlation pattern in Figure 1 across the two distinct indicators highlights that the concept of America as a nation has been closely linked to racial, ethnic and religious tolerance in the story arcs. Capitalizing on the enormous reach of the show, “Operation Intolerance” can therefore be seen as an attempt to redefine American values in the minds of a new generation of young Americans.

¹³We consider the period surrounding the programming policy change for which we could obtain the complete transcripts, from September 1945 to May 1948. Appendix Figure B4 provides an analysis based on a prolonged time series.

Figure 1: Prevalence of topics by episode of *The Adventures of Superman*



Note. Figures indicate the share of words in each episode that refer to intolerance (upper panel) or to nation (lower panel). We consider broadcast from September 1945 to May 1947. Data are derived from transcripts of the respective episodes. The keyword list for *Intolerance* contains bigotry, intolerance, tolerance, prejudice, discrimination, equality, race, hate, foreign, African, negro, ethnicity, jew, protestant, catholic, religion, creed, church, faith and variations of the aforementioned terms. The keyword list for *Nation* consists of America, un-American, American, nation, united, together, jointly, teamwork, collectively, community, United States and variations of the aforementioned terms. We remove stop words and apply basic stemming before calculating frequencies.

3 Data

3.1 Radio coverage

We digitize comprehensive data on the operating U.S. radio network in 1946 from the 1947 Broadcasting Yearbook. The Broadcasting Yearbooks serve as a comprehensive annual reference guide to the broadcasting industry in the U.S., providing detailed information about radio stations, broadcasting companies, and regulatory agencies. The publication includes listings of stations by state and city, along with information on station ownership, frequency, power, and programming. The entire digitized network consists of 986 individual antennas broadcasting radio programs on different frequencies and across different networks. Collected information include antenna location, network affiliation, transmitter power and frequencies. We also draw on detailed advertising records to identify when, and which radio stations broadcast *The Adventures of Superman*. Appendix Figure A2 provides the location of antennas.

To ensure accurate radio coverage calculations, it is important to note that in the 1940s the vast majority of radio broadcasting in the U.S. was based on amplitude modulation (AM) transmissions. AM stations have been very influential in U.S. starting from the 1920s ([Strömberg, 2004](#)). In 1940, they represented 99.6% of U.S. radio stations, and they still represent 74% of all stations at the beginning of the following decade ([US Bureau of the Census, 1975](#)). Although the FM network quickly expanded, actual listenership remained low: in 1960, 92% of all radio sets were AM only and it was only in 1979 that FM overtook AM in total listenership ([Kleinfeld, 1979](#)). Unlike frequency modulation (FM) transmission that depends on line-of-sight propagation (see, e.g., [Olken, 2009](#); [Yanagizawa-Drott, 2014](#); [Armand et al., 2020](#)), the propagation of the signal at lower frequencies, typically used for AM, is much less affected by the topography and other obstacles between the transmitter and the receiver. At lower frequencies, radio waves can pass through buildings, foliage and other obstructions and diffraction allows radio waves to bend over hills and other obstacles, traveling beyond the horizon following the contour of the Earth (see, e.g., [Reed and Sander, 1987](#)).

The propagation of AM transmission has two components: a ground wave that depends not only on topography, but also on the degree of soil conductivity, i.e., the ability of the soil to conduct electromagnetic waves, including moisture, soil composition, and mineral content; a sky wave that depends primarily on ionospheric refraction, i.e., the refraction or bending of radio waves by the degree of solar radiation in the ionosphere layer of the Earth’s atmosphere. As such, topography-corrected radio coverage models like the Longley-Rice/Irregular Terrain Model (ITM) are not accurate predictors of actual coverage ([Crabtree and Kern, 2018](#); [Gagliarducci et al., 2020](#)).

Using a state-of-the-art radio propagation model tailored to AM broadcasting in 1946, we estimate the precise radio coverage for each station, accounting for both ground and sky wave. The algorithm used to estimate signal strength considers a broad array of input values, including frequency, power, antenna type, topography, soil conductivity and sun spot numbers.¹⁴ The predictions produced a raster covering the continental U.S. at a resolution of 400 meters.

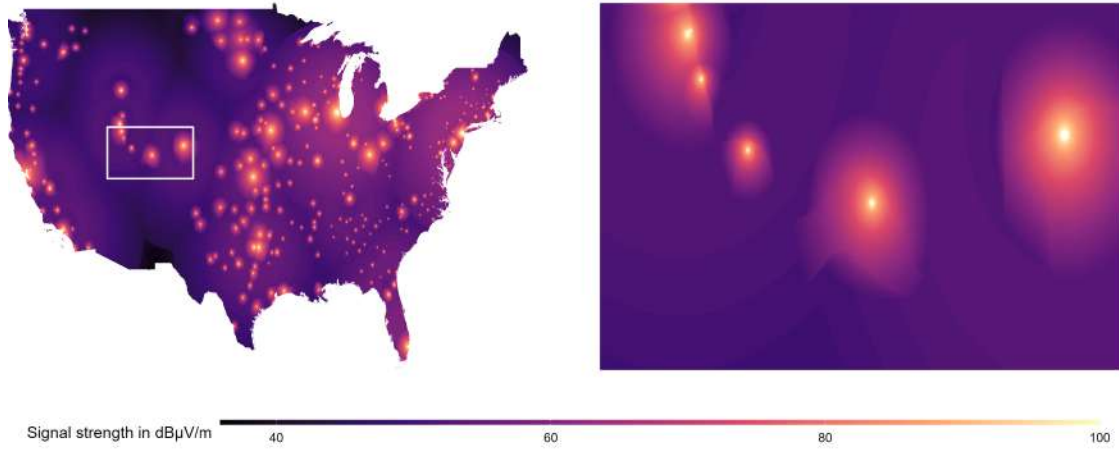
We overlay the signal strength of all stations affiliated with MBS. As many cells are covered by multiple stations, we assume listeners would tune into the station with the strongest signal and we keep that signal strength measure for those cells. This produces a single raster layer for

¹⁴While some open source tools for prediction are available, we collaborated with [ATDI](#), a global leader in radio engineering, to ensure accuracy over the thousands of antennas broadcasting in our time period of interest.

the whole MBS network. The Left hand side of Panel A in Figure 3 shows the geographical distribution of the signal strength of the MBS network. The right figure in Panel A zooms into a specific portion of the U.S. indicated by the square in the left panel.

It is worth noting that accurate estimation of AM propagation, specifically for the ground wave dominant during daytime, became feasible only in 1958 (Bremmer, 1958a,b), which is more than a decade after our program of interest was broadcast. Prior to that, radio operators had an incomplete understanding of potential signal coverage when setting up their antennas. While radio coverage is heavily influenced by the placement of antennas, as seen with FM transmission, actual coverage follows a plausibly-random pattern conditional on local characteristics.

Figure 2: Signal strength of *The Adventures of Superman*



Note. The Left hand side shows the geographical distribution of the signal strength of the *Superman* broadcast at a resolution of $400m^2$. The right panel zooms into a specific portion of the U.S. indicated by the square in the left panel. Details about the geo-location of antennas and the computation of the signal strength are provided in Section 3.3.

To derive meaningful county-level measures of radio exposure, we convert continuous values into binary coverage indicators at the cell level using the threshold of $66dB\mu V/m$ field strength, broadly considered as required sensitivity limit for AM broadcasting (ETSI, 2021). Based on the binary map of coverage at the cell level, we calculate the share of each county area covered with sufficiently strong signal.¹⁵ Panel B in Figure 3 shows the geographical variation of the resulting outcome.

¹⁵Results are robust to using population-adjusted coverage using the population distribution in 1940.

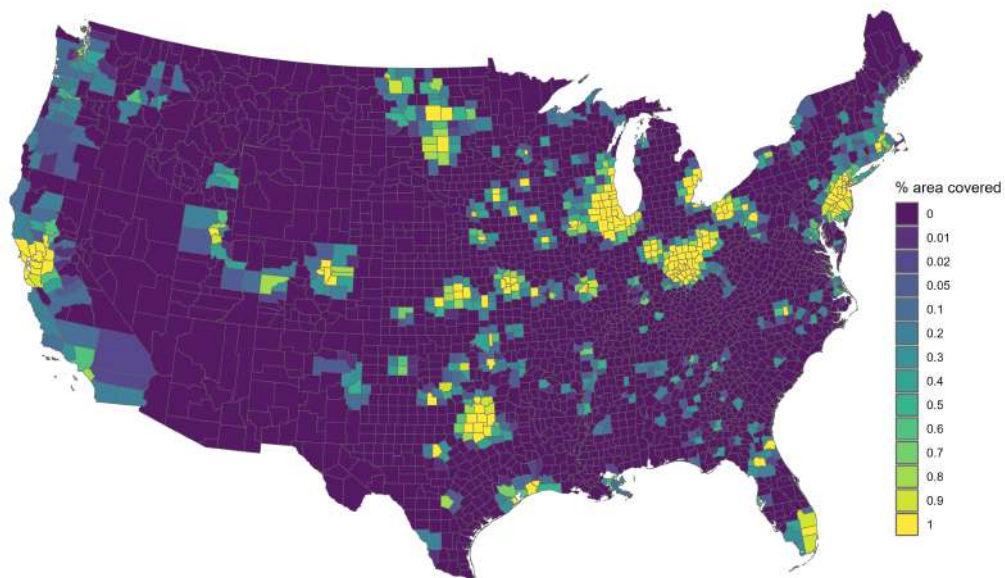
Maximum conductivity coverage with AM radio Our main specification (explained in Section 4) will exploit a sudden shift in the programming of the radio series as a natural experiment. This strategy has been applied in the context of AM radio broadcasting by Adena et al. (2015), for example. For additional robustness, we will implement a secondary strategy exploiting arguably random variation in geographic conditions, inspired by the approach pioneered by Olken (2009) in the context of Television and Frequency modulation (FM) broadcasting. FM transmission depends on line-of-sight propagation, and hence, topographic obstacles generate arguably random variation in terms of signal exposure, which can be exploited for estimation (see, e.g., Olken, 2009; Yanagizawa-Drott, 2014; Armand et al., 2020). By controlling for “free field coverage,” that is, theoretical coverage in absence of any obstacles, these studies exploit random residual exposure as the difference of actual exposure and free field exposure for identification.

As previously described in this Section, AM propagation during daytime works mainly through the surface wave, which is able to surpass these topographic obstacles. The main determinant for its signal loss over distance, conditional on frequency, power and antenna specifications, is the degree of soil conductivity between antenna and receiver. Soil conductivity on the propagation path is arguably random (Strömberg, 2004). In the spirit of the measure of “free field coverage”, we calculate “maximum conductivity coverage” for AM radio broadcasting.¹⁶ We do so by assuming the maximum value of soil conductivity found in the US, of 30 mS/m homogeneously for the entire country (see Figure A3 for a detailed map of different conductivity zones). Resulting from this exercise, we generate theoretical signal strength for each antenna, i.e simulated signal strength in the absence of any low conductivity areas limiting the propagation of the radio wave. This measure is then merely a function of distance between antenna and receiver and antenna characteristics. Thus by controlling for “maximum conductivity coverage”, we capture the possibly endogenous choices on the supply side of the network operators. Panel A of Figure 3 shows coverage based on the actual signal strength of the Superman radio program. Panel B shows coverage based on the hypothetical signal strength, assuming homogeneous, maximum soil conductivity.

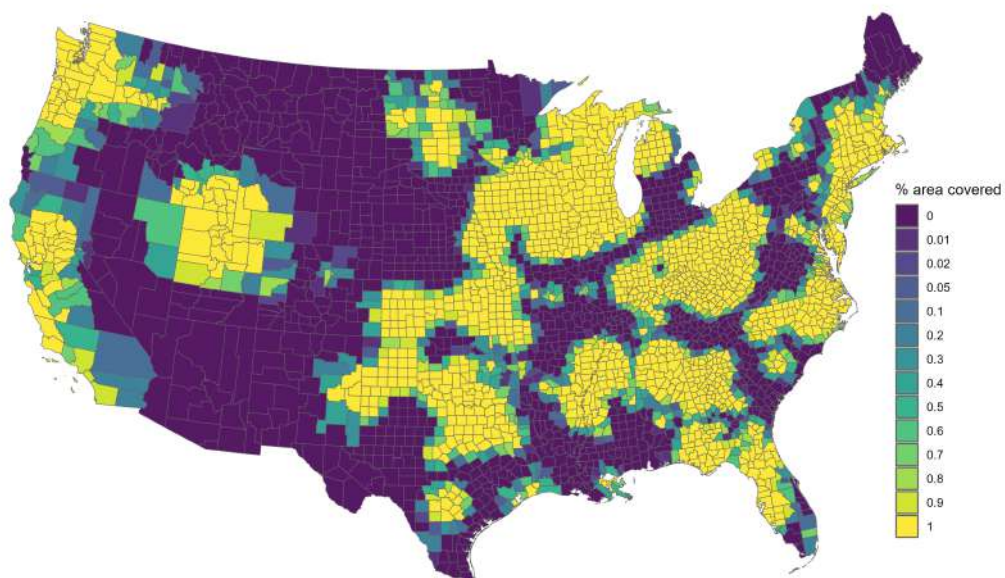
¹⁶We calculate “Maximum conductivity” coverage based on ITU-R P.368-7 recommendations, using the software “Field Strength Calculator One”. We verified the validity of the software by cross-checking prediction results with our commissioned estimates generated by ATDI, one of the market leading radio engineering companies.

Figure 3: Radio coverage of *The adventures of Superman* in 1946

A. True county-level coverage



B. “Maximum conductivity” county-level coverage



Note. This figure shows the share of counties’ area covered by the Superman radio program in 1946. We consider a cell as covered if it has at least medium signal strength ($\geq 66dB\mu V/m$). Panel A shows the geographical distribution of the actual signal strength. Panel B shows the signal strength, assuming homogeneous, maximum ground conductivity across the US of 30 mS/m .

3.2 Public discourse in local newspapers

While television and social media were not present or impactful at this time, newspapers played a crucial role in disseminating information, facilitating public discourse, and influencing opinions. We collect data from 1649 local newspapers from the online archive *newspapers.com* with headquarters in 1371 counties across 48 states. The archive contains more than 8.3 million pages for the period of January 1945 to December 1947. Figure F21 visualizes the distribution of newspapers across the US. We perform text analysis with a bag-of words approach, treating the corpus as an unstructured matrix of words and exploring the unconditional frequency of words' appearance. This is a standard approach in the growing literature on the use of historical newspapers as a source of data (Beach and Hanlon, 2022).

We focus on two themes. The first refers to the presence in the newspapers of articles covering the show *The Adventures of Superman*. For this purpose, we collect the number of pages per newspaper and month containing any reference to Superman. The second refers to intolerance. For this purpose, we collect the number of pages per newspaper and month containing any reference to the KKK (or related words such as Klavern or Klansman). For both, we define salience of theme k in month t and county c as the share of pages containing a specific combination of keywords:

$$(1) \quad \text{Salience}_{k,c}^t = \frac{\text{pages}_{k,c}^t}{\text{all_pages}_c^t}$$

where $\text{pages}_{k,c}^t$ is the number of pages mentioning at least one of the keywords at time t , and all_pages_c^t is the total number of pages in newspapers of county c in the same period. This approach is in line with Esposito et al. (2023).

3.3 Social mobilization

We gather data about social mobilization and collective action by focusing on outcomes that could have affected adults at the time or after the broadcast, including voting for segregationist politicians, actual segregation in accommodation and services, and the presence of hate-based and civil rights organizations.

Segregationist voting. We gather electoral outcomes by county for state-level elections

from 1926 to 1964 in the Deep South, where elections often centered around topics related to racial segregation. The data, obtained from [Heard and Strong \(2006\)](#) and [Bartley and Graham \(2006\)](#), include county-level vote shares for various types of elections, including Attorney General, Governor, Lieutenant Governor, National Committeeman, National Convention, President, and Senators.

Classifying politicians according to their stance on segregation and civil rights poses a significant challenge and detailed data on historical political platforms by candidate and election is not readily available. To address this issue, we collect data on the outcomes of public referendums related to segregation and civil rights at the county level. These referendums typically involved constitutional amendments and were divided into two categories: those related to school desegregation and those related to voter disenfranchisement laws. By using public votes as a proxy for revealed preferences regarding civil rights at the county level, we identify the counties that were the most progressive or segregationist leaning in each state. In a second step, we classify politicians who performed relatively well in these progressive or segregationist-leaning counties, i.e., those who won a higher vote share in these counties compared to their state-level average, as either progressive or segregationist, respectively.

Racial segregation. We gather data about actual segregation in accommodation and services for African Americans using the *Negro Motorist Green Books* (or Green Books), a series of travel guides published during the Jim Crow era providing lists of non-discriminatory services to African Americans. These include formal and informal accommodation, gas stations, restaurants and bars, barber shops and beauty parlors, and other types of services, such as pharmacies and facilities for entertainment and recreation. We use the number of establishments in a county using the data provided by [Cook et al. \(2023\)](#), which include county-level panel data based on the geo-locations of over 4,000 businesses between 1939 and 1955.

Hate-based versus civil rights organizations. We focus on two types of organizations capturing social mobilization towards hate and intolerance, and social mobilization in favor of civil rights. First, we focus on the presence of the KKK. We collect county-level presence of KKK using three separate sources. First, [Kneebone and Torres \(2015\)](#) provides a list of KKK chapters active during the Second KKK (1919–1942), including the date in which the chapter first appeared. Second, we digitized the list of chapters provided by the [Committee on Un-American Activities \(1967\)](#), which includes a survey of KKK activity in 1965. This source is also used in [Mazumder](#)

(2018). Third, we obtain the location of KKK chapters in the period 2000–2020 from the [Southern Poverty Law Center \(2023\)](#), which provides an annual census of hate groups operating in the U.S.

Second, we focus on the presence of the National Association for the Advancement of Colored People (NAACP). It is the most prominent civil rights organization in the US, promoting the rights of African Americans and other marginalized communities. It provides advocacy, litigation, and grassroots mobilization to address the four main issues related to civil rights: racial discrimination, voter suppression, criminal justice, and equality of access to education. Founded in 1909, the organization experienced significant growth in the early 20th century, reaching nearly 400 chapters in 1920, followed by a decline in the 1920s and a gradual rebuilding in the 1930s. Membership surged again during the civil rights movement, surpassing 1,000 branch organizations. The organisation further continued to grow throughout the 1960s and remains active.

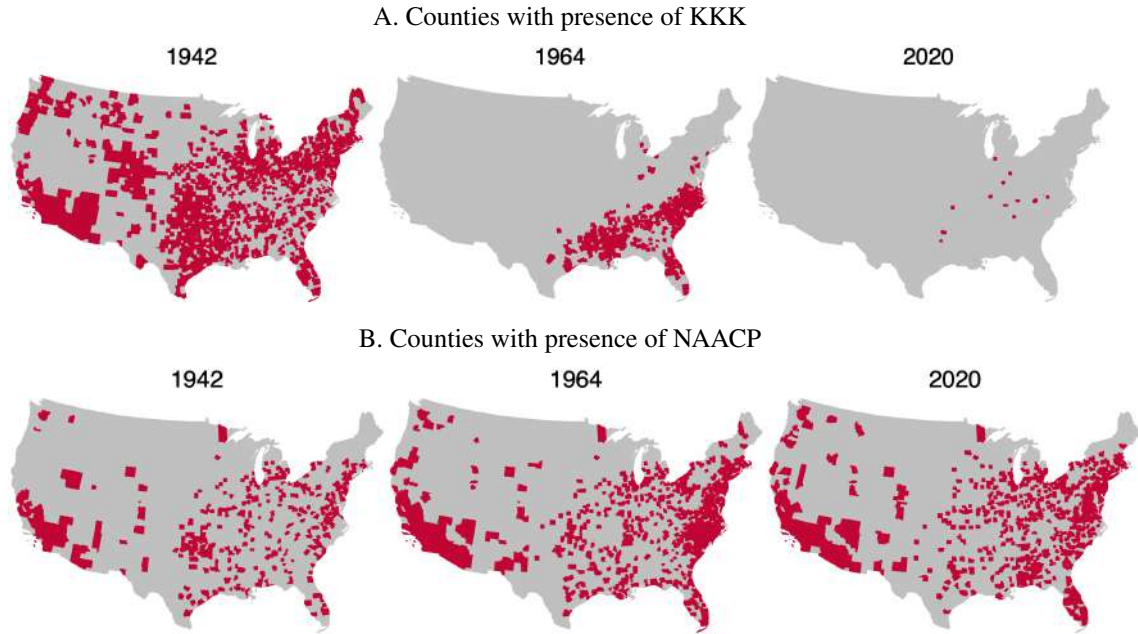
We compute county-level presence of NAACP using two separate sources. First, we obtain the location of NAACP chapters for the period 1912–1977 from the project *Mapping American Social Movements Through the 20th Century* at the University of Washington, which provides the location of chapters in this period built using historical reports from the NAACP. Second, we digitized the presence of NAACP in 2011 and the present using a comprehensive list of branches for adults in 2011 and web-scraping.¹⁷ Figure E16 shows the geographical distribution of counties in which the KKK and NAACP chapters are present over three distinct years. Appendix G provides descriptive statistics about the share of counties in which each group is found from the 1920s to nowadays. The KKK was present in 36.5% of counties throughout the U.S. in 1942, a share that decreased to 11.7% in 1964, and had almost disappeared in 2020 with only 25 active branches. In contrast, the NAACP was present in 12.3% of counties in 1942, in 22.4% in 1964, and in 22% in 2020.

3.4 Attitudes and behavior in the target population

We gather data about attitudes and behavior for the population directly targeted by the broadcast, that is, children and young adults.

¹⁷Web-scraping is performed in May 2023, we assign the year 2020 to this source as we match with branch identifiers used in NAACP accounting data for 2020. Currently, the NAACP is open at multiple levels through state conferences, branches for adults, branches for youth, branches for prisoners, and branches in universities. We collected addresses of currently-active branches of NAACP by scraping all active NAACP websites, Google Maps locations, and the list of registered charities and non-profit organizations in the U.S. Internal Revenue Services database. We geo-located each active branch using the city reported in the address.

Figure 4: Geographical distribution of hate-based and civil group organizations



Note. Panel A indicates the presence of KKK chapters in 1942, 1964 and 2020. Panel B indicates the presence of NAACP chapters in 1942, 1964, and 2023. Counties are highlighted if at least one chapter is active. A detailed description of data sources is provided in Section 3.3.

Attitudes. We gather data about attitudes and behavior for the population directly targeted by the broadcast, i.e., children and young adults. For attitudes, we collect information from the *American National Election Studies (ANES)*. ANES is a nationally-representative survey of voters conducted every two years during and after each U.S. presidential election. It collects information about public opinion, voter behavior, and political attitudes. We use data collected in the period 1964–1978. We merge responses in the ANES surveys with exposure to the radio program using the date of birth of the respondent and the county of the respondent.

We primarily focus on two types of attitudes. First, we examine racist political attitudes. We measure this dimension using answers to whether the respondents are in favor of desegregation or support strict segregation. Second, we also analyze their self-reported feelings towards African Americans. Appendix Figure C8 presents a breakdown of support for strict segregation by survey wave and age cohort. Support for segregationist policies consistently decreases with respondents' age and over time. While 17% of the 20–29 age group still support segregation in 1964, this number drops to 3% by 1978. For the oldest age group – 70 years and older – support decreases from 33% to 10% in the respective years.

Interracial marriage. To study impacts on manifested changes in racial attitudes, we col-

lect data on interracial marriage rates as a natural behavioral outcome. An interracial marriage can be seen as the “the final stage of assimilation” (Gordon, 1964). We exploit data from US IPUMS, specifically leveraging 5% of the sample from the 1980 US Census. The 1980 census sample contains 11,274,348 observations from continental US. We take into account the 4,699,099 married individuals. The aggregate share of interracial marriage is equal to 1.65%. 58.79% of these are marriages between White and Black individuals, who together account for 97.83% of the total population sample.

As the 1980 census does not disclose counties below 100000 inhabitants, we recalculate our treatment measure at the level of the 1148 Principal Statistical Units (PSU) which can consistently be obtained for the full sample. We limit our analysis to married individuals. We then calculate the share of individuals in interracial marriages by year of marriage and PSU. We consider either all interracial marriages or only black-white marriages. Thus we obtain two panel data sets of year of race-specific marriage rates at the level of the 1148 PSUs.

Vietnam war participation. To further examine effects on behavior, we shift our focus to the participation in one of the most important events for the generation born in the 1940s – the Vietnam War. Because individual level information on origin and deployment is not publicly available, we use casualties as a proxy for participation. This approach assumes that among those mobilized, being wounded or dying (versus not) was largely random. This aligns with Esposito et al. (2023), who uses casualties during World War I. Importantly, participation in the Vietnam War is primarily characterized by volunteers. Only 25% of those who served in Vietnam were draftees, compared to 66% during WWII. Notably 70% of casualties were volunteers (Davidson, 1988).¹⁸

To compute casualties, we obtain data about the date and the hometown of each individual from the *Defense Casualty Analysis System (DCAS)* database. The database is compiled by the U.S. Department of Defense and provides records documenting the deaths of U.S. military officers and soldiers resulting from hostile or non-hostile occurrences in the Korean War, Vietnam War, Gulf War, the War on Terrorism, and (beginning in 1975) casualties classified as occurring during

¹⁸Eligible men aged 17 or older had the option to volunteer, provided they had parental consent if they were under the age of 18. Alternatively, when men reached the age of 18, they were obligated to report to their local draft board. Depending on their classification as ‘available for service’ and their successful completion of a pre-induction test, they could be ordered to report for duty. Those classified as available for service had the choice to volunteer, allowing them to select the service branch and serving for a shorter period. Draftees were typically assigned to the Army and served for up to three years (Card and Lemieux, 2001).

peacetime, and they include deaths caused by accidents or illnesses. These records contain many details such as the service member’s name, rank, gender, date of birth, hometown, marital status, religion, race, casualty circumstances, unit, duty, date of death, and information regarding the conflict and incident in which the casualty occurred.¹⁹

In total, we observe 57,241 casualties during the conflict in Vietnam, 86.5% represented by white soldiers, and 12.6% by African American soldiers. Because the probability of death during each conflict is cohort-specific (see Appendix D), we compute as the main outcome variable the cohort-specific share of deaths from each county. This is defined as:

$$(2) \quad Y_{hc} = \frac{\text{casualties}_{hc}}{\text{casualties}_h}$$

where casualties_{hc} is the number of casualties in cohort h (defined in time-spans from the start of the broadcast) in county c and casualties_h is the total number of casualties in cohort h . Further descriptive statistics about this data source are provided in Appendix D.

4 Empirical approach

The aim of the paper is to identify the causal effects of the episodes of *The Adventures of Superman* broadcast in 1946 on a variety of outcomes. We measure exposure to the program as the share of each county covered by the signal of the MBS radio network in 1946, labelled as R_c^{1946} . For the analysis, we use the county-level administrative division of the U.S. in 1946. In line with the previous literature on the effect of mass media (see, e.g., Olken, 2009), this measure is similar to an *intention-to-treat* exposure because it captures the probability of listening to the radio program, rather than the actual exposure (which is unobservable in this context).

To identify the causal effect of the radio show, we face two main challenges. First, as discussed in Section 3.1, when radio broadcasts are characterized by AM transmissions, we cannot rely uniquely on local topographic variation as a random determinant of signal reception – a widely used approach in the literature for FM and TV broadcasting (Enikolopov et al., 2011; Yanagizawa-Drott, 2014; Olken, 2009; Adena et al., 2015; DellaVigna et al., 2014; Armand et al., 2020). We suggest an alternative approach, exploiting differences in ground conductivity for additional

¹⁹Concerning the location of birth, the dataset provides the *home of record* address, i.e., the place recorded as the home of the individual when commissioned, appointed, enlisted, inducted or ordered on active duty.

robustness checks. Second, while most of the literature focuses on the effect of radio broadcast, we are aiming at estimating the effect of a change in the content of an existing radio program.

To address these challenges, we compare multiple cohorts or multiple time periods. Identification relies on two important assumptions. First, focusing on multiple cohorts or multiple time periods, we assume that, conditional on local administrative unit fixed effects, the variation in radio coverage derived from the model described in Section 3.1 is quasi-random with respect to the temporal evolution of idiosyncratic (unobservable) determinants of the outcomes studied in this research. This means that areas covered by the MBS network and areas not covered by the MBS network in 1946 behave similarly over time. Second, the radio network of MBS in 1946 is very specific to that year. Radio networks in the U.S. expanded and changed significantly in the 1940s, and MBS represents only one of the networks active in the country. The number of AM stations increased 2.5 times in the 1940s, from 847 in 1940 to 2,144 in 1950 (US Bureau of the Census, 1975). In addition, the 1950s witnessed the beginning of the expansion of TV, which substantially reduced the centrality of radio as a mass medium over time (Gentzkow, 2006). In 1950, penetration of TV in the U.S. was 9%, by 1959, it had reached 86% (Allen and Thompson, 2023).

We rely on two complementary approaches to capture the causal effect. The first, which uses county-level (panel data), captures both the effect of *The Adventures of Superman* and the more general content broadcast by MBS in 1946. The second aims instead at disentangling the role of *The Adventures of Superman* from the general radio coverage in 1946 using individual- or cohort-level observations.

The first approach relies on panel data at the county level using a (dynamic) difference-in-differences (DiD) specification. This approach compares counties within the same state and year, covered by the signal of MBS in 1946 with counties not covered in relative time as compared to 1946. We estimate the following specification:

$$(3) \quad Y_{c,t} = \sum_{\tau=-a}^a \gamma_{\tau} T_{\tau} \cdot R_c^{1946} + \mu_c + \mu_{s,t} + \epsilon_{c,t}$$

where $Y_{c,t}$ is the outcome variable for county c at time t , T_{τ} is an indicator variable if the observation refers to time $t = \tau$, and μ_c , $\mu_{s,t}$ are county and state-year fixed effects, respectively. The error term $\epsilon_{c,t}$ is assumed to be clustered at the county level. Note that all the units treated by

the radio signal are treated at the same time, which makes our specification immune to problems associated with heterogeneity in the dynamic treatment effects in staggered designs (Roth et al., 2023).

The second approach is a cohort-study specification. This approach compares, at different ages in 1946, children (or cohorts) living in areas covered by the radio signal with children (or cohorts) living in areas not covered. The assumption behind this specification is that children in the age group targeted by the program could have listened to the Superman episodes, while individuals too old or too young or not born, would have not been exposed directly to the episodes. In this approach, we estimate the following specification:

$$(4) \quad Y_{ihc,t} = \sum_{\tau=-a}^a \gamma_{\tau} D_{\tau} \cdot R_c^{1946} + X'_{ihc,t} \lambda + \mu_h + \mu_c + \mu_{s,t} + \epsilon_{ihc,t}$$

where $Y_{ihc,t}$ is the outcome variable for individual i of cohort h (relative to 1946) born in county c and interviewed at time t , and D_{τ} is an indicator variable if individual i is from cohort $h = \tau$. $X'_{ihc,t}$ is a set of individual- or cohort-specific characteristics. μ_h , μ_c , $\mu_{s,t}$ are cohort, county, and state-time fixed effects, respectively. When the number of observations within each county is too small, we replace μ_c with state fixed effects. In addition, when data at the individual level are unavailable, for instance, in the case of variable measuring participation in the Vietnam war, we use a county-level outcome variable ($Y_{hc,t}$). The error term $\epsilon_{ihc,t}$ is assumed to be clustered at the individual or cohort level.

Finally, we will also show robustness of our results controlling for “Maximum conductivity coverage,” which will control for potentially endogenous radio coverage originating from the supply side (see Section 3.1 and Section E in the Appendix for more details).

5 Results

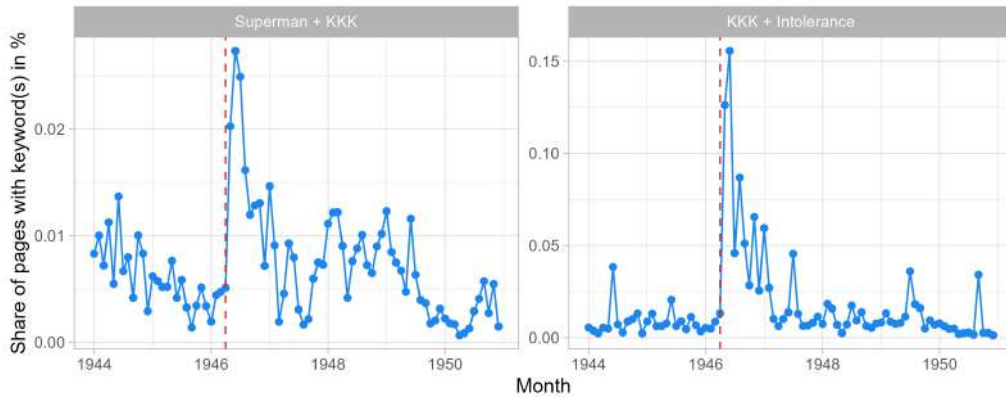
5.1 Radio broadcasting and public discourse

As documented in Section 2.2, the year 1946 witnessed a sudden and radical change in radio programming targeted at children and young adults, implemented by one of the largest contemporary broadcasting networks. Qualitative evidence reveals that the impact of this new broadcasting pol-

icy extended far beyond its target audience. Notably, the producers of the show garnered attention from various quarters, including President Truman, underscoring the wide-ranging implications and the potential of the program to put certain topics prominently on the media agenda and, therefore, directly influencing the public discourse.

Figure 5 presents a first piece of descriptive evidence on the association between “Operation Intolerance” and media attention measured as aggregate topic salience in newspapers. Both, the aggregate salience of articles referring to Superman’s crusade against the Klan, as well as those negatively reporting about the Klan in general, suddenly and sharply increase with the start of the radio campaign. Further, the left panel shows that newspapers were still reporting on Superman’s fight against the KKK three years after the initial announcement, until the show left the MBS network in July 1949. This suggests that the echo in alternative media outlets had significant potential to magnify the impact of the radio show.

Figure 5: Salience of articles about “Operation Intolerance” and the KKK in local newspapers



Note. Figures indicate the share of pages in local newspapers containing the combination of keywords “Superman” and “KKK” (left panel) or “KKK” and “Intolerance”, and respective variations, in a specific month. The dotted line marks the beginning of “Operation Intolerance”. We consider newspaper articles from January 1944 to December 1950.

Next we provide quantitative evidence for this point by comparing the effect of the broadcast on public discourse in local newspapers in counties exposed to the show to those which were not. Section F.3 in the appendix lays out that newspapers in exposed counties were consistently more than twice as likely to refer to the show in any given month. Hence, we can exploit this local dimension to further investigate whether the shift in radio programming induced changes in the content of exposed local newspapers.

Figure 6 shows the event study estimates of the effect on the salience on newspapers of the program (Panel A) and of intolerance (Panel B) using equation (3) with monthly observations

at the county level. This approach compares the salience of topics in local newspapers across areas covered and not covered by the signal in 1946, before and after the launch of Operation Intolerance. We find that prior to the launch of the revised story arc targeting intolerance, topics associated with superman or intolerance were no more salient in areas covered by the radio signal in 1946 than areas not covered. This changes after April 1946, when the first episode of Operation Intolerance was launched. While Superman becomes slightly more salient post the relevant episodes, topics related to intolerance experience a large increase in salience that lasts until February 1946. Local newspapers, headquartered in areas covered by the program, show a relative increase in the number of pages containing articles related to the KKK. Salience of KKK related articles remains higher in the areas exposed to the show until 1950.

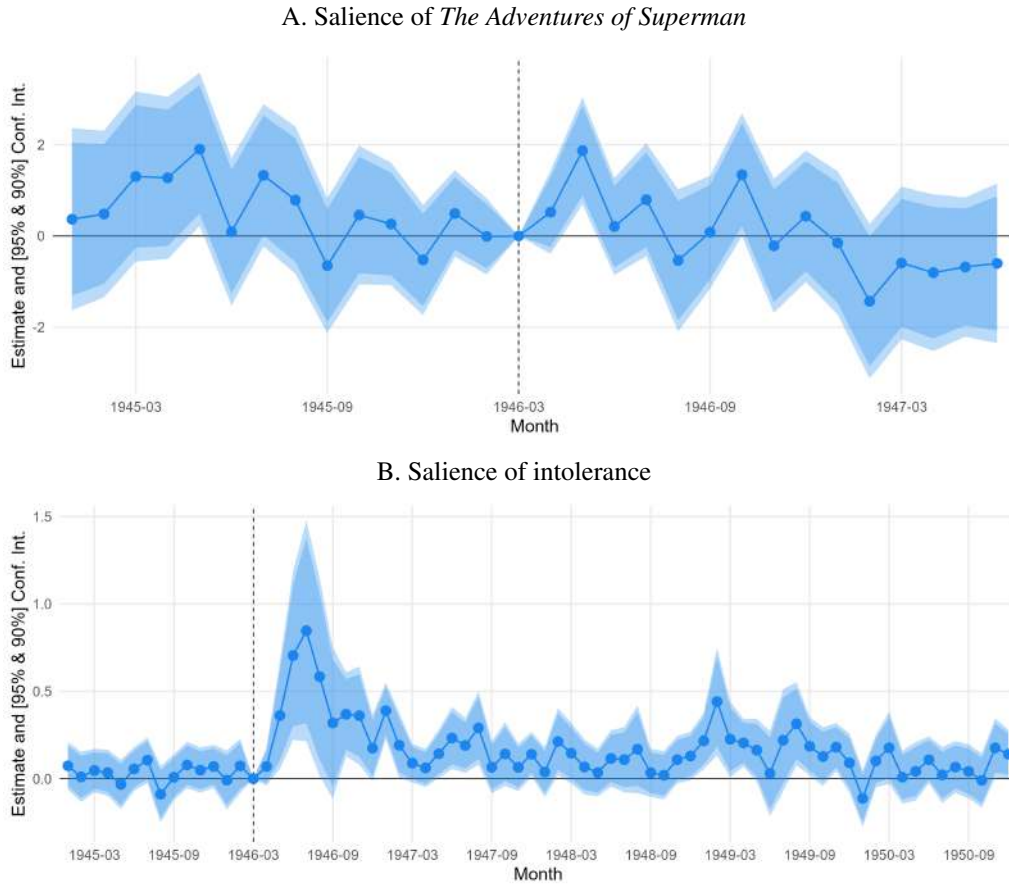
At the peak we estimate an increase in the share of related pages of 0.71 in June 1946 and 0.85 in July 1946, the two months in which the most controversial Episodes of the story arch “*Klan of the Fiery Cross*” aired. Taken at face value, our estimates imply 1.15 additional articles per month and county in year one, 0.49 additional articles in year two, 0.52 additional articles in year three and 0.43 additional articles in year four after the launch of “Operation Intolerance”. While radio broadcasting was dominated by a limited number of national networks, local newspapers served as a primary source of news with a stronger focus on local issues. Our results indicate that the program not only influenced the listeners directly through a change in its content but also influenced public opinion more generally throughout 1946 and 1947. In line with the framework of agenda setting (e.g., [McCombs et al., 2014](#)), the series potentially had a significant impact on the conversations within the heart of American society, way beyond its initial target audience.²⁰

5.2 Social mobilization and collective action

In this section, we focus on three dimensions of social mobilization and collective action. First, in Section 5.2.1, we examine the effects on voting behavior, specifically focusing on support for segregationist or desegregationist leaders. Second, in Section 5.2.2, we discuss the effects on racial segregation in the provision of services and two important forms of grassroots mobilization, the formation of hate-based and of civil rights groups.

²⁰Section E.1 in the Appendix shows that general conclusions hold when controlling for “maximum conductivity” coverage addressing concerns of the potentially endogenous placement of radio antennas.

Figure 6: Effect on public discourse in local newspapers



Note. Estimates based on equation (3) using county, month and state-year fixed effects. In Panel A, the dependent variable is the share of pages containing at least one reference to Superman. In Panel B, the dependent variable is the share of pages containing at least one reference to KKK and related words. Details about the measurement are provided in Section 3.2. The vertical line indicates the beginning of Operation Intolerance with the broadcast of the episodes of *The Hate Mongers Organisation*.

5.2.1 Segregationist voting in the Deep South

This Section focuses on collective action related to the Civil Rights Movement in the form of voting for pro- or anti-segregation leaders in the Southern states of the country, where segregation was enforced by law in the 1940s. The disagreement on segregation fractionalized the Democratic party. The passage of the Civil Rights Act of 1964 led ultimately to the end of the one party rule of the Democrats in the South (Bartley and Graham, 2019).

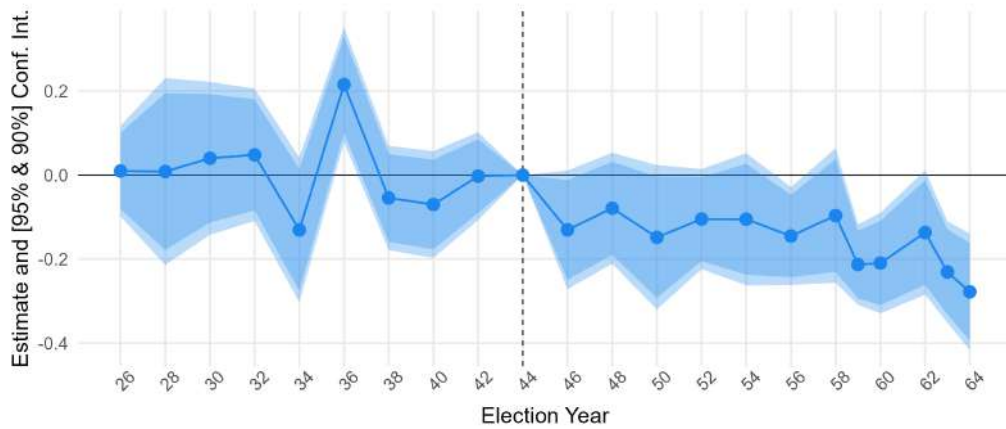
Figure 7 shows estimates of the effect of the broadcast on the voting share of segregationist candidates by pooling four Southern states: Georgia, Louisiana, South Carolina and Alabama.²¹

²¹While Mississippi is traditionally considered as part of the Deep South, data constraints force us to drop it from the analysis.

Candidates are classified based on the methodology laid out in Section 3.3. We use the full set of county-level election outcomes, including the elections for the Senate, Governors, Lieutenant Governor, National Committeeman and the Presidential elections. We estimate effects using equation (3) and include state-by-year fixed effects to purge time-varying state-level and election specific unobservable characteristics.

Our results coherently indicate a drop in the vote share of pro-segregation candidates. We do not observe any systematic differences between counties covered by the broadcast in 1946 and counties not covered before the programming shift. Estimates coefficients reach from -1.33 percentage points in 1946 to -2.8 percentage points in 1964. We interpret these direct effects in the light of agenda setting in the broader media landscape, extending the impact of the broadcast far beyond its initial target group (see Section 5.1). In later elections the directly targeted group of young adults came increasingly into voting age, potentially further decreasing the electoral success of segregationist candidates.²²

Figure 7: The effect on segregationist voting in the Deep South



Note. Estimates based on equation (3) including state-by-year fixed effects. The dependent variable is the vote share of the segregationist candidate across all elections. Segregationist candidates are classified using the data-driven approach described in Section 3.3. The shaded areas indicate the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance.

5.2.2 Racial segregation and the proliferation of hate-based versus civil rights groups

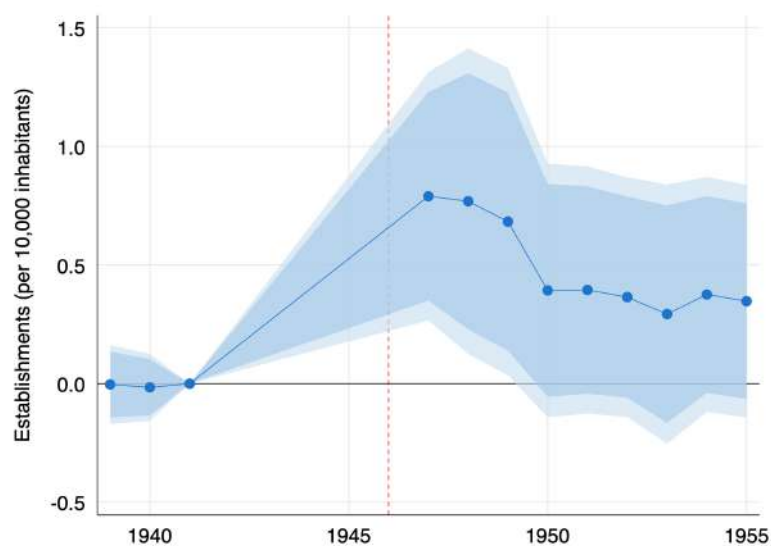
Figure 8 shows estimates of the effect of the broadcast on racial segregation. We consider the total number of establishments in the Green Books including all types of establishments, includ-

²²Section E.2.1 in the Appendix shows that general conclusions hold when controlling for “maximum conductivity” coverage addressing concerns of the potentially endogenous placement of radio antennas.

ing formal and informal accommodation, restaurants and bars, barber shops and beauty parlors, gas stations, and other types of services, such as pharmacies and facilities for entertainment and recreation. Estimates are based on equation (3) using all available data points in the dataset (1939–1941 in the pre-broadcast period, and 1947–1955 in the post-broadcast period). The number of establishments is normalized by the population in the county using a factor of 10,000 inhabitants. Population is based on the 1940 and 1950 U.S. censuses.

We observe a significant increase of 0.79 establishments per 10,000 inhabitant in 1947. This effect reduces over time, become statistically insignificant in 1950 and reaches a magnitude of 0.35 in 1955. The magnitude of this effect is large: in the period 1947–1949, the number of establishments in areas covered by the broadcasts increases by 68 to 77% as compared to the average number of establishments in the corresponding period in areas not covered (1.03 establishments per 10,000 inhabitants).

Figure 8: The effect on racial segregation in the provision of services



Note. Estimates based on equation (3) including county and state by year fixed effects. The dependent variable is the county-level total number of establishments with non-discriminatory services to African Americans as included in the Green Books. Data are described in [Cook et al. \(2023\)](#). The number of establishments is normalized by 10,000 inhabitants. We consider all types of services: formal and informal accommodation, restaurants and bars, barber shops and beauty parlors, gas stations, and other types of services, such as pharmacies and facilities for entertainment and recreation. The shaded areas indicates the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance. Refer to Section 3.3 for further details about data.

In Appendix Figure G27, we further distinguish between two categories of establishments by the degree of segregation they represent. The first is segregation in accommodation, which represented the more extreme form of segregation. Restrictions in this sector implied that African

American travelers often had to rely on inferior lodging establishments designated for African Americans. The other category of services represent a (relatively) less extreme form of segregation. Appendix Figure G27 shows estimates of the effect of the broadcast on the number of establishments separately for each category. The effect on racial segregation is primarily driven by increases in the number of restaurants and bars, barber shops, and other establishments. For all these services, the effect remains significant for most of the 1947–1955 period. In contrast, we do not observe any significant effect in the number of establishments offering accommodation, and we observe only a short run effect. These results highlight that the broadcast was very effective at reducing racial segregation, but primarily in services unrelated to accommodation.

Next we examine effects on the proliferation of hate-based and civil rights groups. While we focus on the the presence of civil rights groups, for the ease of comparison, we focus on the absence of hate-based groups. Figure E16 shows estimates of the effect of the broadcast on the share of counties in which hate-based groups, proxied by KKK chapters, are absent (Panel A), and on the share of counties in which civil rights groups, proxied by NAACP chapters, are present (Panel B). Estimates are based on equation (3), thus comparing over time counties covered and not covered by the broadcast in 1946. Because data are built from alternative data sources (see Section 3.3), we consider different data points depending on data availability and variation within the time span. For KKK, we consider presence in the pre-broadcast period, during the spread, and at the end of second KKK (1926, 1928, 1930, and 1942), and for available data points during the post-broadcast (1964, 2000, 2004, 2008, 2012, 2016, 2020). For the analysis we focus on the presence of KKK in Southern states as after WWII the KKK was present primarily in these states (Figure E16). For NAACP, we consider presence in the pre-WWII period considering 5-year intervals (1925, 1930, 1935, 1940), in the last measurement before the launch of Operation Intolerance (1942, used as reference year), and for available data points in the post-Operation Intolerance period (1958, 1964, 2011 and 2020).

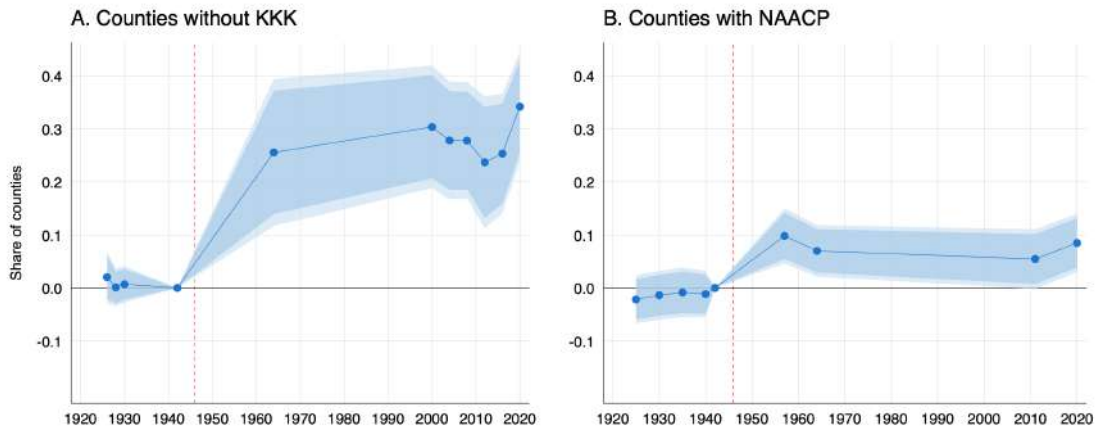
The broadcast leads to a significant reduction in the presence of KKK in Southern states by 25.6 percentage points in 1964. This effect is persistent and increasing over time. In 2020, 74 years after the broadcast of *The Adventures of Superman* in 1946, the share of counties without KKK chapters is more than 34.2 percentage points higher in areas that were covered by the broadcast compared to areas that were not covered.²³ In the period before the launch of Operation-

²³For the period post-2020, we consider only groups with ideology linked to KKK. Expanding the definition of hate-based groups in that period by including groups with related ideologies to KKK, such as white nationalism or

Intolerance, we do not observe any significant difference between these areas.

A similar pattern is observed for NAACP. Counties covered by the broadcast in 1946 have an increased probability of having a NAACP chapter by 9.8 percentage points in 1957, and by 7.0 percentage points in 1964. Similar to hate-based groups, the effects in the late 1950s and early 1960s are persistent over time. In 2020, we observe that the presence of NAACP is 8.5 percentage points larger in counties that were covered by the broadcast in 1946. Again, we observe no significant difference in the period before the launch of Operation Intolerance. If any, areas covered by the broadcast in 1946 tend to have a lower probability of having a NAACP chapter in the pre-broadcast period.²⁴

Figure 9: The effect on the presence of hate-based versus civil rights groups



Note. Estimates based on equation (3) including county and state by year fixed effects. Dependent variables are 0-1 indicator variables for the absence of KKK branches or the presence of at least one NAACP branch in the county in the corresponding period. In Panel A, the sample is restricted to Southern states. The shaded areas indicate the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance. Presence of KKK and NAACP is built using multiple data sources described in Section 3.3.

5.3 Attitudes and behavior in the target population

Attitudes We begin by studying whether the broadcast in 1946 had persistent effects on its listeners by focusing on changes in attitudes measured in different waves from 1949 to 1976 in a nationally-representative sample of the U.S. population. Using equation (4), controlling for income, gender, education, age at the time of the interview and for survey-wave fixed effects, we

neo-confederatism, does not change our conclusions.

²⁴Section E.2.2 in the Appendix shows that general conclusions hold when controlling for “maximum conductivity” coverage addressing concerns of the potentially endogenous placement of radio antennas.

compare responses across individuals interviewed at different points in time, but with a similar age in 1946 and a different exposure to the radio broadcast. To control for unobserved time trends at the state level, we additionally include state \times year fixed effects. We thus exploit within state variation across counties and age cohorts.

Figure 10 shows the effect of the broadcast on attitudes towards racism. Panel A focuses on agreement with racial segregation using a scale ranging from 1 to 3, where 1 indicates agreement with desegregation and 3 agreement with strict segregation. We observe a significant decrease in agreement with strict racial segregation only for individuals who were in the age range targeted by the broadcast (6–20 years old) in 1946.

The magnitude of the effect is a reduction of 0.131 points for individuals aged 6–10 in 1946, 0.152 points for individuals aged 11–15, respectively significant at the 1% level, and 0.127 points for individuals aged 16–20, significant at the 5% level. On the other hand, we do not observe any significant effect for individuals who were either too old to be targeted by the program, or who were too young to have listened to it (1–5 years old), or unborn at the time of the broadcast.

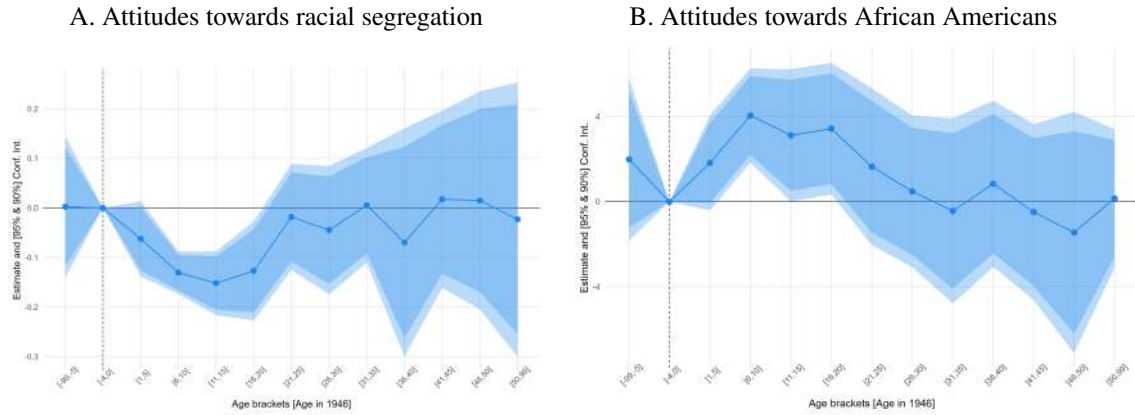
Next, Panel B shows the effects on self-reported feelings towards African Americans on a scale of 0–100, in which 0 indicates the most negative feeling and 100 indicates the most positive feeling.²⁵ Similar to attitudes towards racial segregation, the broadcast increases positive feelings towards African Americans in the cohorts targeted by the program. Again, we only observe a significant increase for the target age groups of 6–20. We estimate effects of 4.05, 3.12 and 3.43 additional points for the three targeted cohorts (6-10;11-15;16:20). Evaluated at the sample median, exposure to the broadcast is associated with an increase of 5.9% in scale points amongst individuals of the targeted group of individuals aged between 5 and 20 at the time of the broadcast.²⁶

These results indicate that exposure to the broadcast had a significant effect among its listeners. Attitudes come to reflect the message implicit in the episodes of *The Adventures of Superman* in 1946 – themes of tolerance, intolerance, and social movements promoting civil rights all became more prevalent among listeners. Importantly, this effect is persistent as we can detect effects on attitudes up to 20 years after the broadcast, when respondents have reached adulthood.

²⁵In the paper, we refer to this category as African American. In most surveys at the time, questions refer instead to people of “Black race”.

²⁶Section E.3.1 in the Appendix shows that general conclusions hold when controlling for “maximum conductivity” coverage addressing concerns of the potentially endogenous placement of radio antennas.

Figure 10: Attitudes towards racism



Note. Estimates based equation (4) controlling for income, gender, education, age at the time of the interview, survey-wave-, state times year- and county fixed effects. In Panel A, the dependent variable ranges from 1 to 3 (1 = desegregation, 2 = somewhere in between, 3 = strict segregation). In Panel B, the dependent variable is the reported feeling towards African Americans using a 0-100 scale (0 = negative, 100 = positive). The shaded areas indicates the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance. Further details about the data are reported in Section 3.4.

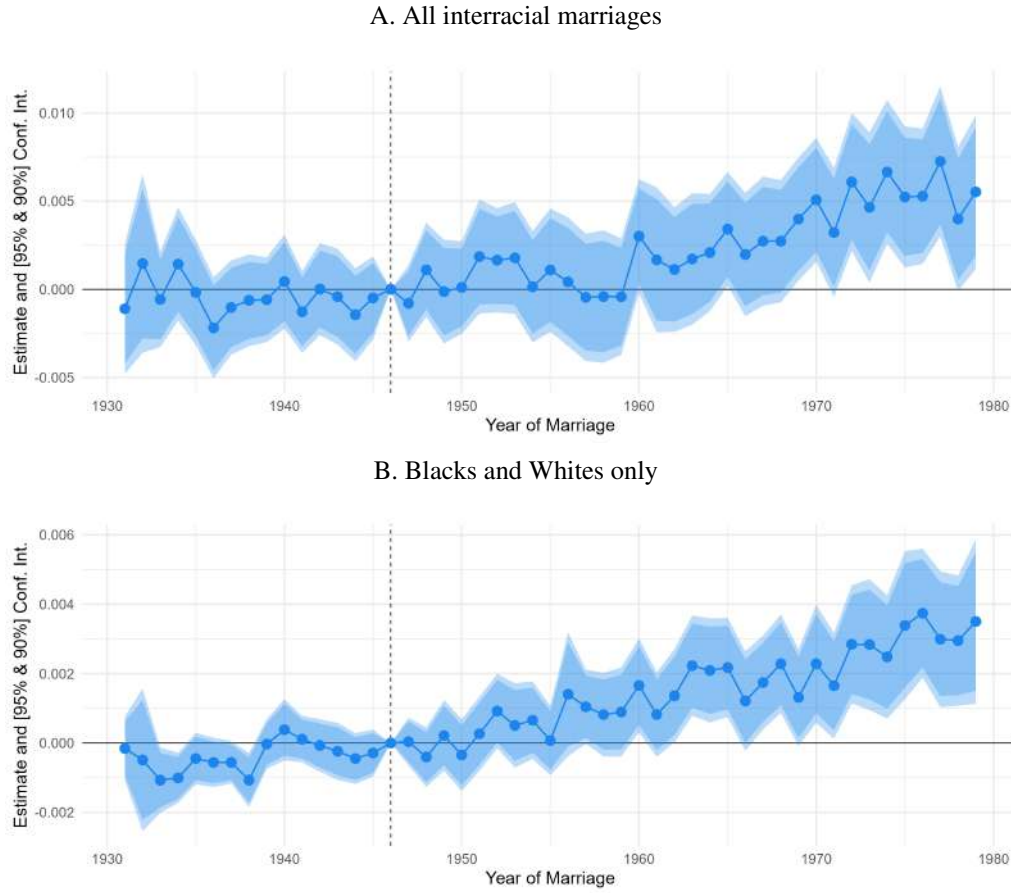
Interracial marriages Building upon our prior exploration of the radio show’s influence, we now turn our attention to interracial marriages. At the core of our investigation is the interracial marriage rate, specifically defined as the proportion of such unions within a given county for each year, spanning from 1930 to 1979.

The use of interracial marriage rates as a dependent variable provides a powerful measure of cultural assimilation. Sociologists have coined interracial marriages as “the final stage of assimilation” (Gordon, 1964). While survey results may potentially suffer from social-desirability bias, marriage decisions are a strong and robust measure of actual behavioral changes. This sentiment is mirrored in recent literature, which recognizes interracial marriage as a hallmark of successful assimilation (Fouka, 2020). Therefore, the increase in such unions perfectly fits with the inclusive narrative propagated by *The Adventures of Superman*, advocating for friendly relations between individuals of “all creeds and colors”.

In Figure 11, we illustrate the relationship between exposure to the radio show and the trajectory of interracial marriage rates. A notable increase in these rates emerges during the 1960s, aligning temporally with the civil rights movement. This upward trend gains momentum towards the close of the decade, potentially influenced by the landmark 1967 Supreme Court ruling in *Loving v. Virginia* that declared Anti-miscegenation laws unconstitutional. We document a consistent 0.5 percentage point surge in interracial unions starting in 1970. Figures E18 and E19 in the Appendix illustrate that results are robust to the inclusion of controls for maximum-conductivity

coverage.

Figure 11: Effect on interracial marriage rates



Note. Estimates based on equation (3) include county and state-by-year fixed effects. The dependent variable is the intermarriage share of the county between 1930 and 1979. The shaded areas indicate the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance. Standard errors are clustered at the county level.

Vietnam war participation Here we investigate whether exposure to the Superman program affected behavioural change. We do so by examining participation in the Vietnam War, which was possibly the most polarizing event for the generation born in the 1940s (see Section 2 for a discussion on the relationship between the war and the Civil Rights Movement).

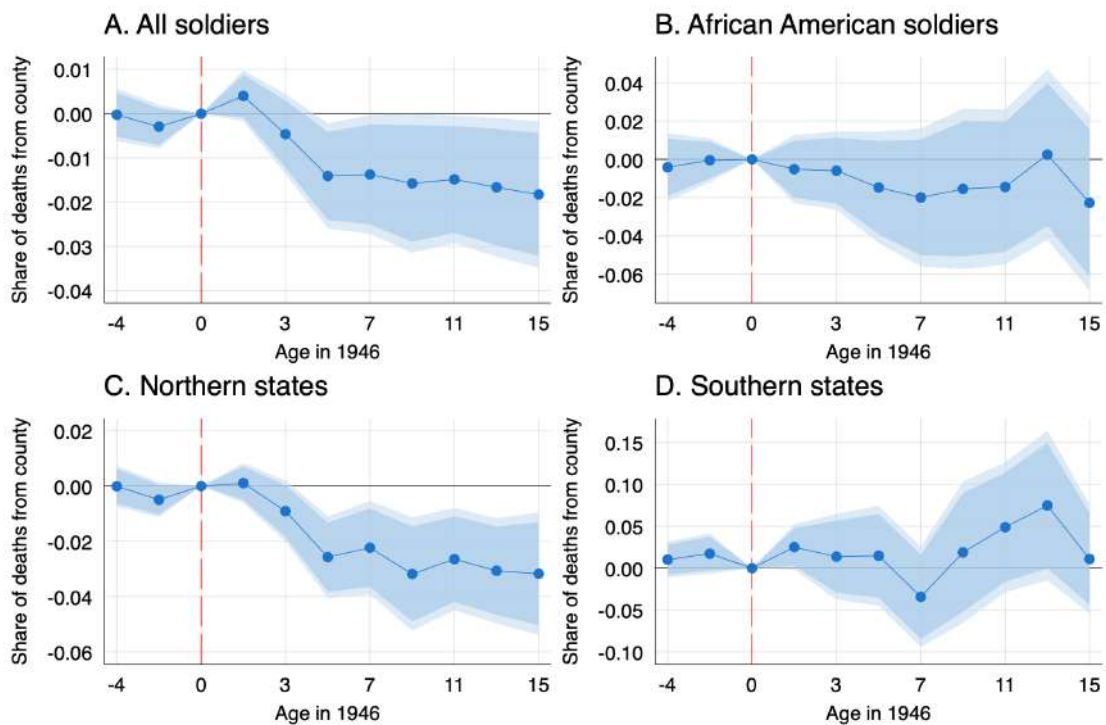
Figure 12 shows estimates of the effect of the broadcast on participation using equation (4). For each cohort, defined as age groups in 1946, we compare the share of casualties (multiplied by 100) attributed to counties covered by the broadcast in 1946 versus the share of casualties attributed to counties not covered. Panel A includes the sample of all soldiers, Panel B restricts the sample to African American soldiers, Panel C restricts the sample to Northern states, and Panel D

restricts the sample to Southern states.²⁷

The broadcast leads to a significant reduction in the participation in the Vietnam war for the cohorts targeted by the broadcast. We observe a reduction in participation of 0.02 percentage points starting for individuals that were 4 years old or older in 1946, while we do not observe any significant effect on younger individuals or on those that were not born in 1946 (Panel A).

Restricting the sample to African American soldiers (Panel B), we do not observe any significant effect, showing that the effect observed in Panel A is specific to white individuals, the group primarily targeted by the broadcast. Similarly, the effect is primarily driven by individuals from Northern states, for whom we observe effects up to 0.04 percentage points, rather than Southern states, for whom we do not observe any significant effect.

Figure 12: Effect on the participation in the Vietnam war



Note. Estimates based on equation (4). The dependent variable is the within-cohort share of deaths from a county (multiplied by 100). Panel A includes all soldiers, Panel B restricts the sample to African American soldiers, Panel C restricts the sample to Northern states, and Panel D restricts the sample to Southern State. Southern states include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Virginia, West Virginia and Texas. The shaded areas indicates the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the cohort born when Operation Intolerance was launched. Additional information about the data is provided in Section 3.

Overall, these results indicate that the broadcast resulted in significant behavioral changes

²⁷We do not observe casualties in the age groups beyond 15 in 1946.

in line with the effect on attitudes, highlighting that promoting equality and civil rights among children in 1946 translated into lower participation in a conflict closely tied with the rise of the Civil Rights Movement.²⁸

6 Conclusion

The oppressive and abhorrent practice of slavery was abolished in 1865. However, racist attitudes and intolerance towards African Americans have persisted. Minority communities elsewhere in the world also face similar prejudice. Racist depictions of minorities in films and popular media during the 20th century have often worsened these discriminatory attitudes (Ang, 2023). The relentless march of hatred towards minorities has been hastened by the spread of social media in the 21st century (Bursztn et al., 2019; Müller and Schwarz, 2020, 2021). This paper shows that media can itself provide an antidote to such venom.

We show how a radio-based intervention on the nationwide scale in the 1940s US provides insights on how we can combat racist and intolerant attitudes, in addition to influencing behavioral changes. In particular, exploiting a remarkable experiment that used the popular children’s radio program “The Adventures of Superman,” to inculcate tolerant attitudes, we uncover evidence that targeting children can be an effective way of combating intolerance. In addition to changing behavior and attitudes in the short run, the positive effects of the intervention persisted years later.

²⁸Section E.3.3 in the Appendix shows that general conclusions hold when controlling for “maximum conductivity” coverage addressing concerns of the potentially endogenous placement of radio antennas.

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APPENDIX
Supplementary material to *It's a Bird, it's a Plane, it's Superman! Using Mass Media to Fight Intolerance*

Alex Armand, Paul Atwell, Joseph Flavian Gomes, Giuseppe Musillo, Yannik Schenk

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A Radio network in 1946

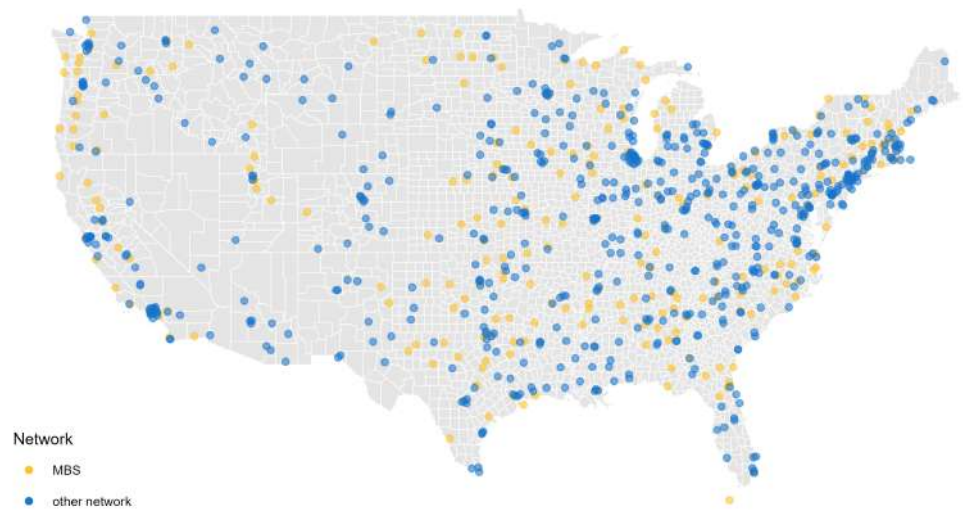
Figure A1 shows an example of information contained in the Broadcasting Yearbook. Figure A2 shows the geographical distribution of antennas, digitized from the Broadcasting Yearbook 1947, which refers to broadcasting in 1946.

Figure A1: Example of information from the Broadcasting Yearbook

DIRECTORY OF BROADCASTING STATIONS OF THE UNITED STATES									
*—Non-Commercial Station.		D—Day.	N—Night.	ST—Shares Time.	SH—Specified Hours.	U—Unlimited.	CP—Construction Permit Issued.		
LS—Local Sunset.		L—Limited Time with Dominant Station.				SA—Special Authorization.			
(Data corrected to February 15, 1947)									
ALABAMA—(Continued)									
City	Call Letters and Frequency in Kilocycles	Power in Watts	Name of Licensee Headquarters Address Telephone Number	Network	Executive Personnel		Representatives Transc. Library News Services		
HUNTSVILLE.....	WFUN 1450	250	Huntsville Bstg. Co. 410 W. Holmes St. 2424	.....	Joe Foster John Garrison Lauren Mickle John Garrison, Gen. Mgr.	Partnership Joe Keown, Prog. Dir. John Garrison, Prom. Mgr. Lauren Mickle, Chief Engr.	E. H. Duffey, Coml. Mgr. Joe Keown, Prog. Dir. John Garrison, Prom. Mgr. Lauren Mickle, Chief Engr.	World AP	
HUNTSVILLE.....	WHBS 1490	250	The Huntsville Times Co. Inc. Gallatin and Clinton Sts. 2845	ABC	A. L. Smith, Mgr. Mrs. Barbara Terrell, Natl. Coml. Mgr.	John P. Culver Jr., Prog. Dir. James L. Sanderson, Chief Engr.	Headley-Road AP		
JASPER.....	WWW3 1240	250	Bankhead Bstg. Co. Inc. Jasper 24	.....	W. W. Bankhead, Owner James E. Reese, Gen. & Coml. Mgr. Charles Metcalfe, Prog. Dir.	Freda Hilton, Prom. Mgr. Jack Copeland, Chief Engr.	Thesaurus World AP		
MOBILE 9.....	WALA 1410	5,600	Pape Bstg. Co. 106 St. Joseph St. 3-8756	NBC	W. O. Pape, Owner H. K. Martin, Gen. Mgr.	A. C. Holman, Prog. Dir. R. B. Hurley, Chief Engr.	Headley-Road Standard AP		
MOBILE 7.....	WKAB (Construction permit) 840	1,000-D	Pursley Bstg. Service P. O. Box 1306	.....	Claude Pursley Louise Pursley	Partners	D. W. Lang Jr., Mgr. & Coml. Mgr.		
MOBILE.....	WKRQ 710	1,000-D	Giddens & Rester 205 Government St. 2-8373	MBS	T. J. Rester Kenneth R. Giddens F. E. Busby, Gen. Mgr.	Partners Lynn Williams, Prog. Dir. & Prom. Mgr. W. H. Murphy, Chief Engr.	Wood Lang-Worth Standard AP		
MOBILE 15.....	WMOB 1230	250	Nunn Bstg. Corp. 458 Government St. 2-4566	ABC Ala.	Gilmore N. Nunn, Pres. Archie S. Grimalds, Gen. & Coml. Mgr.	Wallace B. Dunlap, Prog. Dir. Joseph S. Muth, Prom. Mgr. T. L. Greenwood, Chief Engr.	Thesaurus World UP		
MONTGOMERY.....	WAFX (Construction permit) 1600	1,000	United Bstg. Co. Inc. Montgomery	ABC	T. E. Martin, Pres. John S. Allen, Vice-Pres. & Gen. Mgr.	Chas. H. Allen, Coml. Mgr. Cecil Mackey, Prog. Dir. Paul Umery, Chief Engr.	Walker UP		
MONTGOMERY 2.....	WCOV 1240	250	G. W. Covington Jr. Exchange Hotel 5781	CBS	G. W. Covington Jr., Owner & Mgr. R. B. Raney, Coml. Mgr.	Weston Britt, Prog. Dir. E. J. Duke, Prom. Mgr. W. D. Weatherly, Chief Engr.	Wilson Standard INS		
MONTGOMERY 4.....	WMGT 800	1,000-D	Dixie Bstg. Co. Dexter Ave. and Perry St. 6245	MBS	Dr. S. D. Suggs, Pres. Leland Childs, Gen. & Coml. Mgr.	E. Caldwell Stewart, Prog. Dir. Edward L. De Mottis, Prom. Mgr. John D. Lamar, Chief Engr.	Radio Advertising World INS		

Note. Extract from the Broadcasting Yearbook 1947 showing some of the active antennas in Alabama.

Figure A2: Location of radio antennas in 1946



Note. This figure shows the antenna location of the complete U.S. radio network in 1946. The location of each antenna is geo-located using information about the city and the state of the antenna, as printed in the Broadcasting Yearbook 1947.

Figure A3: US ground conductivity map from 1954



Note. Map of estimated effective ground conductivity in the United States published by the Federal Communications Commission (FCC) in 1954. This data is used to predict the propagation of AM signals across the United States. A higher ground conductivity indicates better AM propagation characteristics. The map shows that the ground conductivity in the U.S. ranges between 0.5 and 30 millimhos (or millisiemens) per meter.

B Additional information about *The Adventures of Superman*

B.1 Plot summary of episodes

The Hate Mongers Organisation - Broadcast Dates: 16/04/1946 to 20/05/1946 Clark has just arrived at the hospital to find Jimmy in the waiting room. Danny O’Neil is on the Danger List. He was badly beaten by Muggs and Skinny and could have a brain concussion. Father Francis Shian of the Saint Mary’s Catholic Church is with the boy. Shian, Jimmy and Clark talk with Danny. He tells them who had attacked him, and he fears that Muggs and his friends will do something to his mother.

Shian then explains that he had met with local religious leaders from Protestant and Jewish faiths along with a school principal and three men to discuss the creation of Unity House, a community center and playground *where children of every race, ethnic background and spiritual belief can play and interact in order to learn that all people are the same*. However, the members of the Unity House committee have received threatening letters after news of their efforts had gotten out. Father Shian is certain that the people who sent the notes ordered Muggs to start the fire on Morton Street.

Clark has a plan that will hopefully bring down the hate mongers organization “Guardians of America”, that is trying to prevent the creation of Unity House. Jimmy is essential to the plan, and it could mean that the cub reporter will be risking his life. Should the police arrest Muggs and his friends, the group behind the threats to the Unity House committee will go into hiding. Jimmy is to pose as a hoodlum to gain Muggs’ confidence and join his gang. Should Jimmy be in danger, Superman will provide protection.

The Clan of the Fiery Cross - Broadcast Dates: 10/06/1946 to 01/07/1946 Two boys, Tommy Lee and Chuck Riggs, are fighting when Jimmy arrives. Chuck has been acting like a sore loser since Tommy, who just moved into the neighborhood, replaced him as number one pitcher on Union House baseball team. During practice, Chuck crowds the home plate and gets hit in the head by a ball thrown by Tommy. Chuck believes Tommy did it on purpose, and Jimmy is forced to remove the former from the team because of his attitude toward Tommy.

Chuck tells the story to his Uncle Matt. Knowing Tommy's father Doctor Wan Lee, an Asian American, was promoted to the Metropolis Health Department as a bacteriologist, Matt gets an idea. He makes his nephew believe that Tommy beamed him on purpose and invites the boy to a secret meeting of what he calls "true Americans." Dressed in a white robe, he then takes Chuck to a secluded place where a wooden cross burns. Other similarly dressed men are in the area. Uncle Mack reveals that he's the leader of The Clan of the Fiery Cross. Chuck is coached into saying that Tommy Lee was trying to kill him in order to keep his position on the Unity House baseball team. Chuck says that this will help Lee's people take over America. *The Clan of the Fiery Cross is set to cleanse the country of those that are not "True Americans."*

George Latimer, Crooked Political Boss - Broadcast Dates: 03/09/1946 to 25/09/1946 Joe Martin, a war hero and brother of Beany, a copy boy for the Daily Planet, joins his Jewish friend Sam Robbins in protesting against Governor Frank C. Wheeler's prejudiced hiring policies. These policies unjustly deny job opportunities to returning war veterans based on their race and religion. Joe and Sam, firm believers in equal rights for everyone, are determined to challenge the governor's discriminatory practices. However, their approaches differ, with Joe suggesting a more confrontational tactic of storming the capitol building, while Sam prefers a peaceful approach.

Tensions continue to mount as Governor Wheeler, influenced by the corrupt George Latimer, attempts to suppress the dissent by fueling hatred towards foreigners and minorities. Through an inflammatory speech, the governor stokes anger among the war veterans, resulting in chaos and the state police resorting to firing upon the protesters. Tragically, Joe is shot during the ensuing melee, prompting his brother Beany, along with Clark Kent and Perry White, to pledge their support in seeking justice.

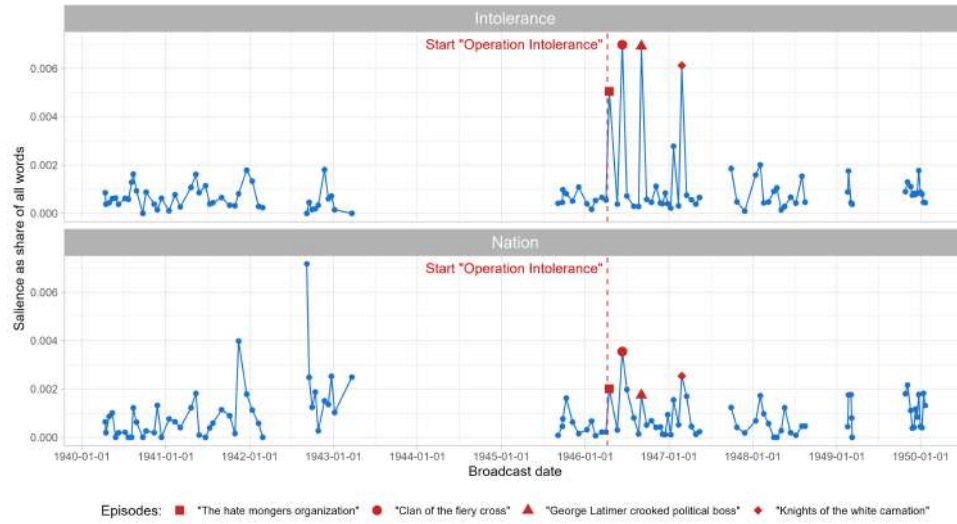
Clark, taking it upon himself to investigate the incident, begins unraveling the truth behind the shooting. It emerges that Latimer manipulated the police into using their weapons and framed Sam Robbins for the crime. With a determination to clear Sam's name, Clark delves deeper into the matter and uncovers Sergeant Adams' testimony, revealing that the officers involved did not want to harm their fellow soldiers. The key to exonerating them lies in identifying the type of bullet that struck Joe.

Knights of the White Carnation - Broadcast Dates: 26/02/1947 to 17/03/1947 In the aristocratic home of Vincent Kirby, a secret organization called the *Knights of the White Carnation* is plotting to eliminate what they consider "Un-American foreigners" from the Metropolis High School Varsity Basketball Team. Charles Canfield, a member who disagrees with the organization's racist agenda, plans to expose them to the press. However, he is mysteriously murdered, leading Clark Kent and Jimmy Olsen to investigate the case. As they dig deeper, they discover that four of the five targeted players have been suspended for gambling, but they suspect foul play. Clark, using his alter ego Superman, saves the day when he prevents a stampede at a basketball game. The coach reveals that he was coerced by the chairman of the Metropolis School Board to

remove the players.

B.2 Topic analysis with prolonged time series

Figure B4: Prevalence of topics by Superman episode



Note. Figures indicate the share of words in each episode transcript that refer to intolerance (upper panel) or to the nation (lower panel) for all available episodes between February 1940 and February 1950. The breaks in the time line are due to periods for which episodes are partially or fully missing. Data is derived from transcripts of the episodes. We remove stop words and apply basic stemming before calculating frequencies.

B.3 Historical evidence from newspaper articles

Figure B5: Operation Intolerance as historical experiment in the radio industry

Reformers Challenged by Superman

Excitement, Message Are Blended in Child Series

By WILLIAM B. LEWIS
Vice President and Radio Director
Kellogg & Eckhardt

SUPERMAN'S "Operation Intolerance" had its beginning at a Kellogg & Eckhardt plan board meeting last October—and before we put the new Superman on the air just two weeks ago we had almost given up the idea that a children's program could be socially conscious as well as entertaining.



Mr. Lewis

Most of radio now knows what we are currently trying to accomplish with our Superman series on behalf of our client, the Kellogg Co. Superman has been a Kellogg radio property since 1943. We do not feel that the general run of Superman stories has been harmful in any way to its millions of juvenile followers, who have comprised one of the most loyal audiences in radio history.

However, we did feel that the time had come for a definite concentrated effort in the realm which had previously been untouched by radio programs built for juveniles—the realm of everyday life, with its problems and solutions spelled out in strong language that no child could misunderstand.

Enemy of Intolerance

When the subject of pitting Superman against intolerance, juvenile delinquency and the allied subjects which bulk so largely in American consciousness was first broached, it seemed a logical and fairly simple idea. Bob Maxwell, of Superman Inc., was most enthusiastic, for the idea was one which had long been a particular pet of his own. We brought the matter to the attention of the Kellogg Co. and recommended that the experi-

ment—for experiment it is—be tried. W. H. Vanderplugg, president of Kellogg, concurred heartily, with the only stipulation that the program be kept as exciting as the series had been up to the time of change.

So it was that October 1945, found Superman Inc. and K&E looking for writers who could combine cliff-hanging technique with crusades against intolerance, state a case and a solution in terms which children could understand, keep the character of Superman alive and combine exciting entertainment with a plain spoken message.

The Norman Corwin technique is a vastly different radio concept from the slam bang artifices needed to keep juvenile interest: after 15 minutes a day, five days a week. Another stumbling block, which tripped many writers, was the commission of crime without being able to explain the actions or catch the culprits on the same program.

Lesson Fought

On a program such as *Mr. District Attorney*, the entire story is wrapped up and happily finished in 30 minutes. Our problem was to work out a way in which children who heard two or three episodes of Superman during a week wouldn't learn about throwing stones at a church—and miss the message that such tactics are wrong.

During the winter of 1945, and the spring months of 1946, we (Superman and the agency) must have seen scores of scripts and ideas for the new story line. Some were good, others missed the point. None, however, combined the two essential factors of entertainment and educational value which we were seeking. Actually, we had almost given up the idea when a writer finally came through with the outline and script now riding the Mutual air.

We believe that the experiment currently being conducted is of interest to the entire radio industry. Many Mutual stations have written and told us that they heartily approve the action we have taken. Religious, educational and veterans

Changes Made in WLS Weather Report Service

IN LINE with the expansion of the WLS Chicago Weather Service beyond its present 44 weather broadcasts a week, Harry Geise, meteorologist and weather expert, returns to the station to interpret weather information and give application to crop conditions on the farm. Mr. Geise has been in the aurology section of the Marine Corps for the past 2½ years.

A special feature will be a seven day forecast prepared by meteorologist Geise, issued by permission of the United States Weather Bureau.

organizations have pitched in with a will. The National Conference for Christians & Jews has been especially helpful.

There's one point I'd like to make which may be a signal for other agencies and sponsors who may come after us in this field. It's about time for the organizations who find enough energy to rap children's programs and radio public service in general to put up or shut up! That may be rude—but it's honest. If these organizations get behind a campaign such as Superman is conducting and back it down the line in their publications, meetings and by word of mouth, they will help to get the kind of programs they want on the air.

If these organizations only pay lip service to the kind of ideals which they ask for in radio programming, they will find themselves being ignored in future radio thought.

Henry Morgan, in a recent article, blamed radio audiences for the ills of broadcasting. The Superman experiment should determine whether or not some people mean what they say about radio.

Converts GE Sets

TELEVISION TECHNICIANS Joe, Brooklyn, is handling conversion of General Electric radio receivers in New York area to receive stations at new frequencies. Charge is \$15. Owners of RCA and DeLmont sets are paying \$30 for the conversion.

KID SHOWS on the air, like the weather, have been the subject of much conversation, largely condemnatory. Individually and in their organizations parents, teachers and others concerned with the welfare and education of American youth have urged that radio's juvenile fare be made less fantastic, more reasonable. Now "Superman," never one to avoid a challenge, has taken up this one. Bill Lewis, in this space, describes the new Superman pattern, calls for the reformers to work for its success if they really mean what they have been saying all these years.

Brochure Issued by ABC On Video Anniversary

THIRTY-PAGE brochure has been issued by ABC on the occasion of the network's first year in television, outlining its programming, special events and public service features since establishment of ABC television division in February 1945. Entitled *In Television, Too . . . The Show's The Thing*, booklet contains an introductory note by Mark Woods, ABC president, describing the progress of the network's first video year.

Concluding portion of the brochure deals with ABC's special public service shows for V-E Day, V-J Day and Navy Day, and children's programs such as the *Singing Lady* and the Christmas holiday week schedule which ABC televised last December.

The
PAYOFF
Station
In the West's Most
Concentrated Area
KSFO
UBC UBC
San Francisco
Universal Network's
Key Station for
Northern California

BROADCASTING • Telecasting

Serving
The Third Largest Market
in the
Fourth Richest State
•
WCOL
COLUMBUS
•
The Listening Habit of Central Ohio
•
Represented by
THE HEADLEY-REED CO.

May 13, 1946 • Page 75

Note. Source: Broadcasting, 13/05/1946.

Figure B6: Evidence of political endorsements

A. Harry S. Truman

B. Henry A. Wallace

THE PITTSBURGH PRESS

Superman 'Reformer'

Will Combat Intolerance

Superman zooms off on a new adventure starting Tuesday, April 16 at 5:15 p. m. over KQV, with the avowed intention of combating bigotry and intolerance.

Superman is the first network children's radio series to take up the cudgels for tolerance, in support of a movement which has the blessing of every church and the endorsement of President Truman as well as a large group of organizations. Scripts for the new series were prepared with the co-operation of the National Conference of Christians and Jews.

"The plan for using this juvenile series to generate the principles of brotherhood has been in the works for some time," Robert Maxwell, producer of Superman, declared today. "We felt an obligation to perform a public service in addition to entertaining the youngsters. Superman reaches a large audience of children whose opinions and characters are being formed in a mold which will influence their entire lives. To influence them constructively is our purpose."

The new Superman theme has the hearty endorsement of the sponsor, whose president, W. H. Vanderploeg, declared: "For some time we have been planning a more direct approach to the problems now facing young boys and girls in their schools, their social clubs and their homes. We felt that given the proper entertainment values as a base, children would listen to a direct and exciting Superman series with a thoroughly American message of brotherhood. We hope, with the aid of our new Superman story approach, that the children of America will continue to be friendly with all other children, regardless of difference in race, creed or color."

The advertising agency for the company, in a statement heartily concurred with their client about the espousing of the new "Superman" story line. W. B. Lewis, vice president and radio director of the agency, said: "The story will be just as exciting as the usual Superman adventures. In fact, we think it will be even more exciting. The difference lies in the fact that Superman, if this first experiment is successful, will go to war against juvenile delinquency, racial intolerance, school absenteeism and the other problems of child behaviorism which bulk so large in the public consciousness."

Superman will continue to be portrayed by Clayton "Bud" Collyer, who has enacted the part since the inception of the program six years ago. Collyer is enthused about the new story line, because it's just what he has been preaching as a Sunday School teacher in Poundridge, N. Y.



LEAR

With the explicit approval by professional dancers are well known in ballroom dancing the easiest and most graceful. At Foreman's a strictly private dancing service is guaranteed.

Private Trial

Open Daily 11 A. M.

FOREMAN

Loew's Penn Theater Bldg
ENTRANCE 604

**BUYING
NEW CARS**



**Save
as 1/3 on
financing**

**But . . . Before
YOUR CAR—**

We issue a Bank-Draft authorizing you to draw on any dealer you select. You can pay any time within 90 days.

The convenient method is not due until after you use the draft. We will advance through any bank you prefer, so you are protected when you take delivery.

Ask any insurance agent about the Potlatch Plan or discuss with us.

'Superman' Honored

SECRETARY OF COMMERCE

Henry A. Wallace has commended the tolerance theme inaugurated on the *Superman* series heard on MBS, with the following statement: "I am happy to learn that you are planning to use *Superman* for the purpose of teaching children that Democracy includes the idea of tolerance and equal opportunity for all races, creeds and colors. It is much easier to plant the truth in young minds before anti-social teachings have taken firm root." Program also has received citations and commendations from the Calvin Newspaper Service, the Associated Negro Press, the Child Study Association of America and many religious organizations throughout the country. Program is sponsored by Kellogg Co., Battle Creek, Mich. (Pep).

Note. Panel A is extracted from The Akron Beacon Journal, 22/05/1946. Panel B is extracted from the Broadcasting Yearbook 1946.

Figure B7: Evidence of post-broadcast increase in Hooper Ratings

AROUND THE DIAL

Superman Wins Over Intolerance

Young Fans Accept Moralizing; Program's Hooper Rating Rises

SUPERMAN has unleashed his super-powers against intolerance and juvenile delinquency. He has become a moral force as sincere and full of purpose as the most zealous Sunday school teacher. And so far his young admirers haven't minded one bit.

Apparently they don't object to having their radio entertainment teach a lesson—as long as the lesson is so camouflaged by the usual blood-and-thunder trappings that they aren't even aware that it is a lesson.

IN FACT, the latest Hooper survey—the measuring stick of radio—reveals that Superman is a lot more popular since he started serving a purpose other than that of making his listeners' cowlicks stand on end.

In the previous Hooper poll he had rated fourth among children's radio programs. Several weeks ago he started his tolerance campaign, and his popularity dramatically shot up into first place among all juvenile shows.

THE SECRET of his success is simple, his representatives say. He simply sugar-coats his constructive messages.

"At no time is Superman mounting the soap box and preaching," explain his spokesmen with dignity.

"What he has to say is made to sound perfectly logical and appropriate to the script. The producers of Superman keep their minds on the issue, which is to entertain."

THEY IMPLY rather smugly that if he were so inclined Superman could teach the teachers a thing or two.

"All too seldom do education's leaders recognize," they assert, "that to win mass audiences a program must be top-grade listening, produced, as it were, with showmanship."

"By all odds, the policy followed by Superman seems the most sensible one, and one which educators could study with considerable care."

FOR THE benefit of said educators and of all non-parents who may not be in the habit of tuning their radios to WHKK daily at 5:15, Superman's adventures have been going something like this:

For the last few weeks he has concentrated on fighting intolerance. He has been helping his

young, non-super friend, Jim, smash a ring called "Guardians of America."

Members of the ring were wrecking the business places of Jews, desecrating Catholic churches, attacking Negroes — performing easily recognizable acts of intolerance against groups which were clearly labeled so that young listeners could not miss the point.

MONDAY afternoon the ring was finally smashed. Jim got in the clutches of the intolerant villains, Superman arrived to rescue him in the nick of time, and it was discovered that the leader of the gang was a Nazi spy.

Then yesterday, with hardly a pause for breath, Superman began his campaign against delinquency.

He wasn't on hand himself, because things hadn't gotten bad enough yet to require his services. But the Metropolis newspaper started a campaign to clean up the city's slums, "breeding place of delinquency."

Tonight's Tuning

6—WAKR, the Lone Ranger helps a young painter prove to his father that art has its place.

6:15—WADC, Jack Smith show; Burl Ives, guest.

6:30—WADC, Ellery Queen enlists Lucille Ball's aid in solving a movie-land murder mystery.

7—WTAM, Mr. and

Mrs. North "meet a phoney at Coney".

7:30—WHKK, Bert Lahr show; Ruth Davey sings "Do You Love Me". WADC, Dr. Christian helps



RANDY

This is Randy Stuart, the pretty songstress on the Jack Carson show. You'll hear her tonight at 7 over WADC.

WAR ADMINISTRATION

Now Has Sales R

TWO WAIT

West 7th and Quigley
20001 Euclid Av.

From 9 A. M. to 4 P
Friday until 1

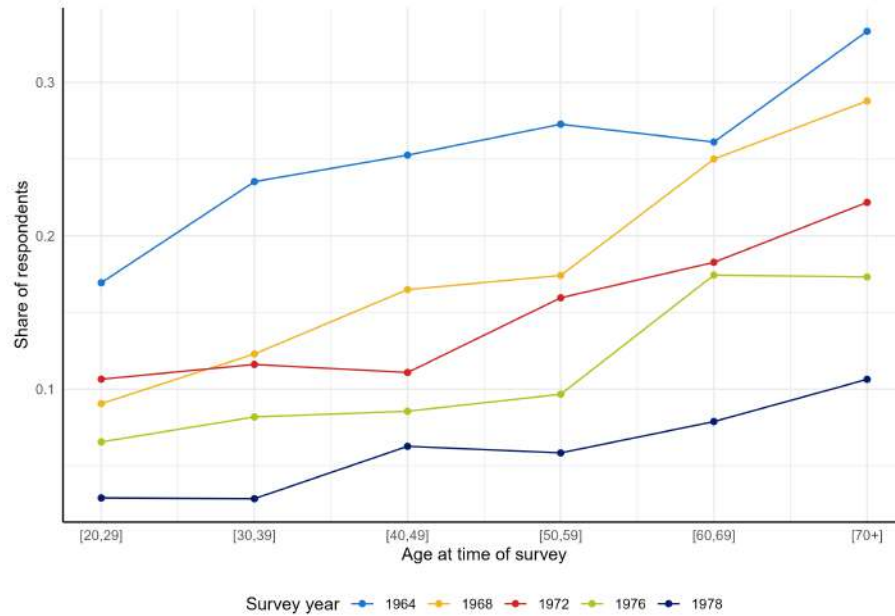
FOR: INSP PURCHASE...

2000 Price-To

Note. Source: The Akron Beacon Journal, 22/05/1946.

C Descriptive statistics about attitudes towards segregation

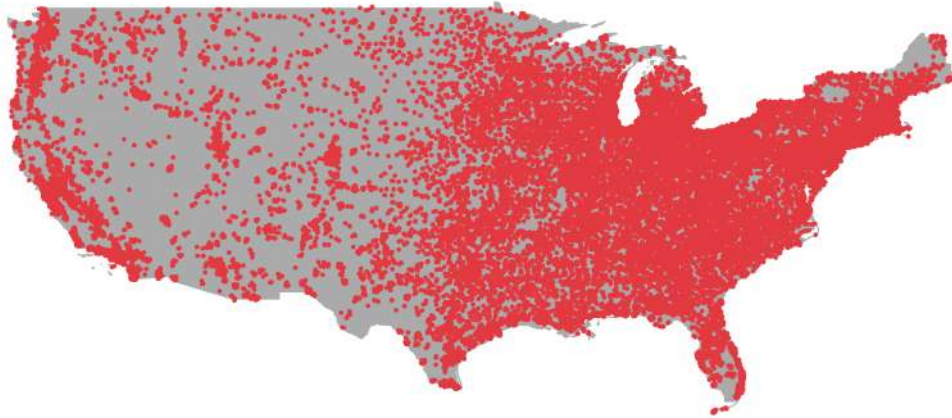
Figure C8: Support for strict segregation by age and survey year



Note. The figure shows the share of individuals supporting strict segregation by 10 year age cohorts, based on age at the time surveyed and survey year. Data stems from the ANES survey waves 1964, 1968, 1972, 1976 and 1978.

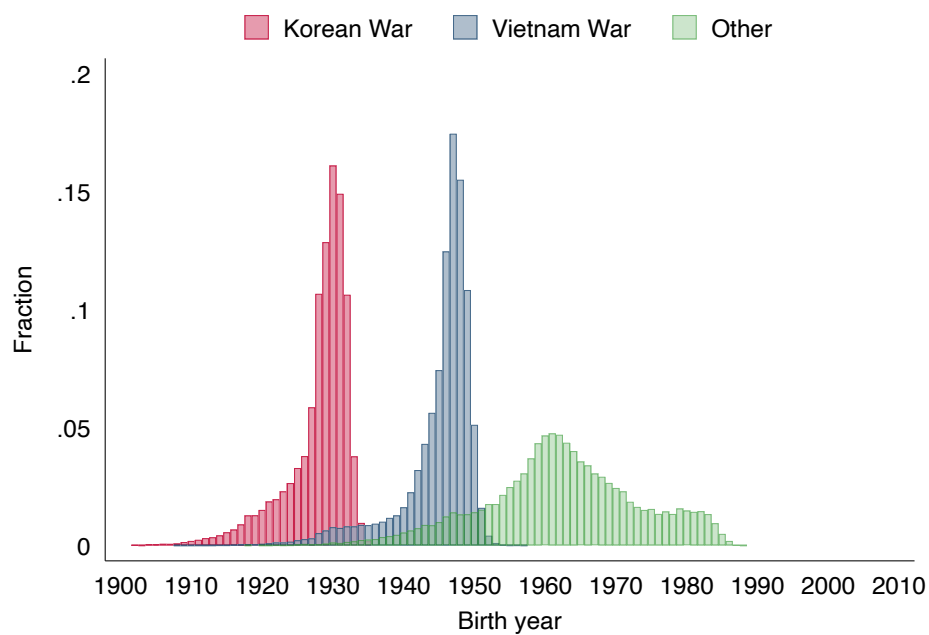
D Descriptive statistics about DCAS

Figure D9: Distribution of U.S. casualties during the Vietnam wars



Note. The figure shows the geographical distribution of casualties using the home of record. All casualties are attributed to the conflict in Vietnam.

Figure D10: Casualties, by birth year and conflict



Note. The figure shows the distribution of reported war casualties by birth year of birth and conflict.

E Main results controlling for “maximum conductivity” coverage

As laid out in Section 4, our core identification is based on a sudden, and unforeseen shift in the programming of a specific set of radio stations. The reception of the broadcast may have been correlated to local characteristics that could have influenced civil rights related dynamics later, on after treatment (e.g. presence of Universities or the distance to major cities). This concern is somewhat alleviated by a careful analysis of pre-existing trends between treated and untreated units, and by our broad set of fixed effects, exploiting the panel dimensions of our sample.

Nevertheless, we opt to employ a secondary empirical strategy inspired by [Olken \(2009\)](#), exploiting plausibly exogenous variation in signal strength resulting from geographic features. Topographic obstacles can create exogenous variation in signal strength for FM radio operating through line-of-sight propagation. The low to mid frequency waves used for AM broadcasting can surpass these topographic impediments. This implies that the methodology suggested by [Olken \(2009\)](#) and implemented by [Armand et al. \(2020\)](#), for example, is not valid during the AM broadcasting era. The main determinant of AM daytime signal propagation is the ground conductivity between antenna and receiver.

We assume maximally conductive soil for the entire US and calculate a variant of “free field” signal strength, that we term “maximum conductivity” signal strength. It is important to note that radio operators at the time of the broadcast had only imperfect information about the signal reach, ahead of the construction of the antenna. Calculated coverage based on “maximum conductivity” signal strength then allows us to control for remaining unobserved heterogeneity, uncaptured by fixed effects, and unrevealed by our pre-trend analysis. This includes county features correlated with the signal strength or distance to the next antenna.

We augment specifications laid out in Equations 3 and 4 in Section 4, by a set of interaction terms between all time dummies and “maximum conductivity” area coverage:

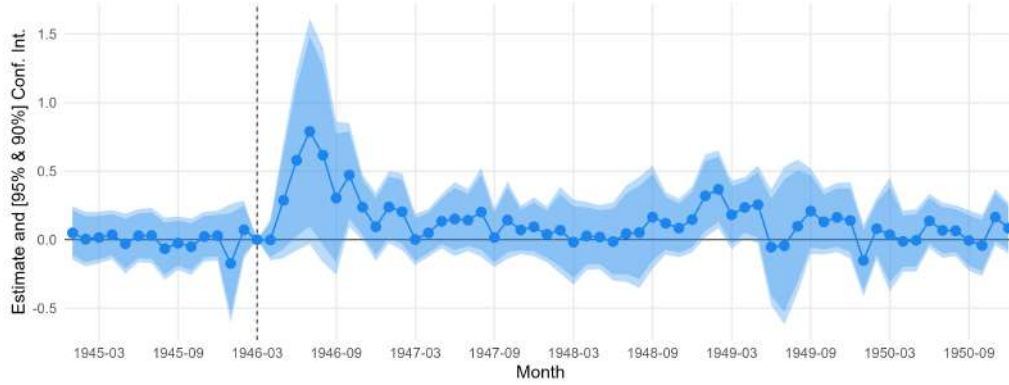
$$(5) \quad Y_{c,t} = \sum_{\tau=-a}^a \gamma_{\tau} T_{\tau} \cdot R_c^{1946} + \sum_{\tau=-a}^a \gamma_{\tau} T_{\tau} \cdot free_c^{1946} + \mu_c + \mu_{s,t} + \epsilon_{c,t}$$

$$(6) \quad Y_{ihc,t} = \sum_{\tau=-a}^a \gamma_{\tau} D_{\tau} \cdot R_c^{1946} + \sum_{\tau=-a}^a \gamma_{\tau} D_{\tau} \cdot free_c^{1946} + X'_{ihc,t} \lambda + \mu_h + \mu_c + \mu_{s,t} + \epsilon_{ihc,t}$$

In the remainder of this section, we present our principal results following the sequence established in the main paper, with additional inclusion of period/cohort times “maximum conductivity” coverage interaction terms. Lending additional support to our main identification assumptions, results are generally robust using this alternative methodology.

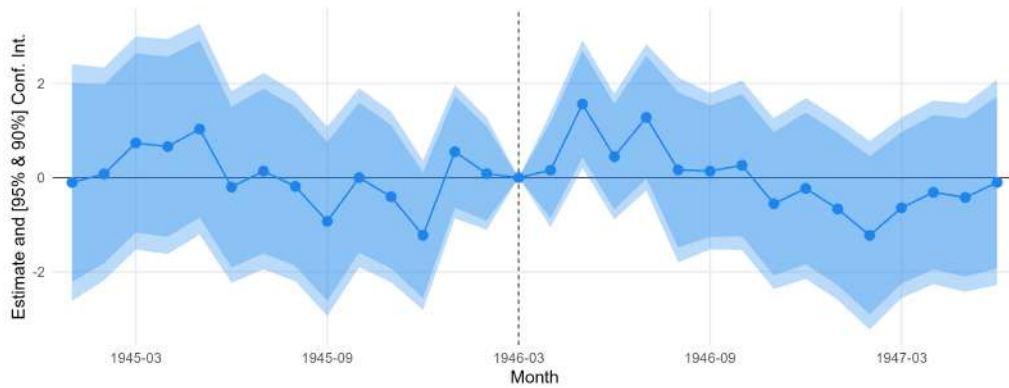
E.1 Radio broadcasting and public discourse

Figure E11: Salience of KKK in local newspapers controlling for “maximum conductivity” coverage



Note. Estimates based on equation (5) using county, month and state-year fixed effects and month times “maximum conductivity” coverage interaction terms. In Panel A, the dependent variable is the share of pages containing at least one reference to Superman. In Panel B, the dependent variable is the share of pages containing at least one reference to KKK and related words. Details about the measurement are provided in Section 3.2. The vertical line indicates the beginning of Operation Intolerance with the broadcast of the episodes of *The Hate Mongers Organisation*.

*Figure E12: Salience of *The adventures of Superman* in local newspapers controlling for “maximum conductivity” coverage*

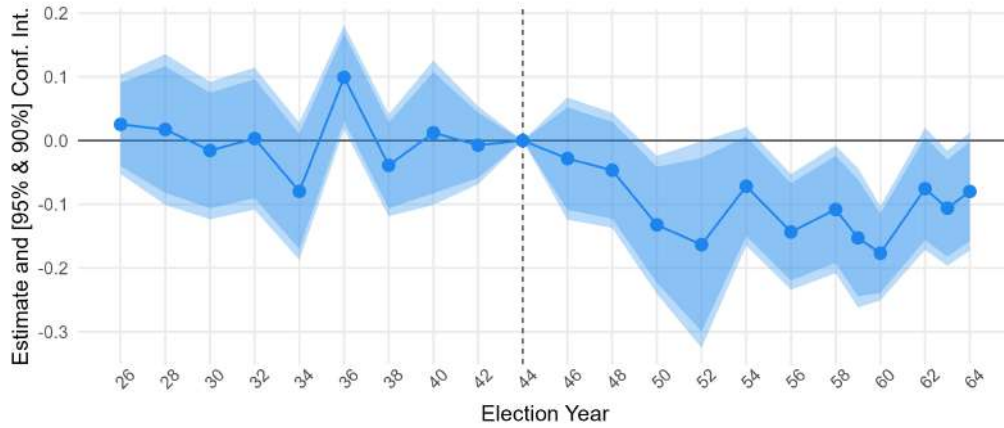


Note. Estimates based on equation (5) using county, month and state-year fixed effects and month times “maximum conductivity” coverage interaction terms. In Panel A, the dependent variable is the share of pages containing at least one reference to Superman. In Panel B, the dependent variable is the share of pages containing at least one reference to KKK and related words. Details about the measurement are provided in Section 3.2. The vertical line indicates the beginning of Operation Intolerance with the broadcast of the episodes of *The Hate Mongers Organisation*. The show left the MBS network in July 1946.

E.2 Social mobilization and collective action

E.2.1 Voting in the Deep South

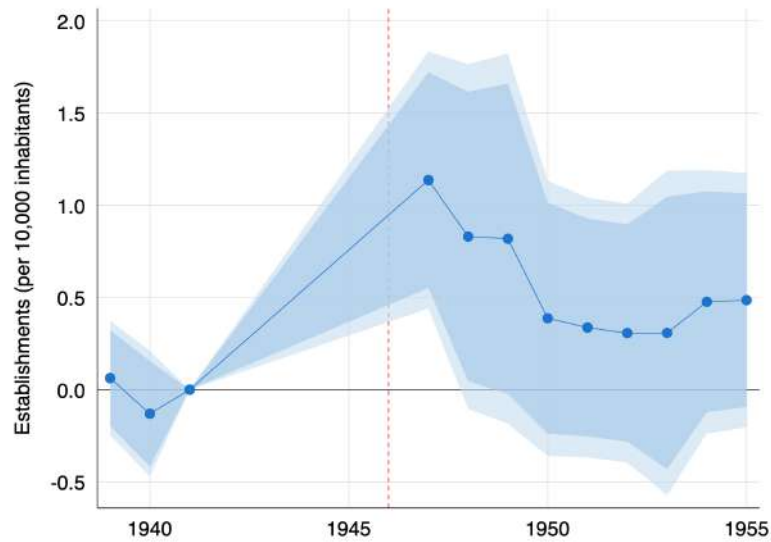
Figure E13: The effect on segregationist voting in the Deep South controlling for “maximum conductivity” coverage



Note. Estimates based on equation (5) including state-by-year fixed effects and year times “maximum conductivity” coverage interaction terms. The dependent variable is the vote share of the segregationist candidate across all elections. Segregationist candidates are classified using the data-driven approach described in Section 3.3. The shaded areas indicate the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance.

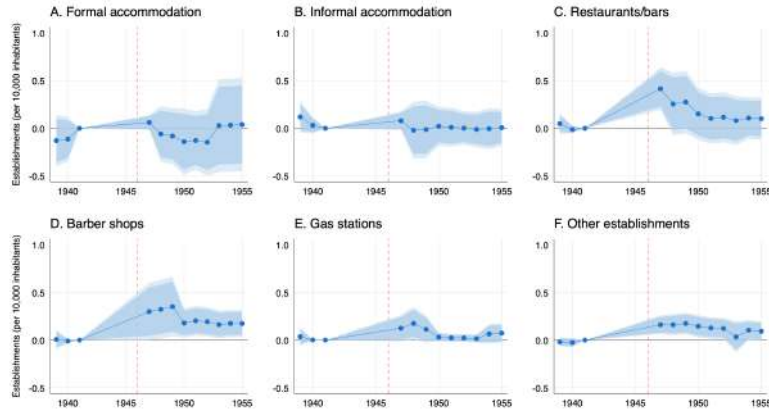
E.2.2 Racial Segregation and the proliferation of hate-based versus civil rights groups

Figure E14: The effect on racial segregation in the provision of services



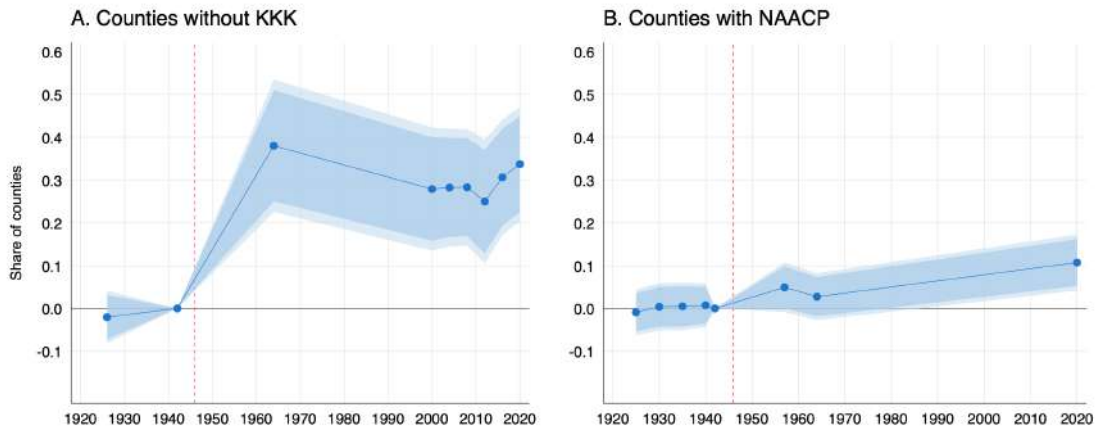
Note. Estimates based on equation (5) including county and state by year fixed effects and year times “maximum conductivity” coverage interaction terms. The dependent variable is the county-level total number of establishments with non-discriminatory services to African Americans as included in the Green Books. Data are described in Cook et al. (2023). The number of establishments is normalized by 10,000 inhabitants. We consider all types of services: formal and informal accommodation, restaurants and bars, barber shops and beauty parlors, gas stations, and other types of services, such as pharmacies and facilities for entertainment and recreation. The shaded areas indicate the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance. Refer to Section 3.3 for further details about data.

Figure E15: The effect on racial segregation in the provision of services



Note. Estimates based on equation (5) including county and state by year fixed effects and year times “maximum conductivity” coverage interaction terms. The dependent variable is the county-level total number of establishments with non-discriminatory services to African Americans as included in the Green Books. Data are described in Cook et al. (2023). The number of establishments is normalized by 10,000 inhabitants. We consider all types of services: formal and informal accommodation, restaurants and bars, barber shops and beauty parlors, gas stations, and other types of services, such as pharmacies and facilities for entertainment and recreation. The shaded areas indicates the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance. Refer to Section 3.3 for further details about data.

Figure E16: The effect on the presence of hate-based versus civil rights groups

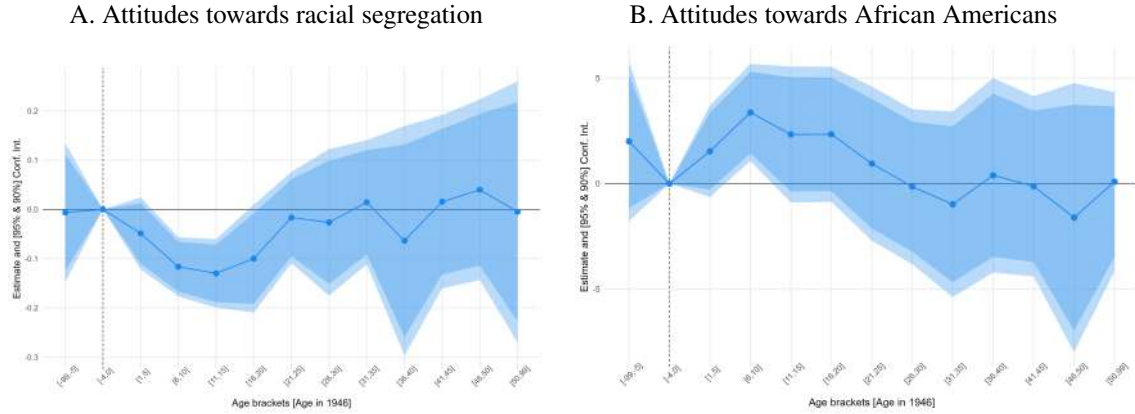


Note. Estimates based on equation (5) including county and state by year fixed effects and year times “maximum conductivity” coverage interaction terms. Dependent variables are 0-1 indicator variables for the absence of KKK branches or the presence of at least one NAACP branch in the county in the corresponding period. In Panel A, the sample is restricted to Southern states. The shaded areas indicates the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance. Presence of KKK and NAACP is built using multiple data sources described in Section 3.3.

E.3 Attitudes and Behavior in the target population

E.3.1 Attitudes

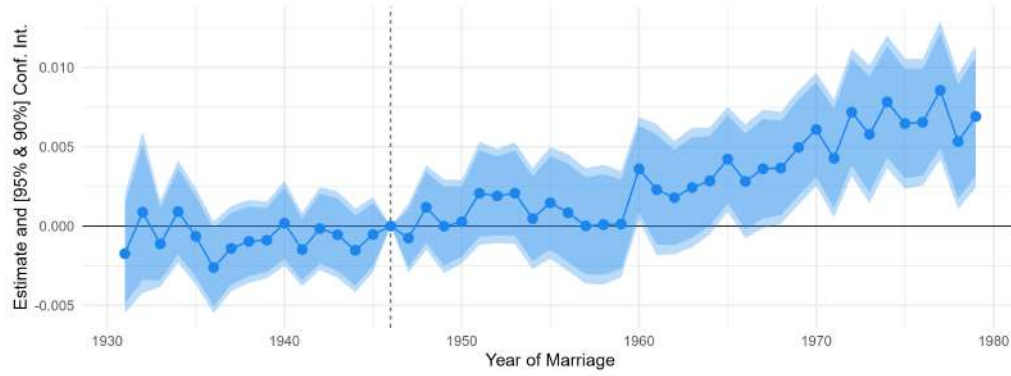
Figure E17: Attitudes towards racism controlling for “maximum conductivity” coverage



Note. Estimates based equation (6) controlling for income, gender, education, age at the time of the interview, survey-wave-, state times year- and county fixed effects. Additionally we include cohort times “maximum conductivity” coverage interaction terms. In Panel A, the dependent variable ranges from 1 to 3 (1 = desegregation, 2 = somewhere in between, 3 = strict segregation). In Panel B, the dependent variable is the reported feeling towards African Americans using a 0-100 scale (0 = negative, 100 = positive). The shaded areas indicates the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance. Further details about the data are reported in Section 3.4.

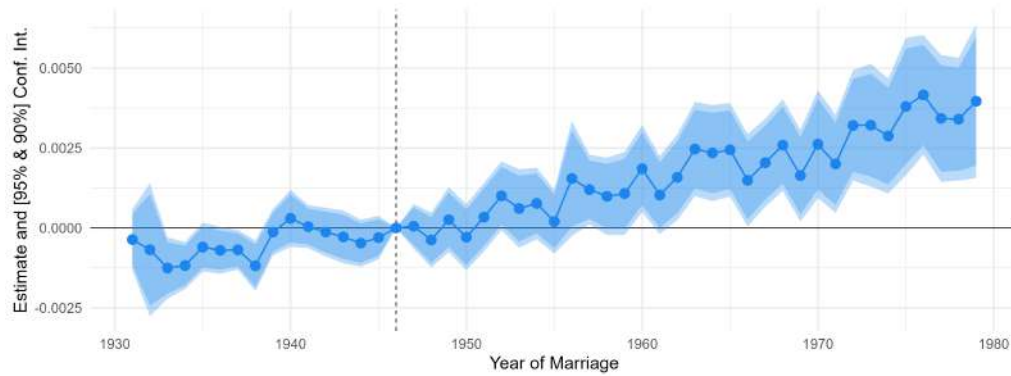
E.3.2 Interracial marriages

Figure E18: The effect on interracial marriage rates controlling for “maximum conductivity” coverage



Note. Estimates based on equation (6), using cohort times “maximum conductivity” coverage interaction terms. The dependent variable is the intermarriage share of the county between 1930 and 1979. The shaded areas indicate the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance. Standard errors are clustered at the county level.

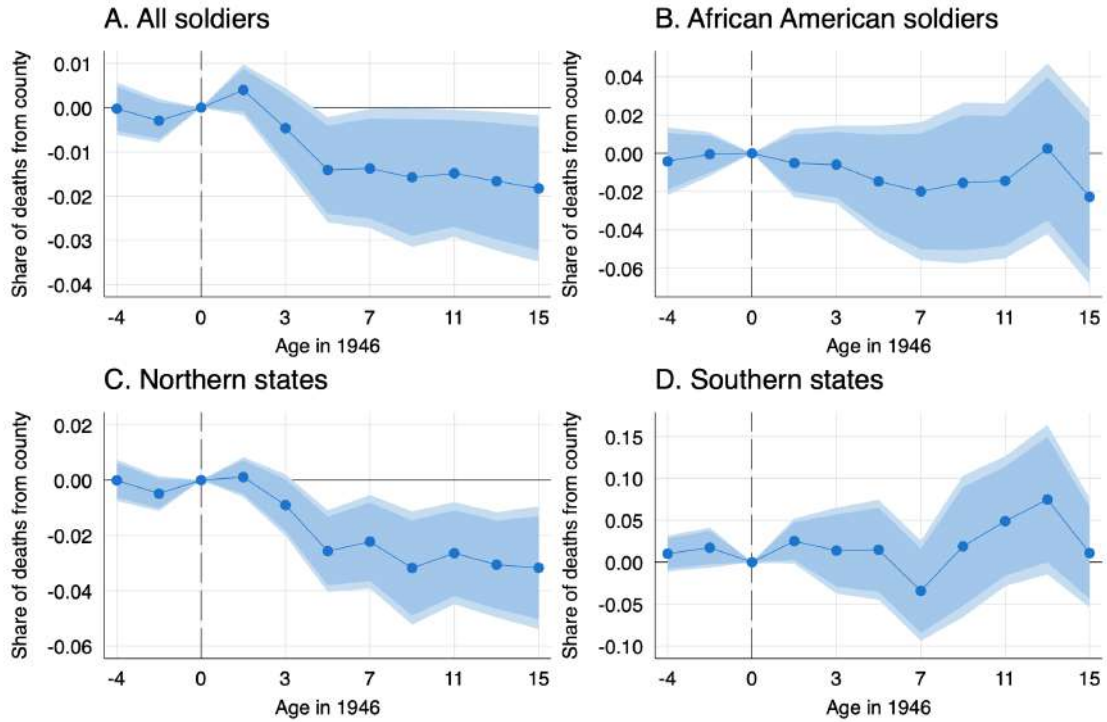
Figure E19: The effect on interracial marriage rates controlling for “maximum conductivity” coverage



Note. Estimates based on equation (6), using cohort times “maximum conductivity” coverage interaction terms. The dependent variable is the intermarriage share of the county between 1930 and 1979. The shaded areas indicate the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance. Standard errors are clustered at the county level.

E.3.3 Vietnam war participation

Figure E20: Effect on the participation in the Vietnam war controlling for “maximum conductivity” coverage

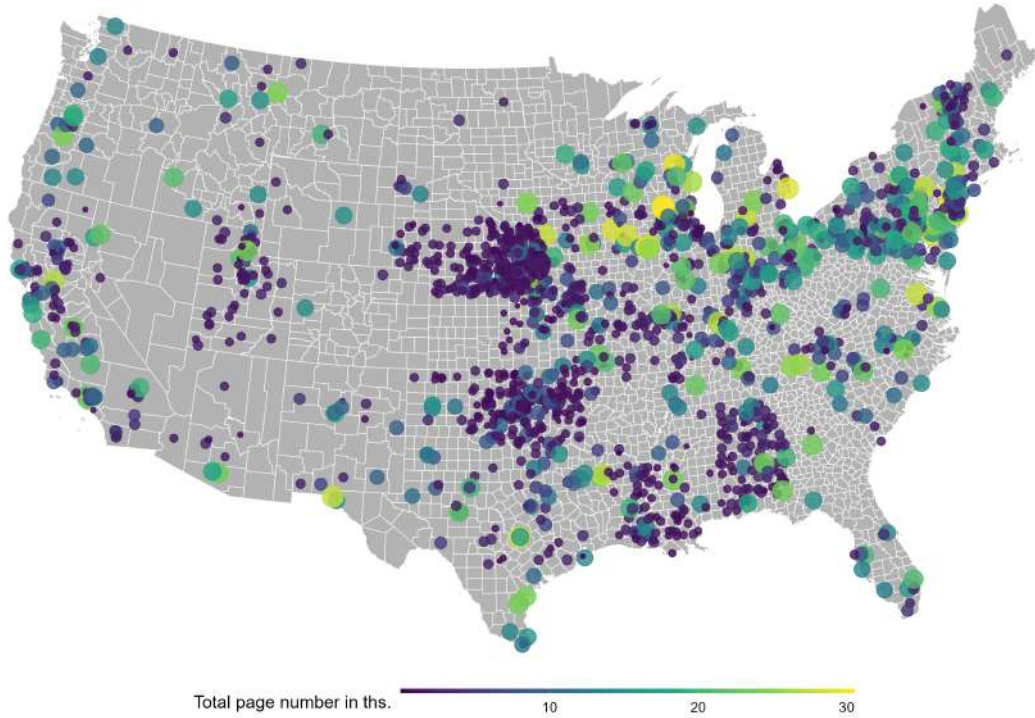


Note. Estimates based on equation (6) using cohort times “maximum conductivity” coverage interaction terms. The dependent variable is the within-cohort share of deaths from a county (multiplied by 100). Panel A includes all soldiers, Panel B restricts the sample to African American soldiers, Panel C restricts the sample to Northern states, and Panel D restricts the sample to Southern State. Southern states include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Virginia, West Virginia and Texas. The shaded areas indicates the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the cohort born when Operation Intolerance was launched. Additional information about the data is provided in Section 3.

F Additional evidence concerning newspapers

F.1 Distribution of local newspapers

Figure F21: Distribution of local newspapers



Note. The figure shows the geographical distribution of local newspapers. Geo-locations are based on the location of their headquarters. The total number of pages is computed in the period January 1945 – December 1947.

F.2 Salience of intolerance

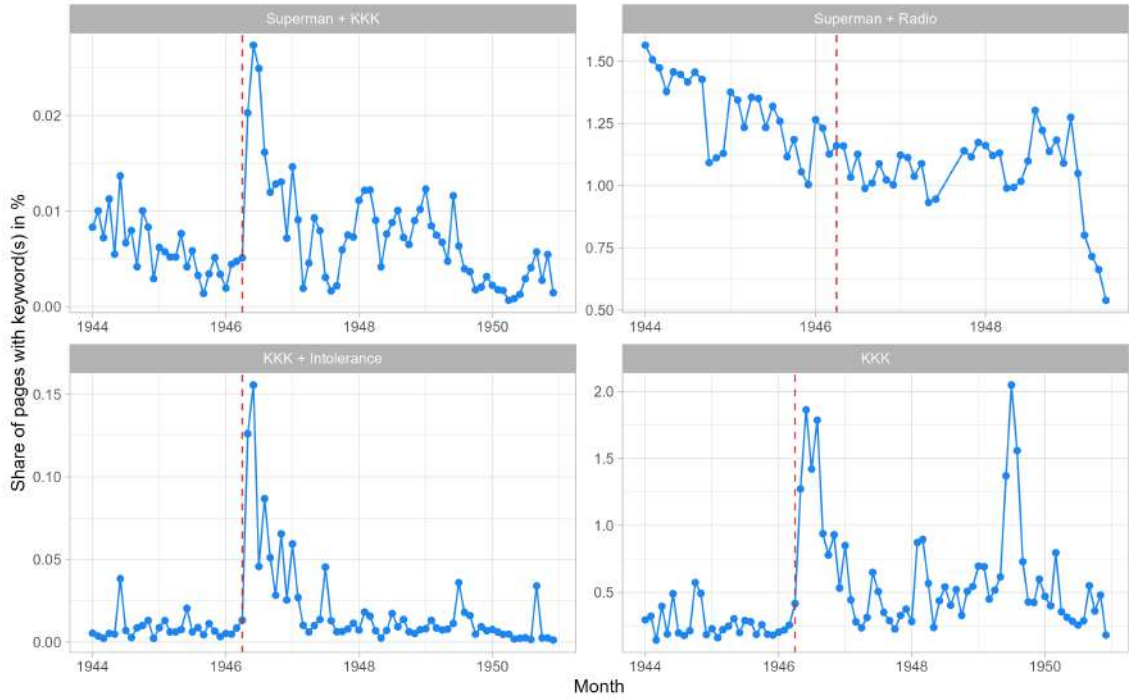
Figure F22 shows a sudden jump in the frequency of KKK references in the newspapers. The increase in reporting about intolerance and bigotry spread by the KKK coincides with a similar jump in salience of “Operation Intolerance” -Superman’s fight against the KKK - in newspapers.

Figure F23 shows a sudden jump in the frequency of KKK references in newspapers at the time the radio show was broadcast. Patterns are relatively consistent across most states.

F.3 Salience of Superman and intolerance for treated and untreated counties

We map newspapers to counties based on the location of their headquarters. For each county-month we create a binary variable taking the value of 1 if we find a reference to the radio show in any of the counties newspapers in the specific month, and 0 otherwise. We consider a county as exposed to the broadcast if at least 10% of the county’s population is covered by a radio signal allowing for high quality reception. Figure F24 that newspapers headquartered in counties exposed to the broadcast are in average 2.13 times more likely to mention the radio show during 1946. This

Figure F22: Salience of Superman and Intolerance in local newspapers

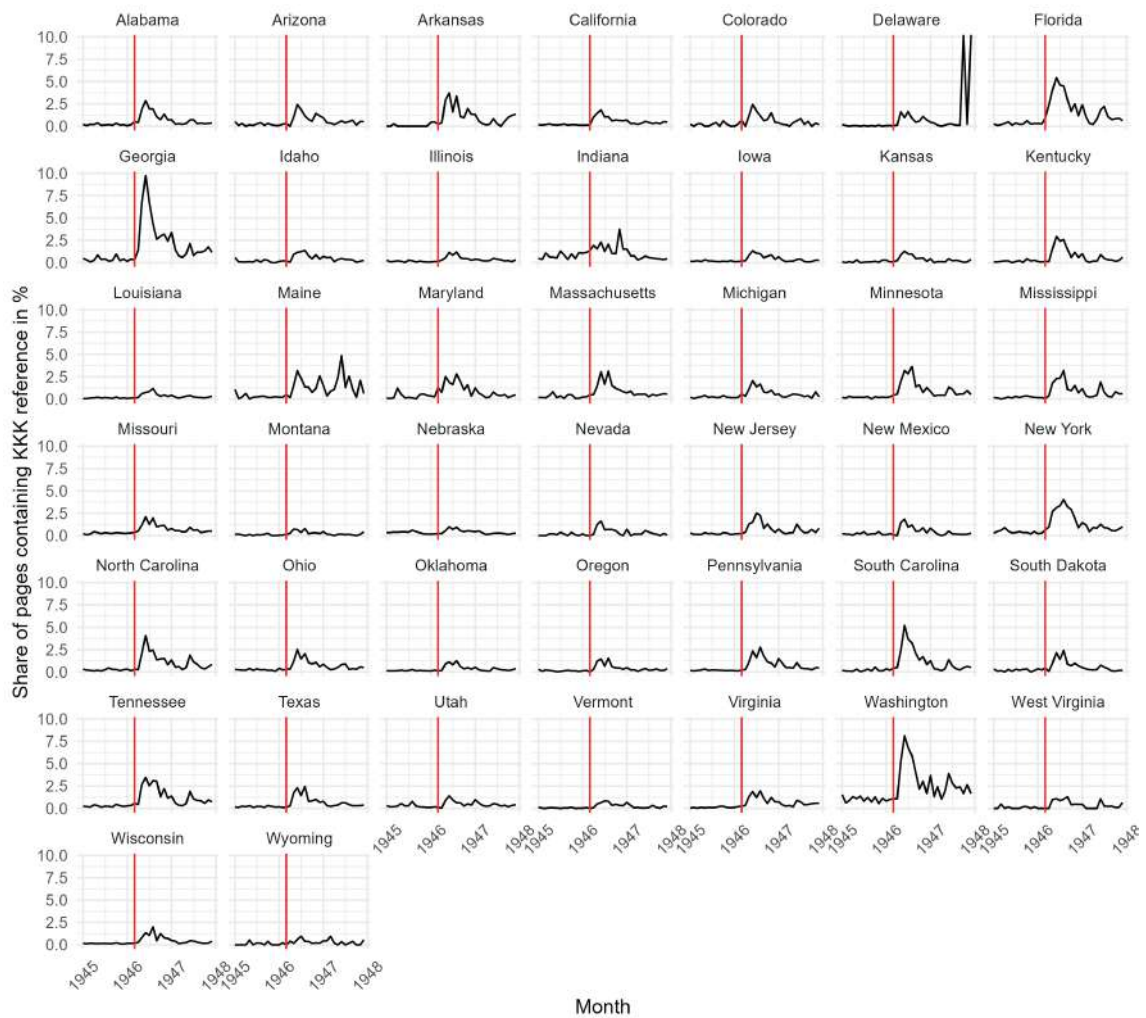


Note. Aggregate salience of topics in newspapers over time as shares of pages with specific keywords of all pages per month. The dashed line marks the start of “Operation Intolerance”. I.e. the top left pane displays the share of pages containing references to Superman *and* KKK, while the bottom left pane displays the salience of articles commenting negatively on KKK.

emphasizes the quality of our collected radio data and lends support to the validity of our spatial matching approach. Hence, we can exploit this local dimension to further investigate radio induced changes in content of local newspapers.

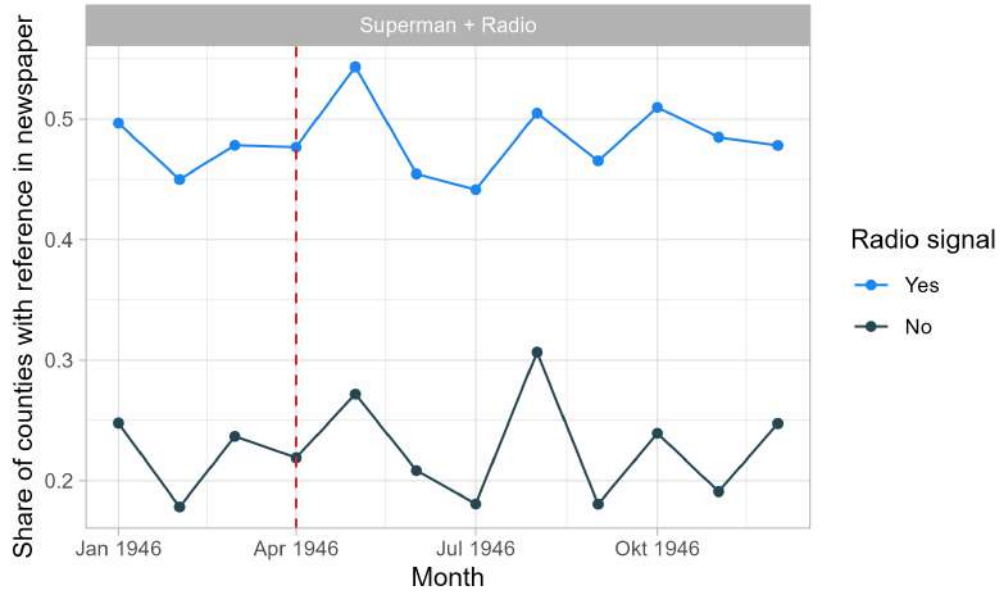
Figure F25 illustrates that this jump was especially pronounced in the states belonging to the “Deep South”, and in counties which have been exposed to the Superman broadcast.

Figure F23: Salience of intolerance in local newspapers, by state



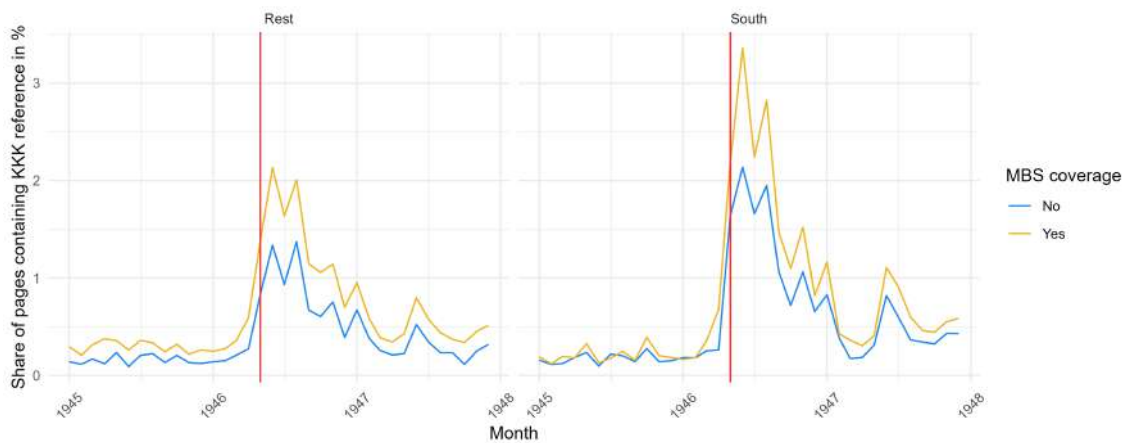
Note. Share of pages containing reference to KKK per month disaggregated by states. The red line marks the start of “Operation Intolerance”.

Figure F24: Salience of *The Adventures of Superman* in local newspapers by treatment status.



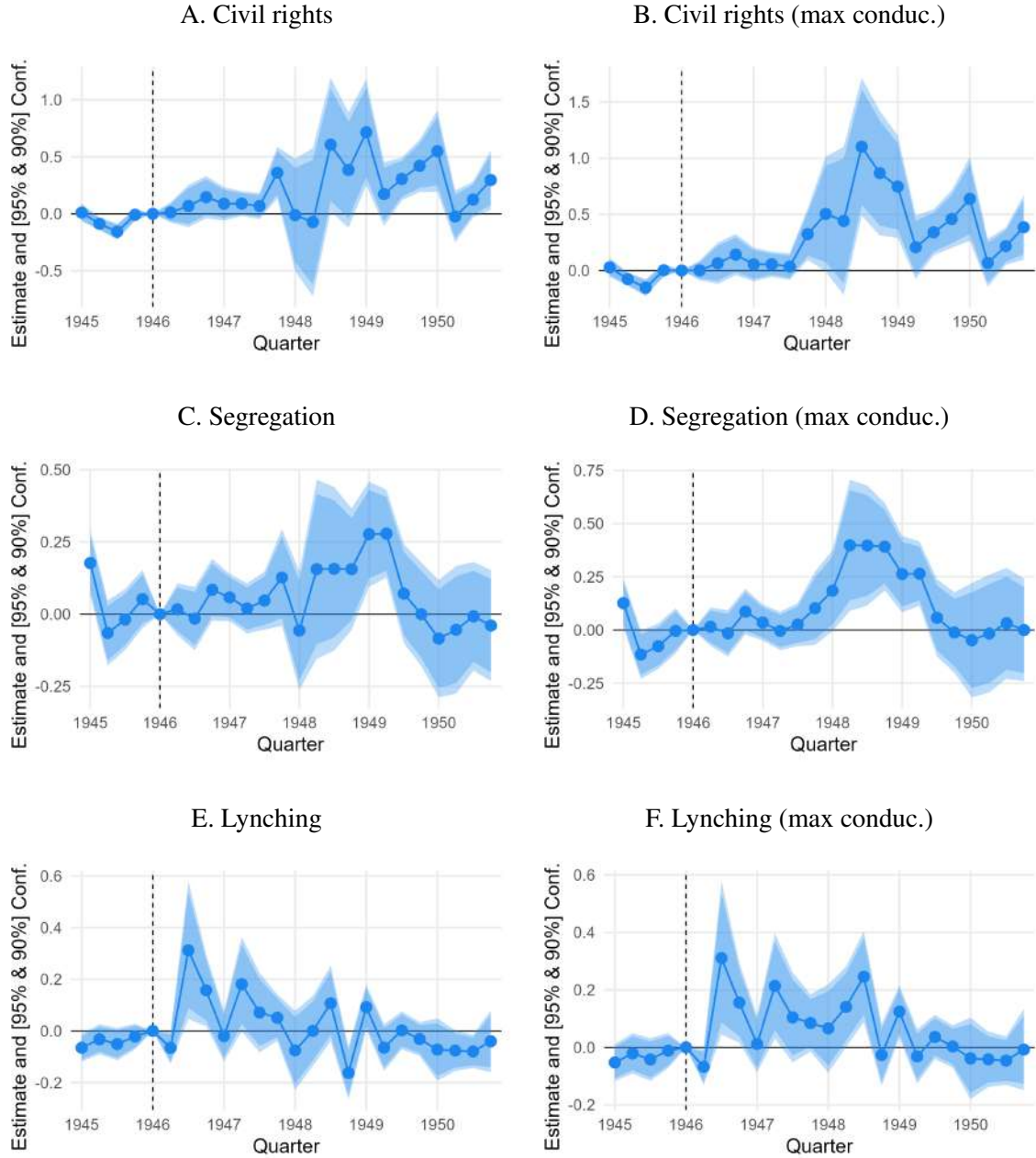
Note. Share of counties with at least one reference to the Superman radio show per month by treatment status. We define a county as treated if at least 10% of the population were covered but a signal of $66dB\mu V/m$ or stronger.

Figure F25: Salience of intolerance in local newspapers by treatment status



Note. Total share of pages containing reference to Ku Klux Klan per month disaggregated by treatment status. We show results separately for the group of states belonging to the “Deep South”. The red line marks the start of “Operation Intolerance”.

F.4 Additional event study results: Salience of civil rights related topics in local newspapers

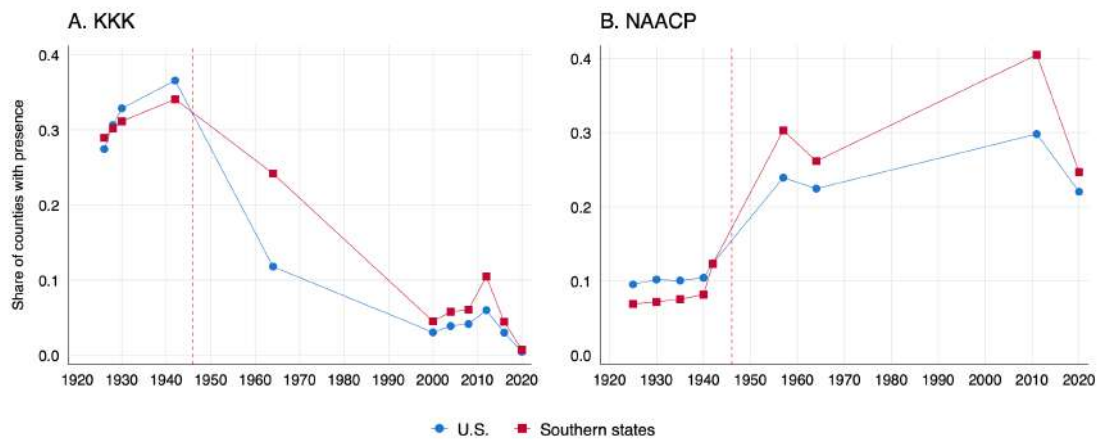


Note. Estimates based on equation (3) using county, quarter and state times year fixed effects. The dependent variable is the quarterly share of pages containing a topic specific references. Panels A, C and E present baseline results. Panels B, D and F include additional, dynamic controls for free field coverage. Details about the measurement are provided in Section 3.2. The vertical line indicates the quarter before the beginning of *Operation Intolerance* as reference period.

G Additional analysis on segregation and social mobilization

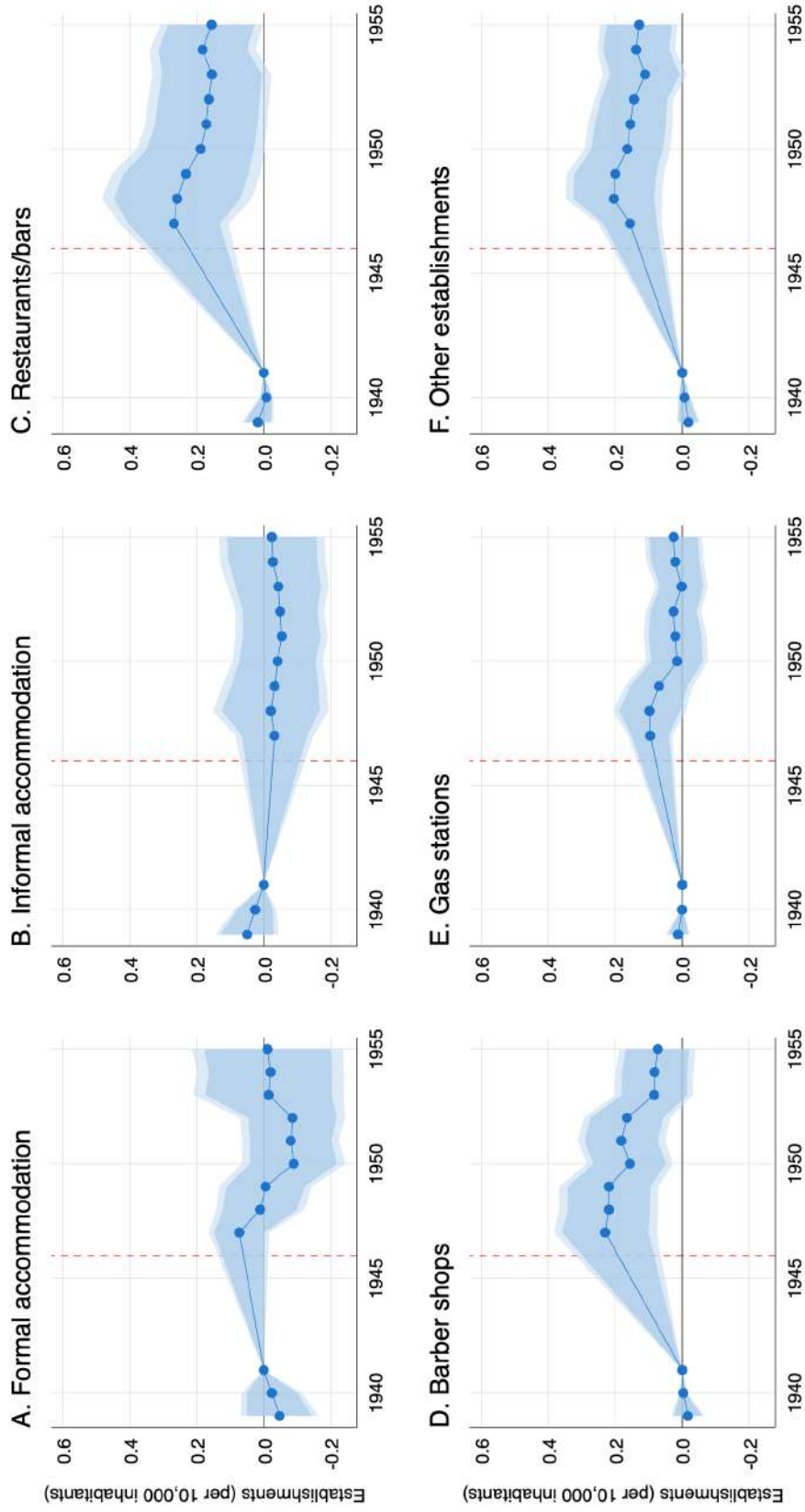
Figure G26 shows the evolution over time of the share of counties in which the KKK (Panel A) or the NAACP (Panel B) are present. Figure G27 show the effect of the broadcast on racial segregation in the provision of services, distinguishing by the type of service.

Figure G26: Presence of KKK and NAACP over time



Note. The figure shows the share of counties in the U.S. and the share in Southern state in which KKK (Panel A) or NAACP (Panel B) are present. Data sources are detailed in Section 3.3.

Figure G27: The effect on racial segregation in the provision of services, by category



Note. Estimates based on equation (3) including county and state by year fixed effects. Dependent variables are the county-level number of establishments with non-discriminatory services to African Americans as included in the Green Books. Data are described in [Cook et al. \(2023\)](#). The number of establishments is normalized by 10,000 inhabitants. We consider different categories of services: formal accommodation (Panel A), informal accommodation (Panel B); restaurants and bars (Panel C), barber shops (Panel D), gas stations (Panel E), and other types of services, such as pharmacies and facilities for entertainment and recreation (Panel F). The shaded areas indicate the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance. Refer to Section 3.3 for further details about data.

H Presidential elections

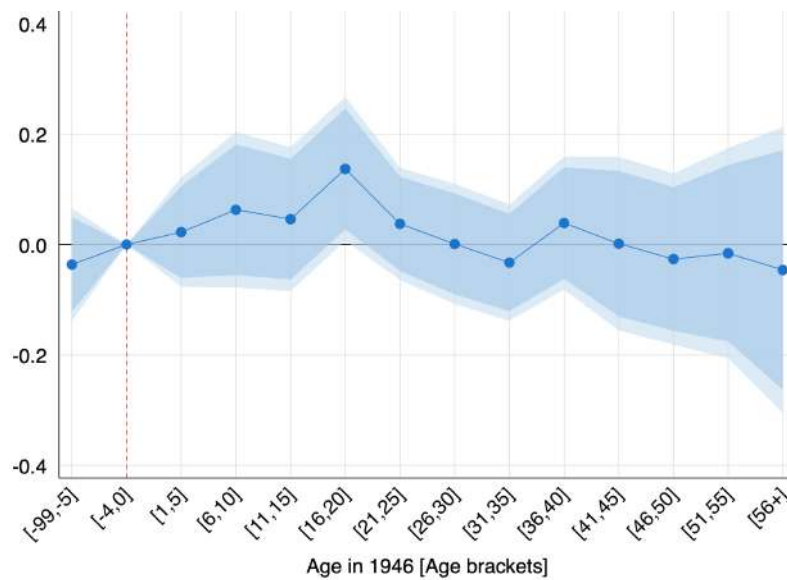
In this section, we analyze how the broadcast of Superman in 1946 impacted presidential elections. We focus on three elections in which the whole generation born after 1946 participated as voters. We summarize the main stance of candidates concerning civil rights here.

First, the *1968 Presidential Election*. This election featured Richard Nixon (Republican), Hubert Humphrey (Democratic), and George Wallace (American Independent Party). Nixon campaigned in favor of law and order without explicitly addressing issues related to civil rights. Humphrey, the lead author of the Civil Rights Act of 1964, had a more progressive agenda on civil rights. Wallace, a strong opponent of desegregation, appealed to white voters who were resistant to civil rights advancements. Second, the *1972 Presidential Election*. This election featured Richard Nixon (Republican) and George McGovern (Democratic). Nixon continued to focus on his law and order agenda, aiming to appeal to conservative voters. McGovern embraced a more progressive stance, supporting civil rights and social justice. Third, the *1976 Presidential Election*. This election featured Jimmy Carter (Democratic), and Gerald Ford (Republican). Carter championed civil rights, by supporting equal rights legislation, and affirmative action policies to address historical injustices. Ford also supported civil rights, but more moderately as compared to Carter.

Overall, during the election between 1968–1976, the position of Democratic candidates on civil rights was more progressive compared to the other candidates. We compute voting using ANES data (Section 3.4). These data record the respondent’s self-reported vote, and for those who report not to have voted, their preferred candidate (if any). We thus define a vote for a Democratic candidate if the respondent reported to have voted for a Democratic candidate or whether the respondent did not vote but had a preference for the Democratic candidate. The sample includes respondents who report not to have voted, and not having any preference; results are not affected by their exclusion.

Figure H28 shows estimates of the effect of the broadcast in 1946 on the Democratic vote in 1968–1976. We observe an increased share of votes for the Democratic candidates in areas covered by the broadcast and among the youngest cohorts in 1946. The effect is significant for the cohort that was 11–15 years old in 1946.

Figure H28: Effect on voting for Democratic candidates in Presidential elections 1968–1976



Note. Estimates based equation (4) controlling for income, gender, education, age at the time of the interview, survey-wave fixed effects, and state \times year fixed effects. The dependent variable is an indicator variable equal to one if the respondent reported to have voted for a Democratic candidate or if the respondent did not vote but had a preference for the Democratic candidate, and 0 otherwise. The shaded areas indicate the confidence intervals at the 10% and 5% confidence levels. The vertical line indicates the beginning of Operation Intolerance. Further details about the data are reported in Section 3.4.