

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

Using Mass Media to Fight Intolerance*

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Abstract

This paper investigates the role of mass media in shaping racial tolerance and advancing civil rights in the post-WWII United States. We study the first attempt in the history of mass media to use a radio broadcast targeted at children to promote an inclusive American society. In 1946, amid persistent racial divisions, the popular radio series *The Adventures of Superman* launched *Operation Intolerance*, a sequence of new episodes promoting equality, rejecting racial discrimination, and exposing the KKK's bigotry. Using digitized historical data on U.S. radio stations and state-of-the-art radio propagation models, we compute geographic exposure to the broadcasts. Exploiting exogenous exposure to the broadcasts, we employ a cohort study design to analyze individual-level data from 1964 to 1980—a crucial period for civil rights activism and legislation in the United States. We find lasting impacts on those exposed as children, including increased support for civil rights, improved interracial relations, and more progressive political attitudes. These effects translate into greater alignment with the Civil Rights Movement, evidenced by increased support for protests and diminished institutional trust, and further manifested by reduced participation in the Vietnam War. Additionally, county-level panel data illustrate how areas covered by the broadcast in 1946 evolve towards less segregationist attitudes, a lower presence of the KKK, and an increase in civil rights activism and prominence in discourse. (*JEL D7, D83, I24, J15, L82, N32*)

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

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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.” Superman (The Adventures of Superman, episode 1370, 1946-09-25)

1 Introduction

The 1940s in the United States were characterized by significant social divisions, particularly along racial lines. In the Southern states, Jim Crow laws institutionalized de jure segregation in public facilities and imposed harsh voting restrictions on African Americans, perpetuating economic, social, and political disenfranchisement. Beyond the South, de facto discrimination persisted as well. Widespread racial animus and post-war uncertainties facilitated the resurgence of hate-based organizations such as the Ku Klux Klan (KKK), which had seen a decline since the late 1920s. These groups opposed civil rights advancements, and had a long history of collusion with local political and law enforcement entities to intimidate African Americans and stifle progressive movements (Fryer Jr and Levitt, 2012; Ang, 2023; Esposito et al., 2023).

Despite the systemic challenges faced by racial minorities, the 1940s marked the onset of a significant shift towards a more racially equal society and the beginning of a period of substantial social change. This transformation was catalyzed by the social changes in the previous decades and the unifying effects of WWII, which fostered the rapid spread of a significant counter-narrative promoting racial equality (Wall, 2009).¹ By the end of the war, white supremacy was no longer a publicly acceptable doctrine in the North, and civil rights for African Americans started to become a national issue, driven by a new consciousness around racism (Kellogg, 1979). This cultural shift laid the foundation for the Civil Rights Movement, the mass protest movement against racial segregation and discrimination that culminated in key civil rights victories, such as the 1964 Civil Rights Act and the 1965 Voting Rights Act (Williams, 2014; Aaronson et al., 2023).

During these transformative times and at a point when radio was the dominant mass medium in the U.S., the producers of the widely celebrated children’s radio program *The Adventures of Superman* embarked on a groundbreaking experiment in 1946. Dubbed *Operation Intolerance*, this initiative marked a sudden

¹Hall (2005) provides a historical and political perspective on this period. The origins of this transformation are primarily rooted in the *Great Migration*, the mass migration of African Americans from the rural South to urban centers in the North beginning in the 1910s. This migration drove economic transformations that gradually pushed society towards the concept of social class rather than race (Bonomi et al., 2021). Additionally, the intellectual and artistic African-American movement of the 1920s, known as the *Harlem Renaissance*, and the discontent of African-American WWII veterans gave rise to the *New Negro*, an outspoken refusal to submit quietly to racial segregation (Gilmore, 2009).

and dramatic shift in the show's thematic content aimed at promoting equality and justice among their young and impressionable audience. New episodes fostered communal harmony among children from diverse racial and ethnic backgrounds, actively countered racial discrimination, and exposed the inherent bigotry of the KKK. The operation was a remarkable success, making *The Adventures of Superman* the highest-rated children's radio program and reaching millions of children every day (Whiteside, 1947).

This paper examines the impact of *Operation Intolerance*, which represented the first attempt in the history of mass media to use a radio broadcast, targeted specifically at millions of children, to promote the narrative of an American society founded on inclusivity. We hypothesize that exposure to the program shifted support for civil rights and racial tolerance, thereby indirectly bolstering the civil rights advocacy efforts that culminated in the legislative changes of the 1960s.² To test this hypothesis, we collect and digitize comprehensive data on all U.S. radio stations active in 1946, including those that aired *The Adventures of Superman*. We then employ state-of-the-art radio propagation models to create detailed maps of AM radio signal coverage. Our main source of variation in the exposure to *Operation Intolerance* relies on the actual exposure to these broadcasts, measured by the share of a county's population that could have listened to the show in 1946, conditional on the share that could have listened if there were no propagation obstacles. In line with the existing literature on the impact of radio broadcasts (Olken, 2009; Enikolopov et al., 2011; Yanagizawa-Drott, 2014; DellaVigna et al., 2014; Adena et al., 2015), this approach allows capturing plausibly exogenous exposure to the broadcast.

We compile a vast array of survey and historical data to study the effect of *Operation Intolerance* on support for civil rights, interracial assimilation, dissent and institutional trust, as well as political attitudes and behavior. We disentangle the effects of the broadcast using a cohort study specification. This involves comparing individuals exposed to the program with those who were not *within specific age cohorts*, exploiting the fact that the target audience comprised children and young adults. Outcome variables span the period from 1964 to 1980, a pivotal time for civil rights in the U.S. This timeframe aligns with when individuals exposed to *Operation Intolerance* as children reached adulthood, allowing us to examine the persistent effects of the broadcast.³ For outcome variables not available at the individual level, we complement this strategy with an event study approach, comparing counties that were covered by the signal in 1946 to those that were not, over a long-term period from 1930 to 2020. These two com-

²Levitt and Dubner (2005) and Bowers (2012) provide anecdotal evidence on Superman's *Operation Intolerance* hindering the KKK's progress in the post-WWII period.

³Our expectations are guided by the social psychology concept known as the *persistence hypothesis* (Torney-Purta, 2017), which highlights the significance of forming values early on. Evidence highlights that adult levels of social tolerance are influenced primarily by both pre-adult and early adult attitudinal environments (Miller and Sears, 1986). See Dhar et al. (2022) for complementary evidence on gender attitudes.

plementary approaches allow us to discern the program's causal impact from the broader trend towards progressive content in radio broadcasts of that era.

We uncover significant positive effects of *Operation Intolerance* on support for civil rights among those who were children in 1946 and lived in areas covered by the radio broadcast. Our Support for Civil Rights Index, a measure that aggregates individual attitudes in favor of civil rights, shows an increase of 0.17 standard deviations in these cohorts, a change comparable to a 25-year generational gap for a child born in the 1940s. These results are robust across the indicators that we used to construct the index, including favorable attitudes towards civil rights leaders and African Americans, and support for racial desegregation and affirmative action for African Americans.

The broadcasts also significantly enhanced racial assimilation. They increased the likelihood of reporting mixed-race friendships by 0.19 standard deviations in the cohort exposed to the broadcast. Interracial marriages, considered the final stage of assimilation (Fryer Jr, 2007; Fouka, 2020), also saw notable increases. In counties fully covered by the broadcast, compared to those that were not exposed, there was an increase of 3.5 interracial marriages per 1,000 marriages. This indicates significant behavioral changes consistent with increased support for civil rights.

To understand how these results relate to the dynamics of civil rights support in the 1960s, and in particular to support for the Civil Rights Movement, we also examine whether the broadcast encouraged dissent and eroded institutional trust. We observe a 0.25 to 0.30 standard deviation increase in support for protests among the targeted cohorts. Within these cohorts, there was a significant decline in favorable views towards the police (0.29 standard deviations) and the military (0.17 standard deviations). These shifts also decreased military participation in the Vietnam War by 0.02 percentage points, one of the most polarizing moments in 20th century American politics and culture. This is notable because the Civil Rights Movement gained momentum as the conflict intensified in the 1960s, with the two becoming closely linked. Objections to the war were closely related to support for the Civil Rights Movement, with many civil rights leaders openly discouraging participation.⁴

Finally, the broadcast influenced political attitudes and mobilization significantly in the decades following WWII. The target cohorts became more progressive and less supportive of the Republican Party, showing changes of 0.27 and -0.18 standard deviations, respectively. In the Deep South, voting data indicate a 4.9 percentage point decrease in support for pro-segregation candidates in counties exposed to

⁴Martin Luther King, Jr and Muhammad Ali were openly opposed to the conflict, while the Black Panther party made exemption from military service for African Americans one of its core demands (Newton, 1980; Lucks, 2014). For further reading about the relationship between the Civil Rights Movement and the Vietnam War, see Harrison (1996).

the broadcast. Additionally, after 1946, counties that received the broadcast experienced a substantial decrease of 7.5 percentage points in the presence of active KKK chapters and an increase of 6.6 percentage points in the presence of the pro-civil rights organization, the National Association for the Advancement of Colored People (NAACP).

In areas that were covered by the broadcast in 1946, these shifts were also accompanied by an overall narrative change toward civil rights in local newspapers. This effect became particularly pronounced during the peak of the Civil Rights Movement in the 1960s, illustrating the profound and lasting impact of the broadcast on social and political landscapes.

Our findings contribute to several different strands of the literature. First, we offer new insights on the profound and lasting impacts of media on societal and political transformations (Strömberg, 2015; DellaVigna and Gentzkow, 2010; DellaVigna and La Ferrara, 2015; Campante et al., 2022). The existing literature often highlights the role of media in fostering intolerance and hatred. For example, the influential 1915 American motion picture *The Birth of a Nation* perpetuated racial discrimination against African Americans (Ang, 2023; Esposito et al., 2023). Similarly, radio has been a powerful medium for promoting exclusionary attitudes, such as antisemitism in the U.S. (Wang, 2021), political support for the Nazi regime in Germany (Adena et al., 2015), ethnic hostility in Croatia (DellaVigna et al., 2014), and even genocide in Rwanda (Yanagizawa-Drott, 2014). In contrast, we uncover evidence demonstrating that mass media can also be a force for positive change, specifically in promoting racial equality and civil rights. By examining the long-term effects of *Operation Intolerance*, our research shows how targeted media campaigns can shape public perceptions and attitudes towards more inclusive societal norms. To our knowledge, our study is among the first to explore the long-term positive effects of mass media on racial equality, highlighting a shift in narrative that significantly contributed to the advancement of civil rights.⁵

Second, we contribute to the literature on racial prejudice, which extensively documents the pervasive negative impacts across various settings, including human capital accumulation (Billings et al., 2014; Alsan and Wanamaker, 2018; Bor et al., 2018; Eli et al., 2023), access to housing and services (Logan and Parman, 2017; Bayer et al., 2018; Cook et al., 2023), labor market outcomes (Bayer and Charles, 2018), and the use of police violence (Knox et al., 2020; Ang, 2021). Despite such an extensive literature, devising effective anti-prejudice policies remains an elusive quest (Bertrand and Duflo, 2017).

⁵In complementary research, Armand et al. (2020) and Gagliarducci et al. (2020) document the role of radio broadcasts for the demobilization of rebel fighters in central Africa and for the mobilization of Resistance fighters in Italy during WWII, respectively.

Available evidence is derived from experimental approaches that increase inter-group contact (Boisjoly et al., 2006; Rao, 2019; Mousa, 2020; Bursztyn et al., 2021; Lowe, 2021; Corno et al., 2022) and lab-in-the-field-based interventions (Paluck and Green, 2009; Blouin and Mukand, 2019), neither of which are easily scalable.⁶ Our study presents a real-world example of how a deliberate at-scale radio intervention targeting millions of children can have persistent positive impacts on societal attitudes towards racial tolerance. In particular, thanks to the design of *Operation Intolerance*, we are able to estimate the effects of a sudden change in the content of an existing program, thereby isolating the impact of narrative change from the overall influence of the program. With this approach, we indirectly provide a novel contribution to the literature on *edutainment* programs, where impacts are generally by-product of audience demand for amusement rather than targeted interventions (DellaVigna and La Ferrara, 2015).⁷

Finally, by providing new evidence on the emergence of a culture of tolerance at the end of the 1940s and its role in shaping support for the Civil Rights Movement in the 1960s, we contribute to the burgeoning literature on the interplay between culture and institutions (Alesina and Giuliano, 2015; Bisin and Verdier, 2024). Existing research has highlighted the deep cultural roots of intolerance, for example, the medieval origins of anti-Semitism in Nazi Germany (Voigtländer and Voth, 2012), and the influence of Confederate institutions in promoting racial animus in post-Civil War U.S. (Bazzi et al., 2023b). Recent studies, such as those by Dippel and Heblisch (2021) and Ang and Chinoy (2024), illustrate how politically active groups shaped anti-slavery efforts and civil rights activism, respectively. Furthermore, Calderon et al. (2023) and Bazzi et al. (2023a) examine how internal migration influenced progressive and conservative values in the 1960s. Our findings introduce a novel mechanism: early exposure to media content promoting racial tolerance significantly impacts societal attitudes by stimulating dissent, institutional distrust, and progressive attitudes. This adds a new dimension to our understanding of the origins and evolution of social movements (Madestam et al., 2013; Cantoni et al., 2024), highlighting the significant role of early cultural interventions in shaping public discourse and actions.

⁶Large scale interventions fostering inter-group contact are scarce in the literature. Bazzi et al. (2019), who study a resettlement program in Indonesia in the 1980s, is a rare exception.

⁷Estimating the effects of *The Adventures of Superman* is beyond the scope of this paper. Evidence on *edutainment* programs has documented impacts on educational outcomes (Gentzkow and Shapiro, 2008; Kearney and Levine, 2019), gender norms (Chong and Ferrara, 2009; Jensen and Oster, 2009), fertility decisions (La Ferrara et al., 2012; Kearney and Levine, 2015), and voting behavior (Durante et al., 2019).

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 U.S., exerting significant cultural influence across 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 radio receivers grew from 68% to 96% during the 1940s, marking the peak of the “Golden Age” of radio in terms of both its reach and societal impact ([Craig, 2004](#)).

In this context, the radio program *The Adventures of Superman*, featuring the DC Comics character Superman, began airing in 1940 on just 10 regional radio stations ([De Haven, 2010](#)). Following initial success, from August 31, 1942, to February 4, 1949, it was exclusively broadcast on the national syndicated network Mutual Broadcasting System (MBS). In the 1940s, MBS was one of the four main commercial radio networks operating. It had been active since 1934 and had achieved success by specializing in recorded transcription series ([Ackerman, 1945](#)). *The Adventures of Superman* targeted children and young adults, broadcasting in an after-school afternoon slot as a 15-minute serial airing three to five times per week. Individual story arcs ranged from 15 minutes to over three hours of broadcast time. Their content differed from the comic book series and was specifically designed for the radio series with its own writers room producing the scripts ([Daniels, 1998](#)). During the 1940s, the show consistently featured amongst the most popular entertainment formats of youth radio programming, regularly drawing millions of young listeners ([Hooper Inc., 1949](#)). In February 1949, the show moved to the competing ABC network, and was discontinued in 1951 after airing 2,088 original episodes.

The year 1946 represented a unique experiment in the history of radio broadcasting. Amid the resurgence of racial tensions following the end of World War II, in October 1945, the producers of *The Adventures of Superman* started working on scripts that would pitch Superman on “crusades against intolerance... in terms which children could understand” ([Wall, 2009](#)). The objective was two-fold: advocate among young listeners for a united American society that embraces individuals irrespective of their creeds or racial origins, while guaranteeing the commercial interests of the serial’s sponsor (Kellogg Company).⁸ In just a few months, the new episodes were ready to go on air, and on April 15, 1946, MBS started broadcasting *Operation Intolerance*, a series of new episodes intentionally crafted to impact the social values of children who were listening.⁹

⁸In current terminology, the sponsorship of the Kellogg Company would be akin to corporate social responsibility. Kellogg Company was the exclusive sponsor of the series throughout the MBS period ([De Haven, 2010](#)).

⁹The term “Operation Intolerance” does not appear in internal documents of the program. We adopt this term from the media of that time (Appendix B).

This unexpected shift in the program was an unprecedented and progressive departure from the dominant traditional narratives of popular media of those years. The cultural construction of Superman as a moral and brave defender of Earth dressed in the colours of the nation's flag followed with war-time culture (Freeman, 2015). Before 1946, the content of the series primarily reflected this feature, mixing patriotism with the concept of righteous triumph over evil enemies (Finney, 2011). Along these lines, the first years of the series are “years of pure blood, thunder and atomic energy” (Daniels, 1998), with Superman fighting mad scientists, atomic weapons and supernatural menaces. With *Operation Intolerance*, Superman started fighting bigots in the American social landscape, making the enemy real and familiar to the audience (Klein, 1946). This approach carries a clear political statement and joined a cultural shift towards a more inclusive society that had spread in the early 1940s. Promoting a message of tolerance, in particular of racial equality, on mass media series was unprecedented at that time, to the point that both the producers and the sponsor considered it as an experiment (Appendix Figure B7).

The first sequence of episodes, *The Hate Mongers' Organisation*, centered around the attempt of an exemplary white supremacist group to prevent the creation of the Unity House community center, a place “where children of every race, ethnic background, and spiritual belief can play and interact to learn that all people are the same” (*The Adventures of Superman*, episodes 1254–1278). With Superman’s assistance the hate mongers are defeated, allowing the establishment of Unity House to proceed. In a period in which racial segregation was widespread across many states, the story arc was a potent political statement in favor of equality.

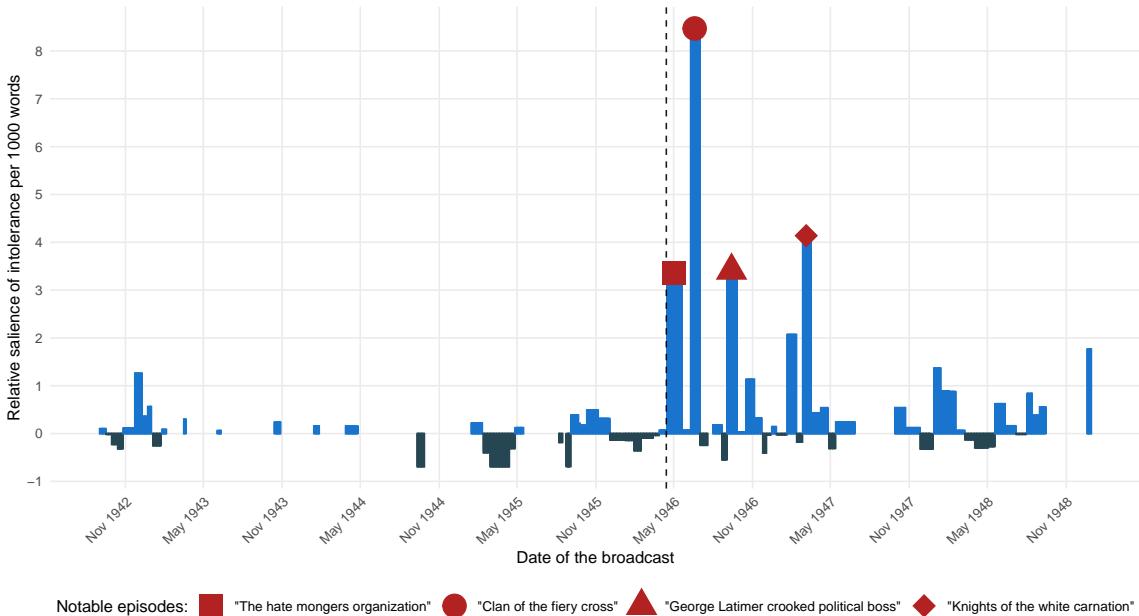
Following the positive reception of the first sequence of episodes, the creators collaborated with Stetson Kennedy, a human rights activist who had helped infiltrate the KKK in the mid-1940s, to produce a story arc pointedly confronting the KKK and its ideology. Over two weeks in June 1946, MBS broadcast a series of episodes titled *The Clan of the Fiery Cross*, in which Superman directly battled “the Klan.” Using the information collected by Kennedy, the plot derisively exposed the KKK’s rituals, code words, and bigotry to its audience.

Other illustrations of Superman addressing real-world issues occur in the story arcs titled *George Latimer*, *Crooked Political Boss*, broadcast in August–September 1946, and *Knights of the White Carnation*, broadcast in February–March 1947. In the former, Superman thwarted attempts by the antagonist George Latimer to implement discriminatory hiring practices for veterans, insisting only native-born, white, Protestants be considered. This story line resonated with concerns surrounding WWII veteran reintegration and was praised by the American Veterans Committee (Goodrum, 2008). In the latter, Superman

directly fights against the racist agenda of a secret organization, who plots to eliminate foreigners from the Metropolis High School Varsity Basketball Team. Appendix B.1 provides detailed summaries of the plots with the highest share of content related to tolerance and intolerance during *Operation Intolerance*.

Content analysis of the story scripts highlights the magnitude of *Operation Intolerance*. Figure 1 reveals that the proportion of words related to intolerance increased by 3.2 times in the 12 months following the start of *Operation Intolerance*, compared to the pre-intervention period. For the four most notable episodes, highlighted in red, this increase jumps to 7.7 times. While focusing solely on the salience of keywords may underestimate the actual share of content attributed to intolerance, this figure highlights the clear shift in narrative to which the show's young listeners were exposed.¹⁰ Although the intense focus on such narrative began to fade after one year, the series broadcast a total of 65.25 hours in the year following the launch of *Operation Intolerance*, including 18 hours dedicated to the four main story arcs. This extensive coverage, together with the number and the loyalty of listeners, made the overall scale of the intervention unique in the literature.

Figure 1: The change in narrative in *The Adventures of Superman*



Note. For each episode transcript in *The Adventures of Superman*, the figure illustrates the share of keywords (per 1,000 words) related to tolerance or intolerance. The series is centered around the average share in the period preceding *Operation Intolerance*. We consider all broadcasts on the MBS network from August 1942 to February 1949. The full methodology is described in Appendix B.2. Each bin in the figure represents a story arc, the broadcast of which may span multiple weeks. The width of the bin represents the duration of the story arc. Appendix B.1 provides detailed summaries of the plots of story arcs with the highest shares.

¹⁰ Appendix B.2 describes the methodology to compute this measure. The analysis is based on a bag-of-words approach using a list of 50 keywords to quantify the share of content addressing intolerance and tolerance towards racial, ethnic, and religious differences applied to the transcripts from 1,019 episodes broadcast on MBS between 1942 and 1949.

Operation Intolerance was a huge success. The new format of the show succeeded to attract 4.5 million listeners from its target demographic, making it the highest rated youth program on the air ([Hooper Inc., 1949](#)).¹¹ Appendix B.3 provides historical evidence from newspapers about the positive reception of the series by public opinion. Among these, former Vice President Henry A. Wallace, endorsed in an official statement 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” ([Janesville Daily Gazette, 1946](#)). Similar endorsements emanated from President Harry S. Truman, and various religious and civil rights organizations (see, for instance, [The Pittsburgh Press, 1946](#)).

3 Data

We combine a wide variety of data, ranging from surveys to historical and archival data, including the geographical processing of historical radio coverage. This section describes the data sources used in the paper. Section 3.1 describes how we build exposure to *Operation Intolerance*. Section 3.2 provides a description of data on attitudes related to support for civil rights, dissent and institutional trust, and political attitudes. Section 3.3 describes data about racial assimilation. Section 3.4 discusses data about participation in the Vietnam War. Section 3.5 describes data about salience of topics from local newspapers. Finally, Section 3.6 describes data on voting and mobilization.

3.1 Exposure to *Operation Intolerance*

We digitize data from the Radio Annual 1946 yearbook ([Radio Daily, 1946](#)) to construct a comprehensive database on the universe of U.S. radio networks operational in 1946. Radio Annual serves 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 the location of transmitters. The entire digitized network consists of 986 individual antennas broadcasting radio programs on different frequencies. We complement our database with information on broadcasting

¹¹The only available source on the number of listeners post *Operation Intolerance* comes from [Whiteside \(1947\)](#), based on the March–April 1947 Hooper Ratings—a radio audience measurement system that covered a sample of 14 cities. Using census data from the 1940 and 1950 and the coverage of *Operation Intolerance* discussed in Section 3.1, we assume a (uniform) radio penetration of 85% (see, for instance, [US Bureau of the Census, 1975](#)), and we estimate that the show could have been listened directly by 3.1 million children aged 3–6 years (37% of the total population in this age group), 5.6 million children aged 7–13 years (35%), and 2.1 million children aged 14–17 years (34.6%). An audience of 4.5 million listeners corresponds to roughly 42% of children in the age group 3–17.

schedules and network affiliations derived from the advertising records published in two other publications containing media rates and data for advertisers: the 1947 Yearbook Number of the Broadcasting magazine ([Broadcasting, 1947](#)), and the 1945 Standard Rate and Data Service (SRDS) media buying publication ([The National Authority, 1945](#)). Using these sources, we identify when and which radio stations broadcast *The Adventures of Superman* in 1946. Appendix Section A contains further explanation of the methodology and extracts of the original data sources. Appendix Figure A4 provides the geographical distribution 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 had been very influential in the U.S. since the 1920s, and in 1940 and 1950, they represented 99.6% and 74% of radio stations, respectively ([US Bureau of the Census, 1975](#); [Strömberg, 2004](#)). Although the Frequency Modulation (FM) network expanded rapidly, 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](#)).

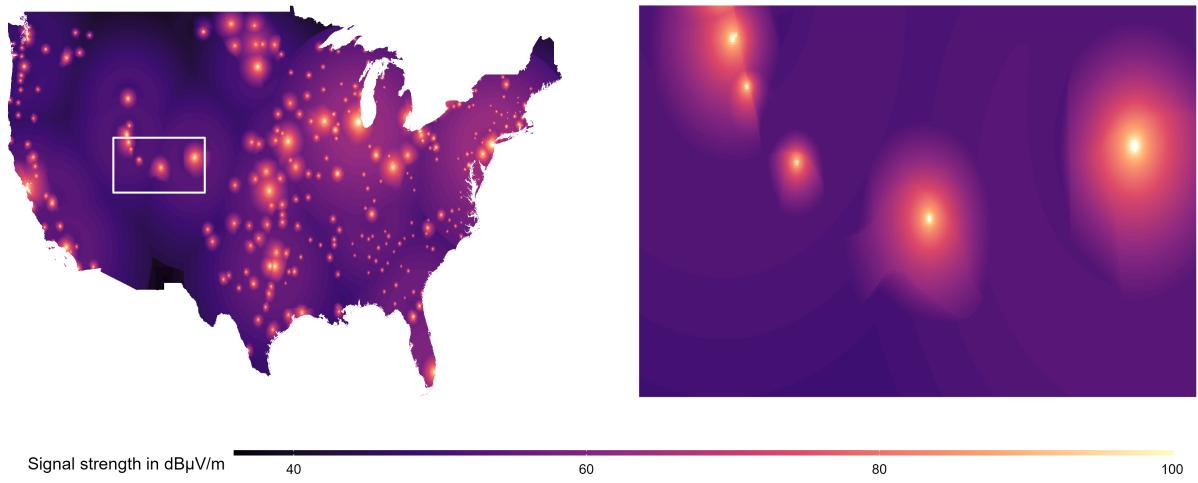
AM signal propagation has two main components: a ground wave and a sky wave. The ground wave's propagation depends not only on topography but also on soil conductivity—the ability of the soil to conduct electromagnetic waves, which depends on moisture, soil composition, and mineral content. The sky wave primarily depends on ionospheric refraction—the bending of radio waves by the ionosphere layer of the Earth's atmosphere—and is influenced by the degree of solar radiation. Unlike FM transmission, which depends on line-of-sight propagation, the propagation of signals at lower frequencies, typically used for AM, is much less affected by physical obstacles. AM transmissions can pass through buildings, foliage, and other obstructions, and bend over hills and other obstacles, enabling radio waves to travel beyond the horizon and follow the contour of the Earth (see, e.g., [Reed and Sander, 1987](#)). Consequently, radio coverage models that focus solely on topographic corrections, such as the Longley-Rice/Irregular Terrain Model (ITM), are not accurate predictors of AM radio 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 that broadcast *The Adventures of Superman* in that year. 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.¹² For each station, the algo-

¹²The algorithm accounts for both the ground and the sky wave of the AM transmission. We collaborated with [ATDI](#), a global leader in radio engineering, to ensure accuracy in coverage calculations.

rithm produced a raster covering the continental U.S. at a resolution of 400 meters. We overlay the signal strength of each station to create a coverage map of *Operation Intolerance*, which we depict in Figure 3. It is worth noting that accurate AM propagation models became feasible only in 1958 (Bremmer, 1958), more than a decade after the launch of *Operation Intolerance*. Prior to that, radio operators had an incomplete understanding of potential signal coverage when setting up their antennas.

Figure 2: Signal strength of *The Adventures of Superman* in 1946



Note. The left panel shows the geographical distribution of the signal strength of the *Superman* broadcast at a resolution of 400m^2 . Signal strength is reported in $\text{dB}\mu\text{V}/\text{m}$, with higher values indicating stronger signals. The figure is generated by overlaying the signal from each individual antenna. In areas covered by multiple antennas, we select the strongest signal at each point, assuming listeners would tune into the station with the strongest reception. The right panel zooms into a specific portion of the U.S., indicated by the rectangle in the left panel. Details about the geo-location of antennas and the computation of signal strength are described in Section 3.1.

3.2 Attitudes and behavior in the target population

We gather data about attitudes for the U.S. population directly targeted by the broadcast in 1946 from the American National Election Studies (ANES, 2021). ANES is a nationally-representative survey of the voting-age population 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 all survey waves collected in the period 1964–1980, a period characterized by high salience of civil rights in American politics. Though major events are concentrated in the initial part of the period, such as the enactment of the Civil Rights and the Voting Rights Acts in 1964 and 1965, and the assassination of Martin Luther King, Jr. in 1968, the relevance of civil rights in the public sphere remained high throughout the period. For instance, the 1978 Supreme Court decision in *Regents of the University of California v. Bakke* declared unconstitutional the use of racial quotas in higher education. In line,

the 1964–1980 survey waves are also those in which a variety of questions related to racial tolerance and civil rights are consistently collected in multiple (consecutive) survey rounds (see Appendix C.1). It therefore enables us to draw on a wide array of consistently covered survey items to track attitudes related to civil rights, while previous and following periods do not have the same wealth of information covering these topics.

We merge responses from the ANES surveys with data on exposure to *Operation Intolerance* using the year of birth and the county of residence of each respondent. To accurately measure exposure to the broadcast during childhood, we restrict our analysis to individuals residing in the same state where they grew up, and assign the county of residence in the survey year as the county of residence during childhood. [Kearney and Levine \(2019\)](#) provide empirical evidence supporting this approach to account for potential migration.¹³

We focus on three sets of attitudes that relate to the rise of civil rights in the U.S. Appendix C.1 provides the exact definition of each variable, the data availability across survey waves, and descriptive statistics by cohort and survey wave. For cross question comparability, in the tables, all attitude questions are standardized into z-scores. In addition, all variables are reported in such a way that higher values indicate pro-civil rights attitudes or alignment with the Civil Rights Movement.

First, because *Operation Intolerance* directly spreads a message of racial tolerance, we examine **attitudes in support of civil rights**. We identify nine questions across multiple survey rounds that capture this dimension.¹⁴ The first four questions assess favorable feelings towards civil rights leaders and Black Americans, and unfavorable feelings towards Southerners, and the well-known segregationist George Wallace.¹⁵ Favorable feelings towards a person or a group are gauged using the ANES *Feeling Thermometer*, a widely used method for collecting attitudinal data (see, for instance, [Tyler and Iyengar, 2023](#)). It uses a scale ranging from 0 to 100, where 100 indicates very warm (favorable) feelings and 0 indicates very cold (unfavorable) feelings. We measure unfavorable feelings by the *Inverted Feeling Thermometer*, which inverts the standard survey scale. On average, respondents are less favorable towards civil rights leaders compared to the Black population in general, with average Feeling Thermometer scores of 44.7 (standard deviation 26.6) versus 62.8 (standard deviation 21.1), respectively. In addition, they are di-

¹³In Appendix D.3, we replicate our main results in the sample of migrants. We do not observe any effect in this sample, highlighting the importance of selecting non-migrants.

¹⁴Appendix D.2 provides their partial correlations.

¹⁵George C. Wallace Jr served as governor of Alabama for four terms between 1963 and 1987, and ran as Presidential candidate in 1968. He openly supported racial segregation, especially in the first part of his career (“segregation now, segregation tomorrow, segregation forever” is a popular quote from his 1963 inaugural speech; [The New York Times, 1963](#)). At the time of the survey, the term *Southerner* referred not only to people residing in the southern states, but also to the fact that major resistance to the promotion of civil rights was in the southern states ([Bartley and Graham, 2019](#)).

vided regarding George Wallace, with an average Inverted Feeling Thermometer score of 52.6 (standard deviation 28.5), while attitudes towards Southerners are not strongly negative, evidenced by an average Inverted Feeling Thermometer score of 33.8 (standard deviation 20.1).

The remaining five questions capture attitudes in support of affirmative action for the Black population, integrated schools, Black representation, desegregation, and speeding up civil rights legislation. Respondents are on average supportive of affirmative action, with an average score of 3.61 (standard deviation 1.89), ranging from 1 (no action) to 7 (the Government should help). They are divided on whether African American are appropriately represented in society and in politics, with an average score of 1.98 (standard deviation 0.79), ranging from 1 (too much) to 3 (too little). On average, they tend to support policies to end racial segregation: 45% of respondents (standard deviation 0.50) support integrated schools, 86% (standard deviation 0.50) are in favor of desegregation, and 47% (standard deviation 0.50) support speeding up the civil rights legislation.

The second set of attitudes concerns **dissent and institutional trust** and aims at capturing alignment with the Civil Rights Movement as a mass protests movement. The first 2 questions capture whether the respondent approves of participation in protests and in demonstrations. Protests includes “protest meetings or marches that are permitted by the local authorities”, while demonstrations are attempts at stopping the government from going about its activities with “sit-ins, mass meetings, demonstrations” ([ANES, 2021](#)). The latter three questions concern institutional trust, capturing whether the respondent trusts the Federal Government, a major source of changes toward equality, and favorable feelings towards the police and the military. On average, approval of protests and demonstrations is low, with a sample average of 1.72 (standard deviation 0.71) and 1.55 (standard deviation 0.62) out of 3, respectively, with 1 indicating approval and 3 disapproval. Respondents have favorable feelings towards the police and the military, with an average Feeling Thermometer score of 76.3 (standard deviation 18.4) and 71.1 (standard deviation 18.4). Respondents are divided in terms of trust, with an average score of 2.52 (standard deviation 0.63), ranging from 1 (never trust the Federal Government) to 4 (always trust).

Finally, we focus on **political attitudes**. We measure whether the respondent reports being progressive, measured using ANES’s Conservative–Liberal Scale, and the favorable/unfavorable feelings towards the Republicans, which held the more conservative position in the period from 1964 to 1980. Respondents are divided between conservative and liberal values, with an average Conservative–Liberal Scale of 52.8 (standard deviation of 14.5) out 100, with 100 indicating the highest degree of liberal values. At the same time, they tend to have slightly less favorable feelings towards Republicans, with an average Inverted

Feeling Thermometer score of 60.6 (standard deviation of 20.7).

3.3 Racial assimilation

We measure individuals' degree of racial assimilation using two alternative data sources. First, using the ANES data presented in Section 3.2, we build a measure of assimilation by focusing on whether respondents report having a mixed composition of friends or whether all friends are from the same race. This measure, being self-reported, captures both actual behavior and attitudes toward racial integration in society.

We complement individual-level information with aggregate level measures of interracial marriages. Marital decisions are a strong and robust measure of actual behavioral change, and a powerful measure of cultural assimilation. We exploit census data from [Ruggles et al. \(2024\)](#), leveraging 5% of the sample from the 1980 U.S. Census. As the 1980 Census does not disclose counties below 100,000 inhabitants, we focus on the Principal Statistical Units (PSU) as the unit of aggregation. From a total of 11,274,348 individuals in the continental U.S., we consider 4,699,099 married individuals living in 1148 PSUs. For each PSU, we calculate the share of individuals in interracial marriages by year of marriage. The aggregate share of interracial marriages is equal to 1.65%, with 58.79% of these being marriages between White and Black individuals.

3.4 Vietnam War participation

The U.S. government's deep involvement in the Vietnam War (1955–1975) 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, 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.

To capture this indirect dimension of dissent, we gather information on participation in the Vietnam War. Because individual level information on origin and deployment is not publicly available, we use casualties as a proxy for participation. In line with [Esposito et al. \(2023\)](#), who use casualties during World War I as a measure of participation, this approach assumes that among those mobilized, being

wounded or dying (versus not) was largely random. Notably, participation in the Vietnam War was primarily characterized by volunteers (Davidson, 1988).¹⁶

To compute casualties, we obtain data about the casualty date and the hometown of each individual from the *Defense Casualty Analysis System (DCAS)* database (U.S. Department of Defense, 2006). We gather records documenting the deaths of U.S. military officers and soldiers resulting from hostile or non-hostile occurrences during the Vietnam War. 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.¹⁷

In total, we observe 56,630 casualties. From these, we remove casualties assigned to a hometown address that corresponds to a military base, and casualties caused by illness or self-inflicted harm. The resulting number of casualties is 55,266, of which 86% is represented by white soldiers, and 13% by African American soldiers. The geographical distribution of casualties spans the entire U.S., and it is not specific to the cohorts born before or after 1946. Casualties are in fact concentrated in the period 1965–1973, and are almost entirely represented by the generation born in the 1940s, with an average age at death of 23 (Appendix C.3). Because the probability of death during the conflict is cohort-specific (i.e., some cohorts enter the war in the period with the largest mortality), we compute as the main outcome variable the cohort-specific share of deaths from each county. For each cohort h and county c combination, this is defined as the ratio between the number of casualties in cohort h whose hometown was in county c over the total total number of casualties in cohort h . We define cohorts using the exact date of birth and computing age relative to the start date of *Operation Intolerance*.

3.5 Salience of civil rights on newspapers

While television was neither present nor impactful at this time, newspapers complimented radio broadcasting and played a crucial role in disseminating information, facilitating public discourse, and influencing opinions. To build a measure of salience of civil rights, we collect data from local newspapers using the online archive at [newspapers.com](#), mapping newspapers to counties based on the location

¹⁶Only 25% of those who served were draftees, as compared to 66% during World War II. Eligible men aged 17 or older had the option to volunteer (with 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. Those classified as available for service had the option to volunteer, allowing them to select the service branch and serving for a shorter period. Draftees were instead typically assigned to the Army and served for up to three years (Card and Lemieux, 2001).

¹⁷Concerning the location of birth, the dataset provides the *home of record* address, that is, the place recorded as the home of the individual when commissioned, appointed, enlisted, inducted or ordered on active duty. Due to the young age of most soldiers, we assume this is the place where they grew up.

of their headquarters.

The main limitation of this archive is that it only allows computing the number of pages containing a specified word or combination of words. We impose a bag-of words approach (see, e.g., [Gentzkow and Shapiro, 2010](#); [Beach and Hanlon, 2022](#)), treating each page in a newspaper as an unstructured matrix of words and exploring the unconditional frequency of words' appearance. For each month t in the period 1930–1980, we compute the total number of pages in the newspapers published in a specific county c , which we label $all_pages_{c,t}$. For the U.S., the archive contains more than 51 million pages for this period.¹⁸ For a pre-specified theme k , we compute the number of pages mentioning the word or combination of words indexing the theme, which we label $pages_{kc,t}$. We then aggregate these monthly-specific data into annual measures by grouping information in periods of 12 months relative to the launch of *Operation Intolerance*. We indicate these year-groups by y . For instance, $all_pages_{c,y=1946}$ and $pages_{kc,y=1946}$ are the total number of pages published in newspapers, and the total number of pages covering theme k in the period running from April 1946 to March 1947. In line with [Beach and Hanlon \(2022\)](#), we finally define the salience of a theme k in county c in year-group y as the frequency of the theme:

$$salience_{kc,t} = \frac{pages_{kc,t}}{all_pages_{c,t}}. \quad (1)$$

While equation (1) focuses on a specific theme, we are interested in measuring the overall salience of civil rights. We therefore collect this measure for 25 themes that were salient in the rise of the civil rights narrative in the U.S. throughout the period 1930–1980. Appendix D.5 provides further details on how themes were identified, the search strings assigned to each theme, and descriptive statistics on the salience of each theme.

Our measure of salience of civil rights, which we label *Civil Rights Narrative*, is then constructed by aggregating individual measures using Principal Component Analysis (PCA). To maintain consistency in thematic analysis and avoid conflating the intensity of certain themes with the emergence of new ones, we exclude themes that were not used before 1946 from this index. Specifically, we exclude themes that fall into the bottom 20% of average salience for the period from 1930 to 1946, and we winsorize each series at the 1st and 99th percentiles to avoid over-weighting abnormally large values in the index. We calculate the index using the first principal component, which captures 33.3% of the variation in our

¹⁸In the archive, newspapers are not present for all counties, either because they are missing from the archive or because the county had no active newspaper at that time. In regression analysis, to avoid focusing on an unbalanced panel, we select only counties where newspapers are present in the dataset for at least 70% of observations in the period of analysis. Appendix Figure D24 highlights the counties with available data. Appendix D.5 provides estimates selecting counties where newspapers are present in the dataset for at least one period.

sample. Appendix D.5 presents alternative procedures for building the index and selecting themes.

3.6 Voting and mobilization

We first focus on a measure of voting in favor of segregation at the county level. We limit this indicator to the core Deep Southern states Alabama, Georgia, Louisiana, South Carolina and Mississippi, where segregation was enforced by law in the 1940s. We gather data for a large number of local elections from 1926 to 1964 from [Heard and Strong \(2006\)](#) and [Bartley and Graham \(2006\)](#). We include county-level vote shares in the elections of Governor, Lieutenant Governor, National Committeeman, President and Senators.

Building a measure of pro-segregation voting requires classifying all candidates based on their stance on segregation. However, in the vast majority of cases, explicit positions are not available, especially for those who lose the elections. Additionally, such public positions might also change over time. Therefore, we classify politicians implementing a data-driven approach based on voters' behavior. We first collect data on the outcomes of public referendums related to segregation at the county level between 1946 and 1960. Referendums typically involved constitutional amendments on school desegregation and voter disenfranchisement laws. Using the results of these referendums, we define for each state the county with the strongest support of segregationist policies as the one with the largest vote share in favor of segregation, and assume this dimension is constant over the period of analysis. Appendix Table C.4 provides an overview of the utilized referendums and the respective vote share for segregationist policies in the majority county, as well as the corresponding state averages. In each election, we classify a candidate as being relatively more pro-segregation if they obtained the largest share of votes in this county. Finally, we compute our measure as the county-specific share of votes devoted to a pro-segregation candidate.

We complement the voting data with information on mobilization related to segregation and civil rights. First, we focus on county-level presence of KKK chapters. We collect this information for periods before and after *Operation Intolerance* from separate sources. For 1942, we use [Kneebone and Torres \(2015\)](#), which lists KKK chapters active during the Second KKK (1919–1942) and provides the dates on which each chapter first appeared. Using this latter information, we construct a measure of presence for 1932 to gather further evidence of presence before the launch of *Operation Intolerance*. We obtain presence in 1965 from the list of chapters analyzed in the [Committee on Un-American Activities \(1967\)](#), a source also used in [Mazumder \(2018\)](#). Finally, we obtain presence in 2000 and 2020 from the [Southern Poverty Law Center \(2023\)](#), which provides an annual census of hate groups operating in the U.S. starting from

the year 2000. We consider all groups identified with an ideology linked to the KKK.

Second, we focus on county-level presence of National Association for the Advancement of Colored People (NAACP) branches. NAACP is the most prominent civil rights organization in the U.S., promoting advocacy, legal rights, and grassroots mobilization to end racial discrimination and voter suppression, and to establish criminal justice and equality of access to education. Founded in 1909, the organization experienced significant growth during the 20th century and remains active.

We obtain the location of NAACP chapters in 1925, 1942, and 1961 from [Estrada and Hermida \(2023\)](#).¹⁹

Second, we digitized the presence of NAACP in 2020 using web-scraping.²⁰ Appendix C.2 provides descriptive statistics about the share of counties in which each group is found from the 1920s to current times. 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.

4 Empirical approach

This paper aims to identify the causal effects of *Operation Intolerance*, a sudden and unanticipated shift in the narrative of the popular radio program *The Adventures of Superman* in 1946. We encounter two main challenges in achieving this objective. The first challenge is establishing that exposure to the signal of *Operation Intolerance* during 1946 was effectively random. The second challenge is disentangling the effects of *Operation Intolerance* from those of *The Adventures of Superman* and of other content broadcast on the same network during the same period.

Let us start with the first challenge. A large number of papers exploits variation in signal reception induced by topographic obstacles to construct random exposure to either radio or television signals (see, for example, [Enikolopov et al., 2011](#); [Yanagizawa-Drott, 2014](#); [Olken, 2009](#); [Adena et al., 2015](#); [DellaVigna et al., 2014](#); [Armand et al., 2020](#)). As discussed in Section 3.1, this strategy is suitable for identifying the causal effects of programs broadcast on either FM radio or television. This approach is unsuitable for our setting because AM propagation can surpass topographic obstacles ([Adena et al., 2015](#)). Our radio signal

¹⁹[Estrada and Hermida \(2023\)](#) provide the list of chapters in the period 1957–1963 (which we label as 1961), and in 1964. We do not use information for the year 1964 due to the large discrepancy between the number of geo-coded chapters and the aggregate number of chapters reported by NAACP for the same year.

²⁰We collected addresses of currently-active branches by scraping all active NAACP websites, Google Maps locations, and the list of chapters registered in the U.S. Internal Revenue Services database. We geo-located each branch using the city reported in their address. Web-scraping was performed in May 2023, but we assign the year 2020 because we do not observe the exact moment in which a branch is active.

coverage calculations are specifically designed to accurately capture AM radio signal propagation. This approach is specifically tailored to account for the unique characteristics of AM transmission, including its ability to travel beyond line-of-sight through surface waves, which are less affected by topographic obstacles and more influenced by soil conductivity. This specificity ensures that our analysis accurately reflects the reach and impact of the broadcasts of *Operation Intolerance*. Furthermore, because soil conductivity between the transmitter of the signal and the receiver is arguably random (Strömborg, 2004), in equidistant points from a transmitter, the probability to receive or not the signal of *Operation Intolerance* is plausibly exogenous.

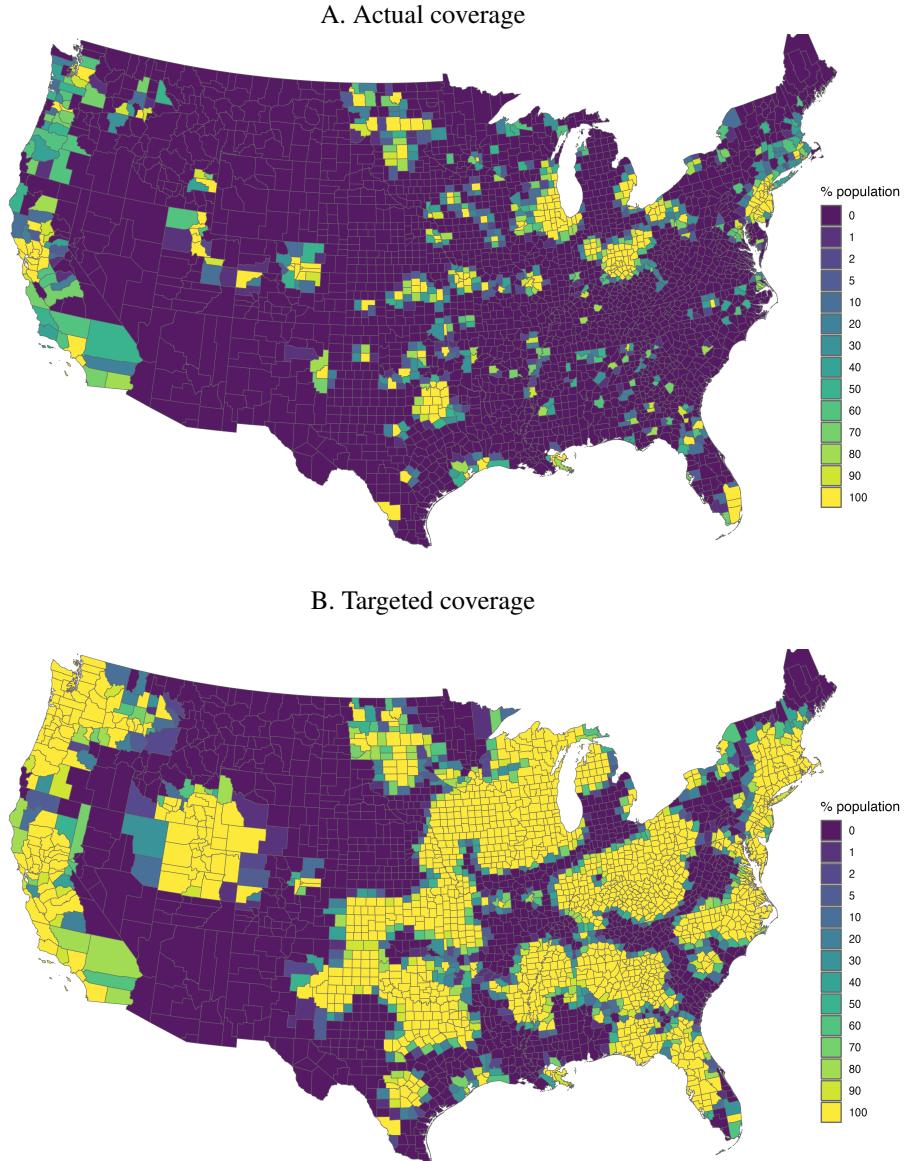
Following this approach, we define our main treatment variable as the predicted share of the population living in each county that was covered by the signal of *The Adventures of Superman* in 1946.²¹ We label this variable as R_c^{1946} and plot the geographical distribution in Panel A of Figure 3. In line with the literature investigating the effects 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 take-up (which is unobservable in our setting).

Following the large literature on mass media, we combine the predicted coverage R_c^{1946} with the targeted coverage of *Operation Intolerance*, that is, the theoretical coverage of the broadcast assuming for the entire country the maximum soil conductivity found in the U.S. (30 mS/m ; Appendix Figure A4 provides a detailed map of different conductivity zones). We label this variable as $free_c^{1946}$ and plot the geographical distribution in Panel B of Figure 3. This is comparable to the “free field coverage”—the theoretical coverage in the absence of topographic obstacles—used to identify causal effects in the context of FM or TV broadcasts (see, for example, Olken, 2009).

The second challenge involves disentangling the effect of *Operation Intolerance* from the effects of *The Adventures of Superman* and other content broadcast on the same network around this time. This is a challenge distinct from most papers focusing on the impact of a radio program. Unlike the extant literature our goal is to estimate the effect of a change in the content of an existing program. To address this challenge, we rely on a **cohort study** specification. Here, we undertake within-age cohort comparisons of individuals from different age groups in 1946—those living within the coverage area of the radio signal to those outside it. The underlying assumption is that individuals in the age groups targeted by

²¹We convert the continuous values of radio coverage described in Section 3 into binary coverage indicators using the threshold of $66 \text{ dB}\mu\text{V/m}$ field strength, broadly considered as the required sensitivity limit for successful AM reception (ETSI, 2021). We then calculate the share of the population of each county covered by the signal by overlaying the 1940 population data from the History database of the Global Environment (HYDE), available at the spatial resolution of 5 arc-minutes, which is approximately 10 kilometers at the equator (Klein Goldewijk et al., 2017). Appendix D.3 shows robustness of main results to using alternative definitions of coverage.

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



Note. Panel A displays the geographical distribution of the share of a county's population covered by the signal of the radio program *The Adventures of Superman* in 1946, based on the coverage calculations described in Section 3.1, overlaid with the 1940 cell-level population estimates from Klein Goldewijk et al. (2017). Panel B shows the same distribution, but using a signal strength computed assuming homogeneous ground conductivity across the U.S. at 30 mS/m (the maximum observed in the country). Signal strength under maximum conductivity is computed using the *Field Strength Calculator One* software and applying the ITU-R P.368-7 algorithm, the same algorithm used to generate actual coverage predictions in panel A. In both panels, we consider a cell as covered if it has a medium signal strength of at least $66 \text{ dB}\mu\text{V}/\text{m}$. Each cell is weighted by population to compute a county-level average.

Operation Intolerance could have listened to the program, whereas those who were either too old, too young, or not yet born would not have been directly exposed to the episodes. This method allows us to isolate the program's potential influence by focusing on demographic segments most likely to have been

affected. We estimate the following specification:

$$Y_{ihc,t} = \sum_{\tau=\underline{h}}^{\bar{h}} \gamma_\tau D_\tau \cdot R_c^{1946} + \sum_{\tau=\underline{h}}^{\bar{h}} \gamma_\tau D_\tau \cdot \text{free}_c^{1946} + X'_{ihc,t} \lambda + \mu_h + \mu_c + \mu_{c,t} + \epsilon_{ihc,t} \quad (2)$$

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 $h = \tau$, with cohorts ranging from \underline{h} to \bar{h} . To define cohorts, we consider (hypothetical) age at the beginning of *Operation Intolerance* in 1946. For the analysis of attitudes, we pool cohorts into groups of 5 years to obtain sufficient within-cohort variation in the outcome variables. $X'_{ihc,t}$ is a set of individual-characteristics, including age, gender and whether the respondent lived in a rural setting during childhood, while μ_h and μ_c are cohort and county fixed effects, respectively. To control for local trends in both the outcome variable and radio exposure, $\mu_{c,t}$ controls for spatially specific time effects, including survey year fixed effects, interaction terms between survey year indicators and state indicators, and between survey year indicators and county characteristics that predict the expansion of the MBS radio network before 1946.²² Finally, the error term $\epsilon_{ihc,t}$ is assumed to be clustered at the county level. Appendix D.3 shows robustness of our main results to alternative sets of controls and to assuming spatial correlation in the errors.

To provide a single estimate for the effect on the population directly targeted by the program (i.e., children and young adults), in the tables, we provide estimates of equation (2) but grouping the age groups 5–15 (i.e., those 3–17 years old in 1946) into a single cohort, which we label as the *target* cohort. These estimates are thus comparing respondents in this group with those in older cohorts (i.e., those too old to be targeted by the broadcast) and younger cohorts (i.e., those not born or too young to be able to hear the broadcast). As is common in mass media research, we do not observe who actually listened to the full set of episodes of *Operation Intolerance*. We therefore need to make assumptions regarding the cohorts most likely targeted by the program, basing this decision on the time slot used by *The Adventures of Superman* and on qualitative evidence (see Section 2). We provide further evidence on this grouping in Section 5. Additionally, for each outcome variable, we also present estimates from equation (2), which treats cohorts separately and does not require this grouping assumption.

²² Appendix A shows that the expansion of this radio network was primarily driven by new antennas built in the 1920s and 1930s. By examining changes in county-level characteristics between the 1930 and 1940 censuses, we show that a wide variety of indicators—pertaining to population composition and economic and political outcomes—are uncorrelated with the 1946 coverage. Although differences in trends would not pose a threat to identification in a cohort study, our main specification includes characteristics whose trends predict coverage with a p-value smaller than 0.2. These variables include population density, the share of the population living in urban areas, the share owning a radio, the share of illiterate individuals, and the share of male population. Results are robust to removing these interaction terms from the main specification (Appendix D.3).

We complement the cohort study specification with an **event study** (or dynamic difference-in-differences) specification applied to county-level panel data, rather than individual observations. This approach compares over time counties covered by the signal of *Operation Intolerance* in 1946 with counties not covered. We estimate the following specification:

$$Y_{c,t} = \sum_{\tau=0}^{\bar{T}} \gamma_\tau P_\tau \cdot R_c^{1946} + \sum_{\tau=0}^{\bar{T}} \gamma_\tau T_\tau \cdot \text{free}_c^{1946} + \mu_c + \mu_{c,t} + \epsilon_{c,t} \quad (3)$$

where $Y_{c,t}$ is the outcome variable for county c at time t , P_τ is an indicator variable if the observation refers to the period $t = \tau$, with t ranging from time 0 to time \bar{T} . The remaining terms are defined in line with equation (2).

While the cohort study specification enables us to disentangle the impact of *Operation Intolerance* from *The Adventures of Superman* and the broader content broadcast by MBS in 1946, the event study approach complements this by capturing both the effects of *Operation Intolerance* and the general content broadcast by MBS during the same year. It is important to highlight that the radio network broadcasting *Operation Intolerance* was specific to 1946. Therefore, it is unlikely that our identification strategy captures the effect of radio broadcasts beyond those transmitted by MBS in that year. Radio networks in the U.S. expanded and changed significantly in the 1940s, with MBS representing only one of the active networks of that decade. The 1950s marked the beginning of television's expansion, which substantially reduced the centrality of radio as a mass medium over time (Gentzkow, 2006).²³ In addition, all the units covered by the intervention are “treated” simultaneous, rendering our specification immune to problems associated with heterogeneity in the dynamic treatment effects observed in staggered designs. Similarly to equation (2), in the tables, we provide estimates by pooling post-1946 observations while maintaining all other variables consistent with those in equation (3).

The interpretation of estimates in both approaches relies on understanding whether *Operation Intolerance* involved anticipation effects or spillover effects onto individuals who were not directly targeted by the broadcasts, such as adults, through other prominent media channels. We can discount the possibility of spillover through television, as only 8,000 U.S. households owned television sets in 1946 (Anderson, 2005). We investigate the possibility of spillovers related to newspapers by examining the share of newspaper pages from that period that references topics related to *Operation Intolerance*. We start by examining the share of pages mentioning the word *Superman*, or *Superman* and *radio* together to specif-

²³The number of AM stations increased 2.5 times in the 1940s, from 847 to 2,144 (US Bureau of the Census, 1975). TV penetration went from 9% in 1950 to 86% in 1959 (Allen and Thompson, 2023).

ically capture mentions of *Superman on radio*.²⁴ Next, we focus on the core themes of the episodes by examining the share of published pages that mention bigotry, intolerance, prejudice, or related derivatives of these words.

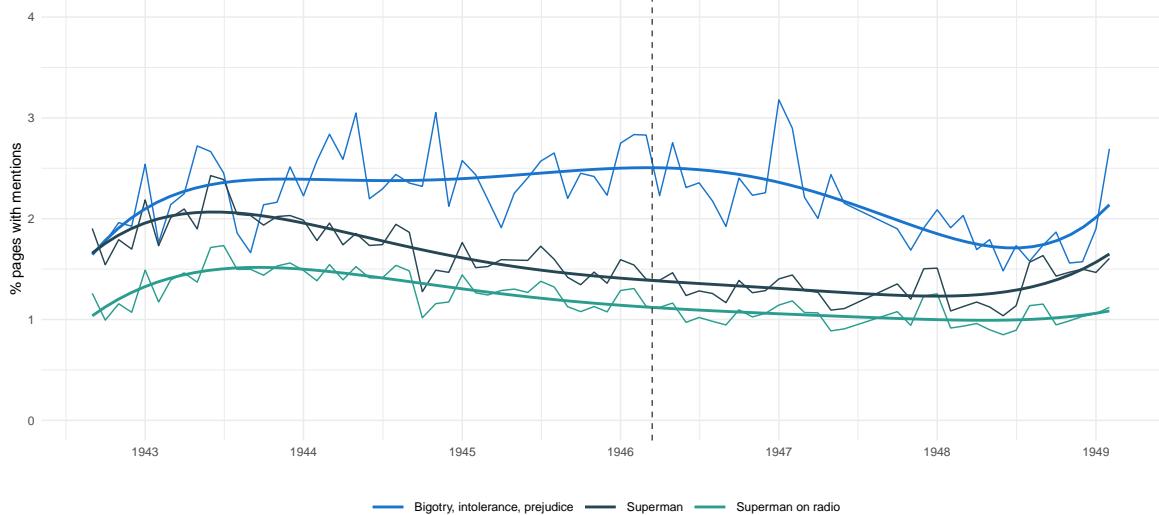
Figure 4 shows that at the time of the launch of *Operation Intolerance*, in April 1946, newspapers made reference to Superman in 1.39% of pages. The share was relatively stable throughout the period, starting at 1.15% in August 1942 and ending at 0.86% in May 1949. Restricting to pages covering Superman on radio, we observe a small drop in the share of pages, but the pattern is unchanged. This suggests that the vast majority of mentions were about radio schedules. Hence, overall media attention to Superman in local newspapers was relatively small. Importantly, we do not observe major changes right before or right after the launch of *Operation Intolerance*.²⁵ Similarly, discussions on topics related to bigotry, tolerance, and prejudice did not show significant changes in newspapers. These themes were slightly more prevalent than mentions of *Superman*, with an average share of pages mentioning these topics standing at 2.23% in April 1946.

Overall, these findings suggest that neither *Superman* nor the core topics of *Operation Intolerance* enjoy increased media attention around the period of April 1946, allowing us to rule out anticipation or spillover effects. Furthermore, in Appendix D.5, we observe parallel trends in the evolution of attention to these topics prior to the launch of *Operation Intolerance*, further strengthening our identification strategy.

²⁴These pages encompass a wide range of references to Superman, including articles about Superman (including those about *Operation Intolerance* published in and after April 1946), radio schedules featuring *The Adventures of Superman*, and comic strips with Superman. We provide some examples in Appendix D.5.

²⁵*Superman* was more salient in newspapers published in areas covered by the radio signal of *Operation Intolerance*, but we do not observe any significant change in media attention even when focusing specifically on those areas or examining the likelihood of mentions of related topics instead of just the share of pages (Appendix D.5).

Figure 4: Newspaper coverage of Superman and topics related to *Operation Intolerance*



Note. This figure displays the share of pages published in local newspapers that cover specific topics, with shares multiplied by 100. It spans the same period as Figure 1, covering August 1942 to February 1949. The terms *bigotry*, *intolerance*, and *prejudice* refer to pages where any of the words—*bigotry*, *intolerance*, *prejudice*, or their related derivatives—appear at least once. Our search targets pages containing words starting with *intoleran*, *bigot*, or *prejudic*. For example, searching words starting with *intoleran* captures pages with the noun *intolerance*, the adjective *intolerant*, or the adverb *intolerantly*. *Superman* refers to pages where the word *Superman* appears at least once. *Superman on radio* refers to pages where the words *Superman* and *radio* appear on the same page at least once. See Section 3.5 for details about the data source.

5 Results

5.1 Support for civil rights

We begin by investigating the persistent effects of the 1946 broadcasts of Superman’s *Operation Intolerance* on attitudes towards civil rights. Since support for civil rights is captured through several survey questions that may not be collected in every survey round, we reduce the dimensionality of the survey data into a single indicator, which we label the *Support for Civil Rights Index*. This index combines responses from the questions described in Section 3.2, following the approach of Kling et al. (2007). It involves standardizing individual indicators and averaging the z-scores for all available variables for each respondent. This approach facilitates a canonical interpretation of the estimation results and addresses potential issues related to multiple hypothesis testing.²⁶ Panel A of Figure 5 plots the average of the index for different cohorts. We first observe that younger cohorts in 1946 are more supportive of civil rights compared to those born before 1946. This is in line with American society becoming more progressive over time. We find a difference of 0.29 standard deviations between the respondents in the age cohort -10 (i.e., those born in the years 1954–1958) and those in the age cohort 50 (i.e., those born

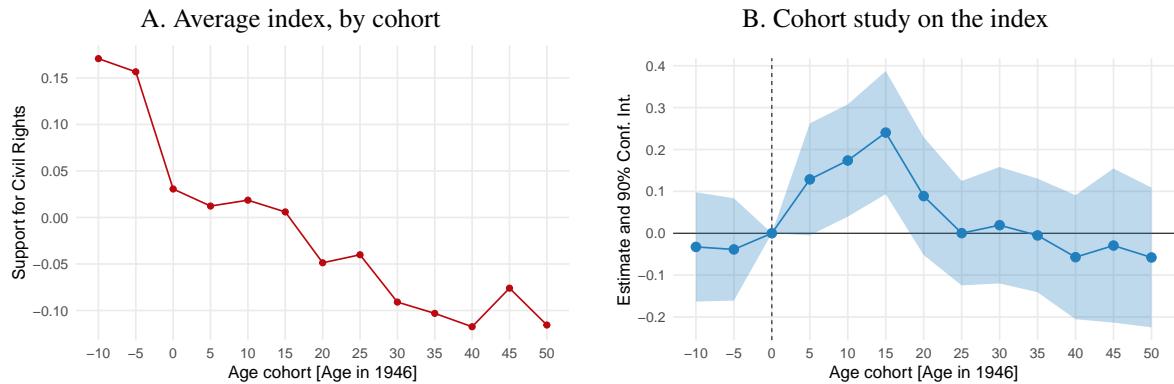
²⁶ Appendix D.2 presents results using an alternative index built using regularized iterative PCA (Josse and Husson, 2012, 2016), a method that accommodates incomplete data structures. Results are in line with those presented in the main text.

in the years 1894–1898).

Panel B of Figure 5 provides cohort study estimates of the effect of *Operation Intolerance* on the Support for Civil Rights Index using equation (2). We observe an increase in support for civil rights among the respondents in the age cohorts 5–15 (i.e., those who were 3–17 years old in 1946). The estimates are highest and significant at the 1% level for the age cohort 15, while they are smaller for the age cohorts 10 (significant at the 5% level) and 5 (significant at the 12% level). This result further supports the fact that the program targeted children and young adults, justifying our assumption to treat the 5–15 age range as the target cohorts, as discussed in Section 4.

We do not observe any effect on older or younger cohorts, showing that effects on support for civil rights are specific to the cohorts that were specifically targeted by and able to listen to the program. Importantly, the absence of effects among younger cohorts (i.e., those who were not yet born or too young to understand the program) indicates that the narrative of *Operation Intolerance* was either not passed down to younger siblings in the years following the broadcast, or that generational convergence is absorbing the effect (i.e., over time, all younger generations become more supportive of civil rights, with larger gains in areas not covered by the broadcast). Nevertheless, this result underscores the importance of direct exposure to the program, rather than an effect transmitted across generations.

Figure 5: Support for civil rights



Note. Panel A plots the *Support for Civil Rights Index*, averaged by age cohort in 1946. The index aggregates z-scores from individual questions that capture support for civil rights. Descriptive statistics and temporal coverage of the variables comprising the index are presented in Appendix C.1. Panel B presents the cohort study plot of the effects of *Operation Intolerance* on the *Support for Civil Rights Index*. This figure plots the coefficients from equation (2) of the interaction term between the age cohort in 1946 and exposure to *Operation Intolerance* in the county, defined as the share of the population in the county that was covered by the radio signal of the program in 1946. The shaded area indicates the confidence intervals at the 10% level, computed clustering errors at the county level. The vertical line indicates the cohort born at the time of *Operation Intolerance*. Additional details about the variables are available in Appendix C.1.

To summarize effects into a single estimate, in Table 1, we provide estimates of equation (2) grouping the *target* cohorts into a single cohort. Panel A provides estimates of equation (2) using all available cohorts in the data. Panel B excludes younger cohorts, comprising individuals who were younger than

three years or those who were yet to be born in 1946. Column (1) focuses on the Support for Civil Rights Index, while columns (2)–(10) provide estimates for each individual indicator comprising the index, reported in z-scores for comparability. For these outcome variables, the estimates using equation (2) without grouping any cohort are presented in Appendix D.1.

Operation Intolerance leads to a significant increase in the support for civil rights. In the target cohorts, the Support for Civil Rights Index is 0.18 standard deviations higher among children who lived in areas fully covered by *Operation Intolerance* compared to those who did not. If we consider the age cohort 15 as our baseline—the cohort showing the largest effects—this difference is equivalent to a generational gap of approximately 20 years. In other words, to observe a difference in the index of a magnitude equivalent to what the cohort study estimate shows, we need to compare it to the index of the age cohort -5. Furthermore, dropping younger cohorts (who are more progressive than older cohorts, independent of the exposure to the broadcast) from the specification (panel B) leads to comparable estimates, reinforcing the importance of being able to directly listen to the program at the time of the broadcast in explaining the increase in support for civil rights. Results are robust to alternative specifications, to alternative measures of exposure to the broadcast, and to controlling for coverage of other radio stations, for which we record no effect on the index (Appendix D.3).

Columns (2)–(10) in Table 1 show that the increase in support for civil rights resulting from exposure to *Operation Intolerance* is not driven by any single one of the nine individual variables that constitute the index of support for civil rights. In the target cohorts, those who lived in areas fully covered by the broadcast are significantly more favorable towards civil rights leaders and the Black population, and more unfavorable towards Southerners and segregationists. Additionally, they significantly support affirmative action for the Black population and racial desegregation. Increased support for civil rights leaders and for affirmative action represent endorsements of the Civil Rights Movement. We estimate an effect of 0.22 standard deviations on favorable feelings towards civil rights leaders (0.26 when excluding younger cohorts), and of 0.40 standard deviations on support for affirmative action (0.47 when excluding younger cohorts). Estimates for the effect on other indicators are not statistically significant at conventional levels, but they all indicate increases in support for civil rights.

The effects of *Operation Intolerance* specifically relate to attitudes toward racial discrimination, which were among the most salient in the period 1964–1980. In Appendix D.4, we show the absence of effects on attitudes unrelated to racial discrimination, such as those towards religious groups, economically disadvantaged or advantaged individuals, or towards the White population.

Table 1: Cohort study estimates on the effect on the support for civil rights

	Support for Civil Rights Index	Favorable towards...		Unfavorable towards...			Support for...			
		Civil rights leaders	Black population	George Wallace	Southerners	Affirmative action	Integrated schools	Black representation	Desegregation	Speeding up civil rights
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
A. All cohorts										
Target × Exposure	0.179*** (0.044)	0.223** (0.101)	0.176** (0.071)	0.102 (0.081)	0.180** (0.077)	0.393*** (0.100)	0.105 (0.078)	0.165 (0.138)	0.153** (0.067)	0.113 (0.078)
R ²	0.21	0.23	0.14	0.23	0.31	0.14	0.18	0.18	0.19	0.19
Observations	10503	5304	8145	8023	5207	6377	5872	3470	6836	7874
B. Exclude younger cohorts										
Target × Exposure	0.176*** (0.047)	0.259** (0.119)	0.184** (0.080)	0.043 (0.091)	0.105 (0.094)	0.472*** (0.110)	0.087 (0.084)	0.205 (0.160)	0.126* (0.076)	0.133 (0.088)
R ²	0.22	0.25	0.15	0.27	0.34	0.17	0.20	0.22	0.20	0.20
Observations	7842	3674	6368	5551	3934	4249	4562	2396	5086	6082

Note. Estimates are based on equation (2) grouping target cohorts into a single cohort. *Target* is an indicator variable equal to 1 for respondents who were 3–17 years old in 1946. *Exposure* denotes the share of the population in the county covered by the radio signal of *Operation Intolerance* in 1946. All specifications include controls for targeted coverage, state-by-year fixed effects, time effects, and individual controls (see Section 4). Panel A includes all available cohorts, while panel B excludes younger cohorts. Standard errors, clustered by county, are reported in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01). Column (1) uses the *Support for Civil Rights Index* as the dependent variable, aggregating z-scores from individual questions that capture support for civil rights. Columns (2) through (10) analyze the individual components of the index, also reported in z-scores: (2) *favorable towards civil rights leaders* measures feelings towards civil rights leaders, ranging from 1 (unfavorable) to 100 (favorable); (3) *favorable towards Black population* measures feelings towards the Black population, ranging from 1 (unfavorable) to 100 (favorable); (4) *unfavorable towards George Wallace* measures feelings towards George Wallace, ranging from 1 (favorable) to 100 (unfavorable); (5) *unfavorable towards Southerners* measures feelings towards Southerners, ranging from 1 (favorable) to 100 (unfavorable); (6) *support for affirmative action* measures beliefs about governmental efforts to improve the position of Blacks, ranging from 1 (Blacks should help themselves) to 7 (Government should help Blacks); (7) *support for integrated schools* is an indicator variable equal to 1 if the respondent believes that the government should ensure racially-integrated schools; (8) *support for Black representation* measures beliefs about the influence of Blacks in American life and politics, ranging from 1 (too much influence) to 3 (too little influence); (9) *support for desegregation* is an indicator variable equal to 1 if the respondent rejects strict racial segregation; (10) *support for speeding up civil rights* is an indicator variable equal to 1 if the respondent believes that civil rights leaders are not pushing too fast for their goals. Descriptive statistics and temporal coverage of the variables are presented in Appendix C.1.

5.2 Interracial assimilation

In this section, we shift our focus from self-reported attitudes to examine two real-life behavioral outcomes related to interracial assimilation. First, using the cohort study specification, we investigate mixed friendships. Specifically, we analyze an indicator variable that records whether respondents report having friends of a different race. Second, using the event study specification, we examine interracial marriages, defined as the number of marriages (per 1,000) where spouses are of different races.

Panel A of Figure 6 shows the average of mixed friendships across cohorts. In line with our previous findings that younger cohorts are more progressive on civil rights, and considering the ongoing process of racial assimilation throughout the 20th century, we observe that younger cohorts also exhibit greater assimilation in terms of friendships. The share of mixed friendships more than doubled if we consider the two extreme cohorts. For respondents in the oldest cohort in the sample, the age cohort 40 (born in the years 1904–1908), less than 30% reports mixed friendships. On the other side of the spectrum, respondents in the younger cohort in the sample, the age cohort -5 (born in the years 1939–1943), 60% report mixed friends.

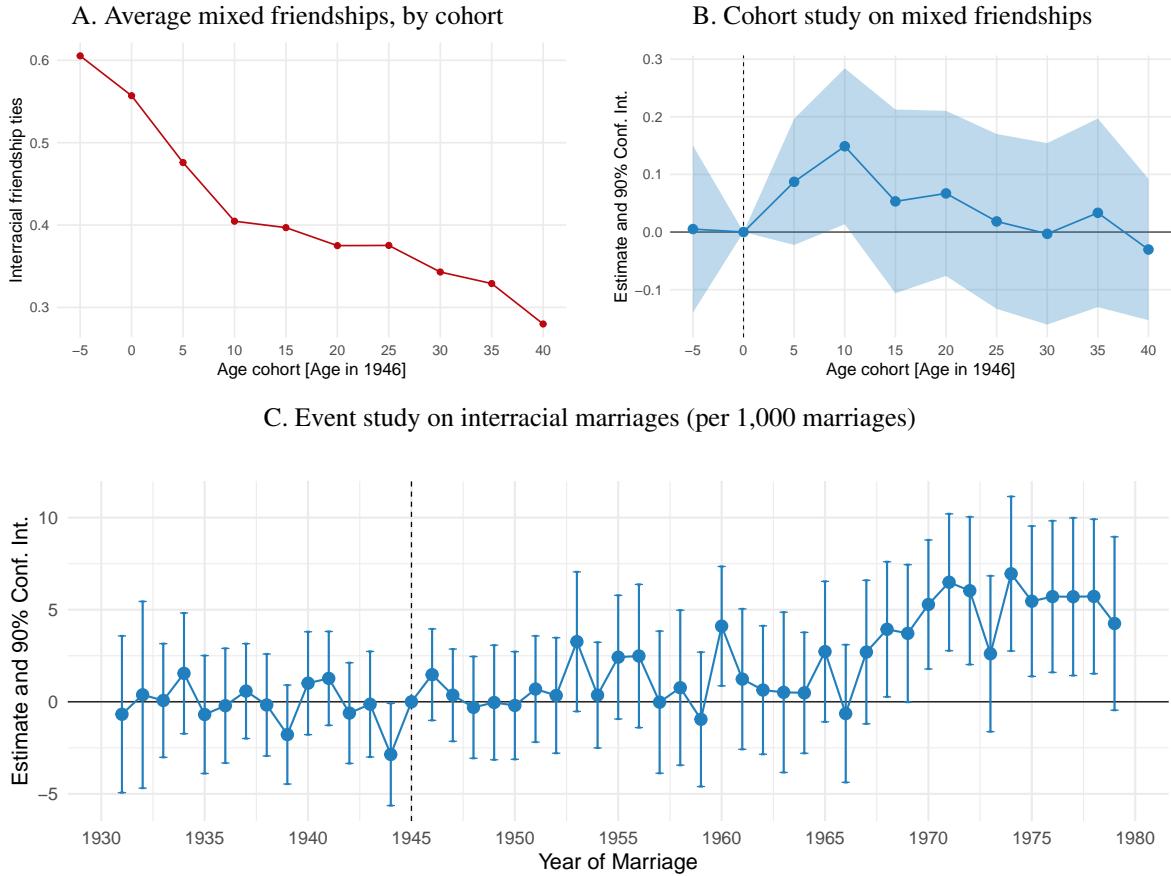
Panel B of Figure 6 plots estimates from equation (2), demonstrating how the probabilities of reporting mixed friendships across cohorts are influenced by the exposure to the broadcasts. Similar to the effect on support for civil rights (Figure 5), we observe an effect of *Operation Intolerance* primarily in the target cohorts. The largest effect is for the age cohort 10, while for the age cohorts 5 and 15 the estimates are not statistically significant.

Column (1) in Table 2 summarizes the effect of *Operation Intolerance* in the target cohorts, using equation (2) and grouping the target cohorts into a single cohort. As in the previous section, Panel A provides estimates using all available cohorts in the data, while Panel B excludes younger cohorts, comprising individuals who were younger than three years or those who were yet to be born in 1946. Respondents exposed to the broadcast in 1946 are significantly more likely to report mixed friendships. Respondents in the target cohorts who resided in counties where 100% of the population was covered by *Operation Intolerance* in 1946 experience a 9.1 percentage point increase in the likelihood of having mixed friendships. This effect is robust even when younger cohorts are excluded from the estimating equation, reducing the magnitude of the effect to 8.7 percentage points. If we take again the cohort 15 as our base, the magnitude of the effect corresponds to a generational gap of 10–15 years, meaning that it would have taken this amount of time to achieve such a change in racial assimilation among their friends. Similar to the results on support for civil rights (Section 5.1), the magnitude of the effects is large compared to

societal progress in this dimension.

We complement cohort study estimates with society-wide estimates on racial assimilation by focusing on interracial marriages from 1931 to 1979. Panel C in Figure 6 shows event study estimates for interracial marriages, using equation (3). This graph plots the coefficients for each year (relative to 1945), illustrating how the estimates evolve over time. Meanwhile, Table 2 presents estimates of the same equation (3), pooling post-1946 observations. Column (2) shows results by pooling all post-1946 observations, while column (3) takes into account the landmark 1967 Supreme Court ruling in *Loving v. Virginia*, which declared anti-miscegenation laws unconstitutional. This column pools observations separately for the periods 1946–1967 and post-1967 and adds an interaction term between exposure to *Operation Intolerance* and the period after 1967. As discussed in Section 3.3, these regressions use the census enumeration area as the unit of observation.

Figure 6: The effect of *Operation Intolerance* on interracial assimilation



Note. Panel A displays the average by age cohort in 1946 for *mixed friendships*, an indicator variable set to 1 if the respondent reports having friends of different races, and 0 otherwise. Panel B illustrates the cohort study effects of *Operation Intolerance* on this indicator. It plots the coefficients from equation (2) of the interaction term between the age cohort in 1946 and the exposure to *Operation Intolerance* in the county. The shaded area represents the confidence intervals at the 90% level with errors clustered at the county level. Panel C plots the event study effects of *Operation Intolerance* on *interracial marriages*, defined as the number of marriages where spouses are of different races per 1,000 marriages, specific to each census enumeration area. It plots the coefficients from equation (3) of the interaction term between year indicators and exposure to *Operation Intolerance* in the county. Confidence intervals are computed at the 90% confidence level with errors clustered at the county level. The vertical lines in Panel B indicate the cohort born at the time of *Operation Intolerance*, and in Panel C, the year of *Operation Intolerance*. Additional details about the variables are presented in Appendix C.1.

We observe a notable increase in the share of mixed marriages in counties that were covered by *Operation Intolerance* in 1946 compared to those that were not covered. In areas where the population was fully covered, there is an increase of 1.76 additional mixed marriages for every 1,000 marriages in the post-1946 period, relative to 1945. Conversely, we do not find any differential pattern before 1945. Importantly, this estimate is primarily driven by the post-1967 period, highlighting the importance of removing legal barriers to interracial marriages in promoting assimilation. Before 1967, we do not observe clear differences in mixed marriage rates between areas with varying degrees of exposure to the program. Brought together, the cohort study and the event study estimates highlight that *Operation Intolerance* was influential not only in shifting attitudes in support of civil rights in 1946, but also in influencing racial

assimilation during the decades following the broadcast.

Table 2: The effect on interracial assimilation

	Mixed friendships (1)	Interracial marriages (per 1,000 marriages) (2)	(3)
A. Cohort study – All cohorts			
Target × Exposure	0.091** (0.042)		
R ²	0.24		
Observations	5,662		
B. Cohort study – Exclude younger cohorts			
Target × Exposure	0.087* (0.051)		
R ²	0.24		
Observations	4,487		
C. Event study			
Post 1946 × Exposure		1.76** (0.735)	0.888 (0.646)
Post 1967 × Exposure			3.49*** (1.08)
R ²	0.46		0.46
Observations	55,958		55,958

Note. Estimates in Panels A and B are based on equation (2), grouping target cohorts into a single cohort. *Target* is an indicator variable set to 1 for respondents aged 3–17 years in 1946, while *exposure* measures the share of the county population covered by the radio signal of *Operation Intolerance* in 1946. Panel A includes all available cohorts, whereas Panel B excludes younger cohorts. In panel C, estimates are based on equation (3) and pooling all post-1946 observations. All specifications include controls for targeted coverage, state-by-year fixed effects, time effects, and individual controls (see Section 4). *Post 1946* is an indicator variable set to 1 for observations after 1946, and *post 1967* similarly indicates observations after 1967. Standard errors, clustered by county, are reported in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01). Dependent variables, reported in the column headers, are defined as follows: *mixed friendships* is an indicator variable equal to 1 if the respondent reports having friends of different races, and 0 if all friends are of the same race; (2) *interracial marriages* represents the number of marriages per 1,000 where spouses are of different races, specific to each census-enumeration-area. Additional details about the variables are presented in Appendix C.1.

5.3 Dissent and institutional trust

The rise of civil rights in the U.S. during the 1950s and 1960s, marked by widespread mass protests, prompts us to examine whether *Operation Intolerance* not only enhanced support for civil rights and racial assimilation but also contributed to the mass mobilization characteristic of the Civil Rights Movement. While we do not observe direct participation in this movement, we focus on indirectly-related outcomes, such as dissent and institutional trust. Table 3 presents cohort study estimates of the effect of *Operation Intolerance* on these outcomes using equation (2) and pooling target cohorts into a single group. Columns (1)–(5) focus on self-reported attitudes on dissent and institutional trust, while column (6) supplements these results with estimates of the effect on a behavioral outcome, participation in the Vietnam War. Because we do not observe participation at individual level (see Section 3.2), we estimate this specification at the cohort-county level, thus comparing the distribution of deaths within a cohort across counties with varying exposure of *Operation Intolerance* in 1946 as a proxy for participation. As

in the previous sections, Panel A provides estimates using all available cohorts in the data, while Panel B excludes younger cohorts. This exclusion is not feasible in column (6) because the number of cohorts that participated in the war restricts comparisons to only the younger cohorts.²⁷ For each variable presented in Table 3, Appendix D.1 provides estimates using equation (2) without grouping cohorts.

Columns (1) and (2) focus on attitudes towards dissent by investigating whether respondents approve or disapprove of protests and demonstrations. In the target cohort, *Operation Intolerance* led to a significant increase in support for protests. Residing in a county that was fully covered by the broadcast increases support by 0.25 standard deviations compared to those living in a county that was not covered by the broadcast. Excluding the younger cohorts raises the estimate to 0.30 standard deviations, suggesting that part of the effect is absorbed by younger cohorts who are also relatively more supportive of protests in areas covered in 1946, albeit the effect is small. While these effects are specific to protests, a similar pattern is observed for the more general support for any demonstration. However, the estimate only becomes statistically significant when younger cohorts are excluded (Panel B). In this sample, we observe an increase of 0.20 standard deviations in support for demonstrations, significant at the 10% level. These results highlight that the effects of *Operation Intolerance* align with the mass protest nature of the Civil Rights Movement.

Columns (3)–(5) shift the focus to institutional trust by examining the level of trust in the federal government and respondents’ favorable feelings towards the police and the military. The use of force by the police was the catalyst for many of the race riots in 1960s, and the end of police brutality was one of the core demands of the Civil Rights Movement (Wasow, 2020). Similarly, attitudes towards the military were closely related to attitudes toward the Vietnam War. During the 1960s in America, objections to the war were closely linked to support for the Civil Rights Movement, with many civil rights leaders actively discouraging participation. For these reasons, it is important to relate attitudes towards dissent and attitudes towards the state and its apparatus for law and order.

We observe that *Operation Intolerance* led to reduced trust in the federal government, although the coefficients are not statistically significant. However, there is a statistically significant reduction in favorable feelings towards the police and the military. The estimates correspond to a reduction of 0.29 standard deviations for favorable views towards the police, and 0.17 standard deviations for favorable views towards the military. Excluding younger cohorts results in comparable estimates, indicating that the effects

²⁷Deaths are concentrated in a limited number of cohorts and over a short period of time (see Appendix C.3). We select only those cohorts where the number of casualties exceeds 400. This effectively selects individuals who were between -5 to 16 years old relative to the launch of *Operation Intolerance*.

are primarily driven by the target cohorts rather than the subsequent ones. This underscores again the importance of having been born prior to the *Operation Intolerance* broadcasts to experience these effects.

Overall, these results suggest a shift in favor of civil disobedience and non-violence, which are key tenets of the Civil Rights Movement. We corroborate these findings on attitudes by examining a behavioral outcome—participation in the Vietnam War. In line with the results on attitudes, column (6) reveals that the broadcast led to a significant reduction in participation among the target cohorts. In this group, we find a reduction of 0.02 percentage points in participation in counties fully covered by the broadcast, compared to those with no coverage. Appendix Figure D21 shows how estimates vary by cohort using equation (2). The reduction is primarily observed in individuals who were at least 4 years old in 1946. We observe no significant effect in younger individuals or those not yet born in 1946.

Table 3: Cohort study estimates of the effect on dissent and institutional trust

	Dissent		Institutional Trust			Vietnam War participation (6)
	Approve of... protests (1)	Approve of... demonstrations (2)	Trust in the government (3)	Favorable towards the... police (4)	Favorable towards the... military (5)	
A. All cohorts						
Target × Exposure	0.253** (0.097)	0.171 (0.111)	-0.084 (0.061)	-0.290*** (0.087)	-0.166** (0.075)	-0.015*** (0.004)
R ²	0.20	0.18	0.18	0.15	0.19	0.72
Observations	4,253	5,481	9,777	6,405	7,333	68,134
B. Exclude younger cohorts						
Target × Exposure	0.297** (0.115)	0.202* (0.119)	-0.092 (0.070)	-0.297*** (0.092)	-0.164* (0.087)	-
R ²	0.20	0.19	0.21	0.14	0.16	-
Observations	3,331	4,125	7,235	5,025	5,587	-

Note. Estimates based on equation (2), grouping target cohorts into a single cohort. *Target* is an indicator variable set to 1 for respondents aged 3–17 in 1946, and *exposure* measures the share of the county population covered by the radio signal of *Operation Intolerance* in 1946. All specifications include controls for targeted coverage, state-by-year fixed effects, time effects, and individual controls (see Section 4). Panel A includes all available cohorts, while panel B excludes younger cohorts. Standard errors, clustered by county, are reported in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01). The dependent variables in columns (1)–(5), denoted by the column headers, are z-scores of the following variables: (1) *approve of protests* is the degree of approval of participation in protests, ranging from 1 (disapprove) to 3 (approve); (2) *approve of demonstrations* is the degree of approval of participation in demonstrations, ranging from 1 (disapprove) to 3 (approve); (3) *trust in the government* is the degree of trust in the federal government doing the right thing, ranging from 1 (never) to 4 (always); (4) *favorable towards the police* measures the feelings towards police, ranging from 1 (unfavorable) to 100 (favorable); (5) *favorable towards the military* measures the feelings towards the military, ranging from 1 (unfavorable) to 100 (favorable). The dependent variable is column (6), *Vietnam War participation*, represents the cohort-specific share of deaths assigned to each county based on the birthplace of the deceased (multiplied by 100). Descriptive statistics and temporal coverage for variables in columns (1)–(5) are presented in Appendix C.1, and for column (6) in Appendix C.3.

5.4 Political change and public opinion

Results discussed in Sections 5.1–5.3 suggest that *Operation Intolerance* provided an important contribution to the support of the Civil Rights Movement in the 1960s and 1970s, creating support for civil rights and shaping social attitudes in favor of civil disobedience. In this section, we aim to determine whether the broadcast led to society-wide changes in political attitudes and mobilization, particularly making target cohorts more progressive on issues related to civil rights. Table 4 presents estimates of political attitudes in columns (1) and (2), on voting behavior in column (3), and on mobilization in columns (4) and (5).

Columns (1) and (2) concentrate on cohort study estimates of self-reported political attitudes using equation (2) and grouping target cohorts into a single group. Appendix D.1 provides estimates using equation (2) without grouping cohorts. Panel A provides estimates using all available cohorts in the data, while panel B excludes younger cohorts.

Column (1) examines the Conservative–Liberal Scale, which assesses a respondent’s progressiveness, while column (2) assesses respondents’ favorable feelings towards Republicans, who represented more conservative views on civil rights issues at the time of the survey. We observe that *Operation Intolerance* caused target cohorts to become more progressive and less supportive of Republicans. In counties fully covered by the broadcast, target cohorts experienced an increase of 0.27 standard deviations towards progressiveness on the Conservative–Liberal Scale and a decrease of 0.18 standard deviations in support for Republicans. Estimates remain comparable when excluding younger cohorts from the cohort study specification, underscoring the importance of experiencing *Operation Intolerance* firsthand. In this subset, the coefficients for progressiveness and support for Republicans are 0.33 and -0.18, respectively.

To complement these results based on the cohort study specification, in columns (3) to (6), we shift our focus to county-level outcomes and present event study estimates using equation (3), pooling all post-1946 observations. Figure 7 illustrates the corresponding estimates using equation (3) and visualizing how the event study estimates evolve over time.

Column (3) specifically focuses on voting behavior, using the measure of voting in support of segregation in the Deep South (see Section 3.6). Our findings consistently indicate a reduction in the vote share for pro-segregation candidates, with the effect in the post-1946 period amounting to a decrease of 4.9 percentage points. Panel A in Figure 7 shows no systematic differences between counties that were covered by the broadcast in 1946 and those that were not, prior to the programming shift. Because these estimates

are not based on cohort comparisons, we interpret these direct effects within the context of agenda-setting in the broader media landscape. This perspective suggests that the impact of the broadcast extended far beyond its initial target group, aligning with the broader societal changes in the counties covered in 1946. As the directly targeted group of young adults reached voting age in subsequent elections, their influence potentially contributed to further reducing the electoral success of segregationist candidates.

To complement this result, in Appendix D.6, we focus on voting for pro-segregation presidential candidates. We focus on two presidential candidates with clear pro-segregation profiles and programs. These are Strom Thurmond in 1948 and George Wallace in 1968. Both candidates ran for Presidential elections only in the post-broadcast period, and we therefore can only compare the changes in votes from 1948 to 1968 in counties covered by *Operation Intolerance* in 1946 versus those not covered, interpreting a significant difference as indicative of a progressive movement away or towards segregationist politicians when more cohorts targeted by *Operation Intolerance* enter voting age.²⁸ From 1948 to 1968, counties covered by *Operation Intolerance* in 1946 experience a reduction in the vote share for a segregationist candidate by 5.1 percentage points compared to the counties that were not covered. This estimate increases to 6.2 percentage points if we restrict the sample to Southern states.²⁹

Finally, in columns (5) and (6), we focus on mobilization by estimating the effects on the likelihood of a county having an active branch of the KKK or the NAACP. These estimates are based on equation (3), grouping all post-1946 periods, thus comparing counties covered by the broadcast in 1946 to those that were not, over time. Generally, the last data point before 1946 serves as the reference point for the estimates.

In the post-broadcast period, in counties where 100% of the population was covered by the signal of *Operation Intolerance*, we observe a significant reduction of 7.5 percentage points in the probability of having an active KKK chapter. Consistent with this result, we also observe a significant increase of 6.6 percentage points in the probability of a county having a NAACP branch. Panel B of Figure 7 illustrates the temporal evolution of these effects by providing estimates from equation (3) at each data point. The effects on the presence of both KKK chapters and NAACP branches are persistent and increasing over

²⁸In the 1948 Presidential elections, Strom Thurmond ran as a third-party candidate for the States' Rights Democratic Party (or *Dixiecrats*), which was formed in response to the increasing support of the Democratic Party for civil rights. The political program of Thurmond centered around racial segregation, advocating for the preservation of Jim Crow laws in the Southern states. In 1968, George Wallace ran as a third-party candidate for the American Independent Party, with a populist program and a political history of strong opposition of desegregation (see Section 3.2). Refer to Mieczkowski (2020) for an overview of these elections.

²⁹Appendix D.6 discusses the effects of *Operation Intolerance* on aggregate electoral outcomes. Using equation (3) to estimate impacts, we show that in the period from 1948 to 1972, counties that were covered by *Operation Intolerance* in 1946 tended to have a higher share of votes for the Democratic Party (compared to the Republican Party), while we do not observe any difference in the pre-broadcast period (1932–1944).

Table 4: Political outcomes and mobilization

	Political attitudes		Support for segregation (3)	Mobilization	
	Conservative–Liberal Scale (1)	Support for Republicans (2)		KKK (4)	NAACP (5)
A. Cohort study – All cohorts					
Target × Exposure	0.273*** (0.085)	-0.183** (0.081)			
R ²	0.14	0.16			
Observations	7,377	8,088			
B. Cohort study – exclude younger cohorts					
Target × Exposure	0.330*** (0.090)	-0.180* (0.094)			
R ²	0.16	0.17			
Observations	5,742	6,340			
C. Event study					
Post 1946 × Exposure			-0.049*** (0.013)	-0.074*** (0.032)	0.078*** (0.023)
R ²			0.76	0.64	0.65
Observations			22,824	15,485	12,388

Note. In Panels A and B, estimates are based on equation (2), grouping target cohorts into a single cohort. *Target* is an indicator variable set to 1 for respondents aged 3–17 in 1946, and *exposure* measures the share of the county population covered by the radio signal of *Operation Intolerance* in 1946. Panel A includes all available cohorts, while panel B excludes younger cohorts. In Panel C, estimates are based on equation (3), pooling all post-1946 observations. All specifications include controls for targeted coverage, state-by-year fixed effects, time effects, and individual controls (see Section 4). *Post 1946* is an indicator variable set to 1 for observations after 1946. Standard errors, clustered by county, are reported in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01). The dependent variables in columns (1) and (2), detailed in the column headers, are the z-scores of the following variables: (1) *Conservative–Liberal Scale* measures political preferences, ranging from 1 (most conservative) to 100 (most liberal); (2) *support for Republicans* measures the feelings towards Republicans, ranging from 1 (favorable) to 100 (unfavorable). The dependent variable in column (3), *Support for segregation* measures the share of votes to pro-segregation candidates in local elections in the Deep South (see Section 3.3 for details). The dependent variables in columns (4) and (5) refer to mobilization: (4) *KKK* is an indicator variable equal to 1 if the county has at least one KKK chapter at time t, and 0 otherwise; (5) *NAACP* is an indicator variable equal to 1 if the county has at least one NAACP branch at time t, and 0 otherwise. Additional details about the variables are presented in Appendix C.1.

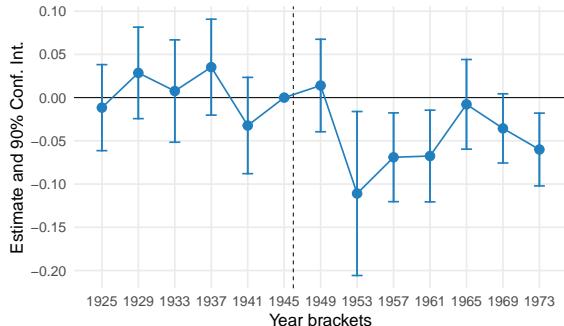
time. In 2020, 74 years after the broadcast of *Operation Intolerance*, counties that were covered by the broadcast are roughly 10 percentage points less likely to have an active KKK chapter and 10 percentage points more likely to have an active NAACP branch compared to counties that were not covered. Before the launch of *Operation Intolerance*, there were no significant differences between these areas in terms of the presence of KKK chapters or NAACP branches.

While estimates suggest that coverage of *Operation Intolerance* promoted more liberal attitudes toward civil rights among both target cohorts and counties, we aim to ascertain whether a tolerant, pro-civil-rights narrative was already prevalent in public discourse before 1946. For this purpose, we examine newspaper coverage of civil rights issues using the Civil Rights Narrative measure (discussed in Section 3.5), which quantifies the salience of civil rights topics in newspapers.

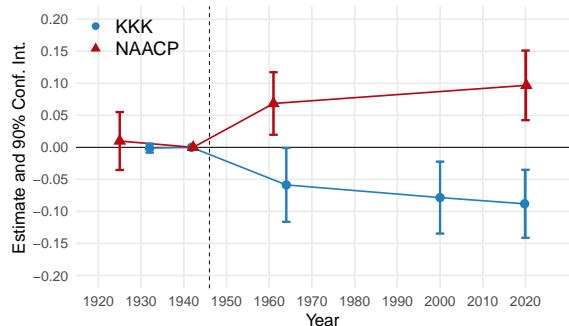
Figure 8 plots event study estimates from equation (3). Appendix D.5.2 provides descriptive statistics,

Figure 7: The effect on support for segregation and on mobilization

A. Support for segregation



B. Mobilization

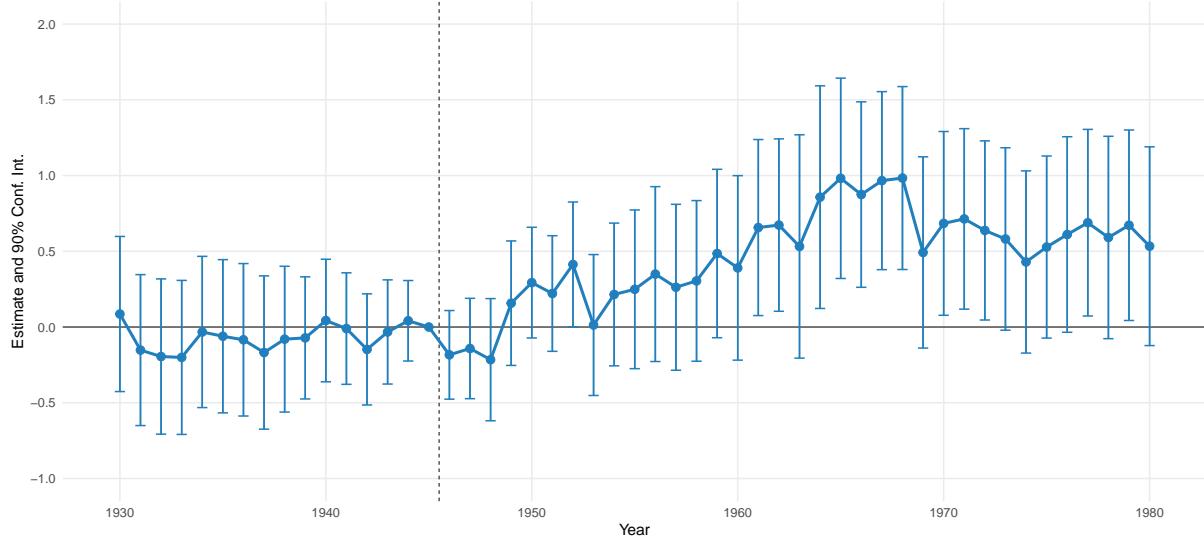


Note. Estimates based on equation (3). Confidence intervals at the 90% of confidence level are obtained from standard errors clustered at the county level. In panel A, the dependent variable is the share of votes to pro-segregation candidates in the Deep South. The procedure to compute this measure is described in Section 3.6. The sample is restricted to counties in the Deep South. In panel B, the dependent variables are *KKK*, an indicator variable equal to 1 if the county has at least one KKK chapter at time t , and 0 otherwise; and *NAACP*, an indicator variable equal to 1 if the county has at least one NAACP branch at time t , and 0 otherwise. Additional details about the variables are presented in Appendix C.1.

and Appendix Table D11 shows estimates across various specifications of equation (3) pooling post-1946 observations. Newspapers discussed themes related to civil rights throughout the period 1930–1980, but most notably during the 1960s, at the height of the Civil Rights Movement. Newspapers published in counties not covered by *Operation Intolerance* in 1946 tend to have a lower Civil Rights Narrative throughout the period, indicating that areas covered by the signal were indeed more tolerant throughout the period of analysis. However, both covered and not covered counties follow a parallel trend with respect to Civil Rights Narrative.

Beginning in the 1960s, counties where *Operation Intolerance* covered 100% of the population in 1946 started exhibiting a significantly higher prominence of civil rights issues in local newspapers compared to those not covered by the broadcast. These effects diminish and become insignificant by the end of the 1970s. The effect for the post-1946 period corresponds to an increase of 0.53 standard deviations in Civil Rights Narrative, mostly concentrated in the post-1955 period, during which we observe an increase by 0.67 standard deviations. The year 1955 is central in the history of the Civil Rights Movement due to the arrest of Rosa Parks and the Montgomery Bus Boycott. We do not observe any significant differences in the period before 1946. This suggests that the influence of *Operation Intolerance* became a distinguishing factor in the visibility of civil rights issues post-1946, but only at the peak of the Civil Rights Movement.

Figure 8: Civil rights narrative in local newspapers



Note. Estimates based on equation (3). Confidence intervals at the 90% confidence level are obtained from standard errors clustered at the county level. The dependent variable is the *Civil Rights Narrative* measure, defined by the first principal component of the salience of civil rights-related themes in local newspapers (see Section 3.5 for details on the construction of this measure). The sample is restricted to counties where newspaper data are available for more than 70% of the observations in the period 1930–1980. Estimates and robustness checks for alternative procedures used to build the salience measure are presented in Appendix D.5.2.

6 Conclusion

The oppressive and abhorrent practice of slavery was legally abolished in 1865. However, racist attitudes toward and exclusion of African Americans have persisted over time. More broadly, minoritized communities around the world also confront deeply engrained prejudice as they seek equality. Racist depictions of minorities in films and popular media during the 20th century have often exacerbated these discriminatory attitudes. This paper demonstrates that media can also serve as a powerful antidote to such venom. By examining the remarkable experiment that used the popular children’s radio program *The Adventures of Superman* to foster tolerant attitudes in the 1940s, we provide evidence that mass media can be effective at combating intolerance. The success of this operation not only fostered a generation more supportive of civil rights but also laid the groundwork for significant social and political changes, contributing to the civil rights advancements of the 1960s.

While our study draws from the post-war era in the U.S., it offers several key insights for contemporary policy. Firstly, it demonstrates that media interventions can be powerful tools in combating racial prejudice. Just as *Operation Intolerance* used the radio to reach millions of young listeners, modern campaigns can leverage digital media platforms to spread messages of equality and counteract misinformation and hate-based content. This is a crucial priority, given the evidence highlighting the role of

social media in spreading hatred toward minorities ([Bursztyn et al., 2019](#)).

Secondly, our study highlights the importance of targeting young generations. Early exposure to progressive narratives can have long-lasting effects, fostering a more tolerant and equitable society in the future. Inclusive media programming should be prioritized and supported by policymakers to ensure that young people are equipped with tolerant values.

Lastly, by linking support for civil rights to increased dissent and mistrust of some public institutions, we show that changes in social narratives can not only foster greater preferences for inclusion, but also shift individual political preferences. This finding is particularly relevant to contemporary social movements that combat racial inequality, such as the Black Lives Matter movement. The decline in institutional trust observed in our study aligns with current calls for policing reforms and enhanced oversight of law enforcement agencies to address systemic racism and ensure justice.

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ONLINE 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

We reconstruct historical broadcast exposure from three different data sources. Firstly, we retrieve information from the 1947 Broadcasting Yearbook, identifying Kellogg Company as sponsor of *The Adventures of Superman* and the precise broadcasting schedule in 1946 (Figure A1). The 1945 publication of Standard Rate and data service (SRDS) holds detailed information on sales of advertising slots for the subsequent year, including the list of stations constituting the packaged advertising group on the Mutual network (see Figure A2 for an extract). Finally, drawing on the Radio Annual publication from 1946 we collect data on the precise location and transmitter specifications of the complete 1946 U.S. radio network. Figure A3 shows an example of information it contains. Figure A4 shows the map of effective ground conductivity based on the original publication of the Federal Communications Commission (FCC) in 1954 and the geographical distribution of radio antennas in 1946, used as input for our final coverage estimations presented in Section 3.1.

Figure A5 shows the expansion of the MBS network active in 1946 over the period 1920–1946. To understand how county-level characteristics explain this expansion, we identify the counties in which there is at least one MBS antenna at two points in time (1935 and 1945), and match this information with county-level demographic characteristics using census data from 1930 and 1940 from Haines et al. (2010). In Table A1, we estimate a fixed effect model at the level of the county-year, in which the dependent variable is an indicator variable equal to one if the county has an MBS antenna, and zero otherwise. We then turn our attention to the relationship between county-level characteristics in the period 1930–1940 and the radio coverage of *Operation Intolerance* in 1946. We estimate these differences using a panel regression at county level for the census characteristics in the years 1930 and 1940 on an interaction term between an indicator variable for the year 1940 and the coverage of *Operation Intolerance* in 1946, accounting for county FEs and state-by-year FEs. A statistically significant coefficient on the interaction terms indicates that the expansion on MBS before the 1940s targeted the corresponding characteristic. Table A2 presents the results.

Figure A1: Example of information digitized from the Broadcasting Yearbook

ADVERTISERS USING MUTUAL NETWORK DURING 1946 (Continued)						
Sponsor	Product	Program	Time	No. of Stations	Duration of Contract	Agency & City
General Motors Corp., Detroit	Institutional	Your Land and Mine with Henry J. Taylor	Mon., Fri., 10:00-10:15 P.M. eff 4/1/46 Mon., Fri., 7:30-7:45 P.M.	809	12/21/46—	Kudner Agency, Detroit
Gillette Safety Razor Co., Boston	Safety Razors and Blades	World Series	1:15 P.M. to conc.	424	10/6, 7, 10, 11, 18,	Maxon Inc., N. Y.
		Cotton Bowl Game	2:00 P.M. to conc.	236	1/1/46 only	
		East-West Football Game	4:45 P.M. to conc.	250	1/1/46 only	
		All-Star Baseball Game	1:15 P.M. to conc.	290	7/9/46 only	
Gospel Broadcasting Assn. (eff 11/8/46 Dr. Fuller Foundations)	Evangelical Talks	Pilgrim Hour	Sun., 12:00-12:30 P.M.	185	9/6/42—	R. H. Alber Co., Los Angeles
Grove Laboratories Inc., St. Louis	Four Way Cold Tablets, B-Complex Vitamins	The Shadow	Sun., 5:00-5:30 P.M.	51	9/9/45-8/3/46	Russell M. Seeds Co., Chicago
Gum Laboratories Inc.	Ivoryne Chewing Gum	Sweetheart Time eff 6/16/46 Singing Sweethearts	Sun., 1:30-2:00 P.M. Sun., 1:30-1:45 P.M. eff 12/8/46 Sun., 8:45-9:00 P.M.	94	8/18/45-12/8/46	McJunkin Advertising, Chicago eff 11/1/45 McAlpin Assoc., N. Y.
Hastings Manufacturing Co., Hastings, Mich.	Piston Rings	Michael Shayne	Tues., 8:00-8:30 P.M.	307	10/22/46—	Keeling & Co., Indianapolis
Heibros Watch Co., New York	Watches	Pick and Pat Times eff 1/10/46 Quick As A Flash eff 6/10/45 The Abbott Mysteries eff 9/9/45 Quick As A Flash eff 6/9/46 The Abbott Mysteries eff 9/8/46 Quick As A Flash	Tues., 8:30-9:00 P.M. Sun., 6:00-6:30 P.M.	300	1/18/44—	Wm. H. Weintraub & Co., N. Y.
Horwitz & Duberman, New York	Junior Miss Fashion Products	Judy 'N Jill 'N Johnny	Sat., 12:00-12:30 P.M.	58	10/12/46—	Sterling Advertising Co., N. Y.
Household Finance Corp., Chicago	Finance Service	Square With the World	Thurs., 9:30-10:00 P.M.	6	11/29/45-2/21/46	BBDO Inc., Chicago
Ice Capades	Ice Capades	Ice Capades	Wed., 10:15-10:30 P.M.	2	9/4/46 only	Smith, Bull, McCrorey, N. Y.
I. J. Fox, New York	Institutional	I. J. Fox Testimonial Dinner	Thurs., 10:00-10:30 P.M.	4	6/6/46 only	Peek Advertising Agency Inc., N. Y.
Kellogg Company, Battle Creek	Kellogg's Pep	Superman	Mon.-Fri., 5:45-6:00 P.M., local eff 7/4/44 Tues., Thurs., 6:45-6:00 P.M., local eff 1/18/45 Tues., Fri., 5:15-5:30 P.M., local	220	1/4/48-9/28/44 1/15/45—	Kenyon & Eckhardt, N. Y.

Note. Extract from the 1947 Broadcasting Yearbook identifying Kellogg Company as sponsor of *The Adventures of Superman*, with broadcasting schedule in 1946.

Figure A2: Example of information digitized from Standard Rate and Data Service (SRDS) publication

MUTUAL BROADCASTING SYSTEM

Tribune Tower, Chicago, Ill., Whitehall 5060.
Sales Office—1440 Broadway, New York City, Pennsylvania 6-9800.

Rates effective July 15, 1944. (Card No. 13.)
Card revised March 15, 1945.

Agency Commission

15% is allowed recognized agencies on all network station time charges (after all discounts and rebates are deducted).

Terms of payment: 2 points of each discount earned by the advertiser are contingent upon full payment of bills on or before 20th day of month following the month in which the broadcast occurred.

General Advertising

MUTUAL NETWORK RATE CLASSIFICATIONS

Units of Time

Rates for all time periods (based on the gross evening hour rate) according to this table: % of Evening: br. rate
45 minutes..... 80%
30 minutes..... 60%
15 minutes..... 40%

Daytime rates for these units are exactly half the evening cost, except where noted under Time Classifications below.

Time Classifications

6:00 p.m. to 10:30 p.m. nightly.....	Full evening rate
10:30 p.m. to 11:00 p.m. nightly.....	2/3 evening rate
11:00 p.m. to 12:00 mid. nightly.....	1/2 evening rate
12:00 mid. to 8:00 a.m. daily.....	1/3 evening rate
8:00 a.m. to 6:00 p.m. week days.....	daytime rate
8:00 a.m. to 12:00 noon Sunday.....	1/2 evening rate
12:00 noon to 6:00 p.m. Sunday.....	2/3 evening rate

All classifications are based on local time.
Service available to advertisers only if a regularly scheduled program precedes or follows.

Network advertisers whose actual gross billings within a 52 week period are 1,200,000.00 or more earn maximum discounts on all facilities used.

Maximum Discounts

Basic Group	50%
Basic Supplementary Group.....	50%
Special Supplementary Group.....	60%

BASIC GROUP

Basic Network qualifying for "Required Basic" discounts consists of all 38 stations in basic group plus 7 Yankee stations and a minimum of any 16 supplementary stations from the groups other than the basic.

GROSS COST PER BROADCAST

(Evening)

	1 hr.	1/2 hr.	1/4 hr.
*Akron (WHKK)	130.00	72.00	48.00
Baltimore (WFBR)	300.00	180.00	120.00
Boston (WNAC)	440.00	264.00	176.00
Bridgeport (WICC)	160.00	96.00	64.00
Buffalo, N. Y. (WEBR)....	175.00	105.00	70.00
Canton (WHBC)	150.00	90.00	60.00
Chicago, Ill. (WGN).....	800.00	480.00	320.00
†Cincinnati (WKRC)	340.00	204.00	138.00
†Cleveland (WHK)	340.00	204.00	136.00
†Columbus (WHKC)	130.00	78.00	52.00
Denver (KFEL)	200.00	120.00	80.00
Detroit-Windsor (CKLW)....	320.00	192.00	128.00
Fresno (KFRE)	100.00	60.00	40.00
§Hartford (WTHT)	120.00	72.00	48.00
Indianapolis (WIBC)	220.00	132.00	88.00
†Kansas City, Mo. (WHE)	240.00	144.00	96.00
†Kansas City, Kan. (KCRN)			
Los Angeles (KHJ)	375.00	225.00	150.00
Louisville (WGRC)	125.00	75.00	50.00
Minn.-St. Paul (WLOL)	200.00	120.00	80.00
New York (WOR)	1200.00	720.00	480.00
Omaha (KBON)	110.00	66.00	44.00
Fremont (KORN)	Bonus with KBON in option time		
Philadelphia (WIP)	390.00	234.00	156.00

Note. Extract from the May 1945 Standard Rate and Data Service (SRDS) publication allowing to identify the precise composition of broadcasting network of *The Adventures of Superman* in 1946.

Figure A3: Example of information digitized from the 1946 Radio Annual

MISSOURI

For Major Markets—Radio Homes 1946 Please Turn to Pages 247-255

K F V S

CAPE GIRARDEAU—EST. 1925

Frequency: 1400 Kc.....	Power: 250 Watts
Owned By.....	Oscar C. Hirsch
Operated By.....	Oscar C. Hirsch
Address.....	324 Broadway
Phone Number.....	2104. 2105
Transmitter Location.....	3½ miles west of Cape Girardeau on Highway No. 61
Time on the Air.....	Unlimited
News Service.....	UP
Transcription Service.....	Standard Radio
Representative.....	John E. Pearson

Personnel

President-General Manager.....	Oscar C. Hirsch
Station-Sales Manager.....	Ralph L. Hirsch
Production-Program Director.....	Virginia Bahn
Chief Engineer.....	R. L. Hirsch
Promotion-Publicity.....	R. L. Hirsch

•

K F R U

COLUMBIA—EST. 1925

ABC

Frequency: 1400 Kc.....	Power: 250 Watts
Owned By.....	KFRU, Inc.
Address.....	Ninth and Elm Sts.
Phone Number.....	4141
Transmitter Location.....	Hickman Hall, Stephens College
Time on the Air.....	6:30 a.m. to 11 p.m.
Newspaper Affiliation.....	Star Times Publishing Company, St. Louis
News Service.....	AP & UP
Transcription Service.....	NBC Thesaurus
Representative.....	John Blair & Co.

Personnel

President.....	Elzey Roberts
General Manager.....	Mahlon Aldridge
Program Director.....	Harold Douglas
Musical Director.....	Dorothy Jacques
Chief Engineer.....	Robert Haigh
Record M. C.....	Dorothy Jacques

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K H M O

HANNIBAL—EST. 1941

MUTUAL

Frequency: 1340 Kc.....	Power: 250 Watts
Owned-Operated By.....	Courier Post Publishing Co.
Address.....	102½ S. Main St.
Phone Number.....	3450-51
Transmitter Location.....	Lindell Ave.

Time on the Air.....	5:30 a.m. to 12 midnight; Sundays, 8 a.m. to 12 midnight
Newspaper Affiliation.....	Hannibal Courier Post
News Service.....	AP
Transcription Service.....	NBC & Cole
Representative.....	John E. Pearson Co.

Personnel

General Manager-Sales Promotion Manager.....	Wayne W. Cribb
Commercial Manager.....	Chris Jensen
Program-Musical Director.....	Dud Dawson
Production Manager.....	Maxine Dierking
Publicity Director-Record M. C.....	Gene Hoenes
Chief Announcer.....	Bob McCoy
Chief Engineer.....	Ben Parrish

•

K W O S

JEFFERSON CITY—EST. 1936

MUTUAL BROADCASTING SYSTEM

Frequency: 1240 Kc.....	Power: 250 Watts
Owned-Operated By.....	Tribune Printing Co.
Business Address.....	210 Monroe
Phone Number.....	4000
Studio Address.....	210 Monroe
Transmitter Location.....	St. Mary's Blvd.
Time on the Air.....	6 a.m. to midnight
Newspaper Affiliation.....	Jefferson City Capitol News & Post Tribune
News Service.....	AP
Transcription Service.....	Lang-Worth
Representative.....	Sears & Ayer

Personnel

President.....	R. C. Goshorn
General Manager.....	R. L. Rose
Station Manager.....	R. L. Rose
Commercial Manager.....	R. L. Rose
Sales Promotion Manager-Publicity Director.....	Natalie LePage
Program Director.....	Ray Manning
Chief Engineer.....	Harold White

•

W M B H

JOPLIN—EST. 1933

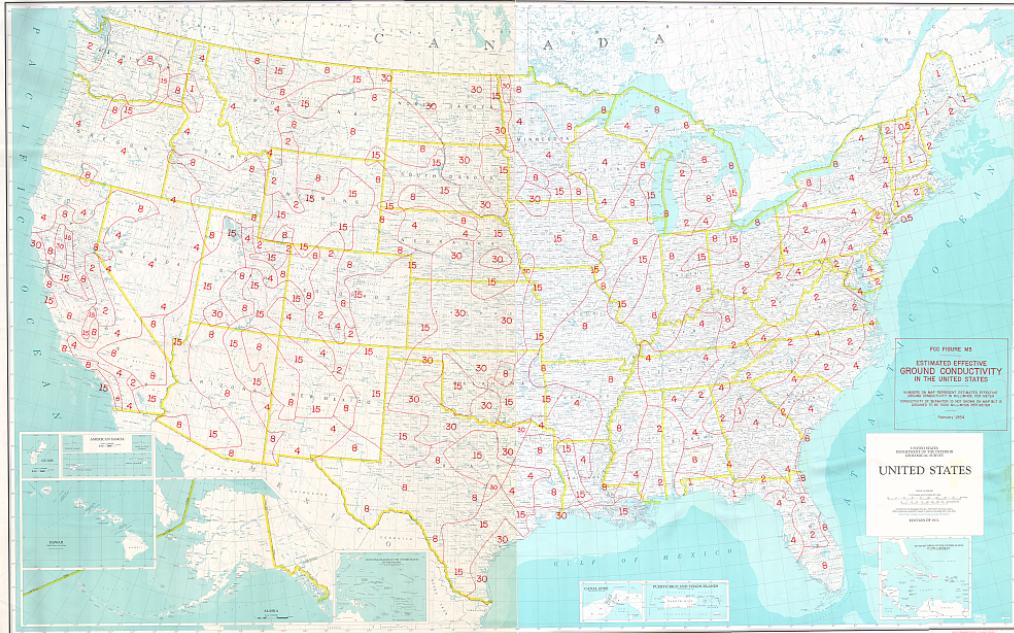
MUTUAL BROADCASTING SYSTEM

Frequency: 1450 Kc.....	Power: 250 Watts
Owned-Operated By.....	Joplin Broadcasting Co.
Address.....	Frisco Bldg. Sixth and Main Sts.
Phone Number.....	330
Transmitter Location.....	1334 Roosevelt Ave.
Time on the Air.....	6 a.m. to midnight
Newspaper Affiliation.....	Joplin Globe Publishing Co.
News Service.....	UP

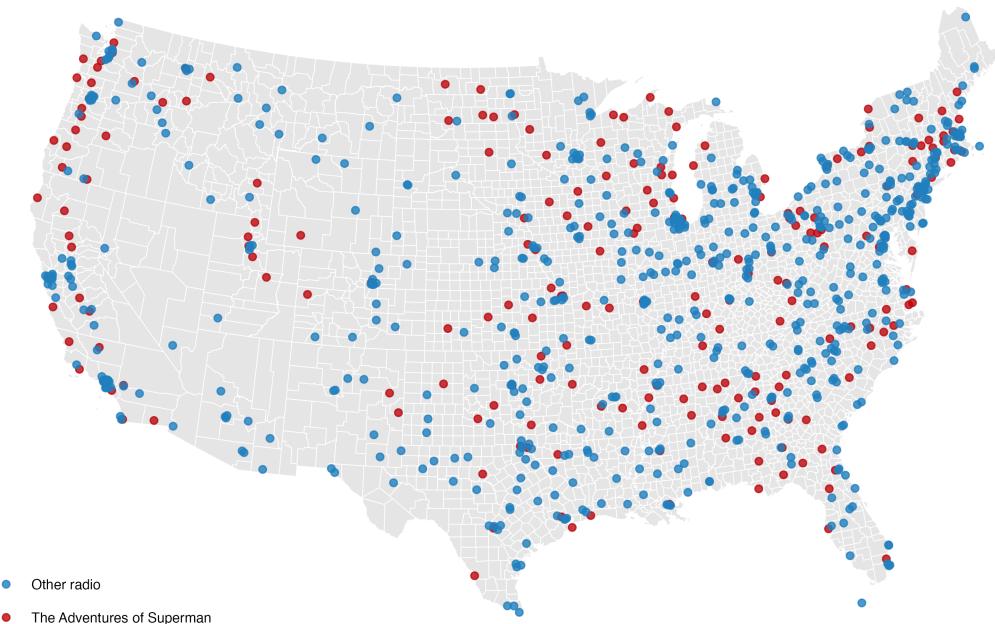
Note. Extract from the 1946 Radio Annual showing some of the active antennas in Missouri, including information on power, frequency and precise location of the transmitters. If precise location is not available we set it equal to the business address, or to the centroid of the respective county for the few remaining cases.

Figure A4: Ground conductivity and radio antennas in 1946

A. Ground conductivity

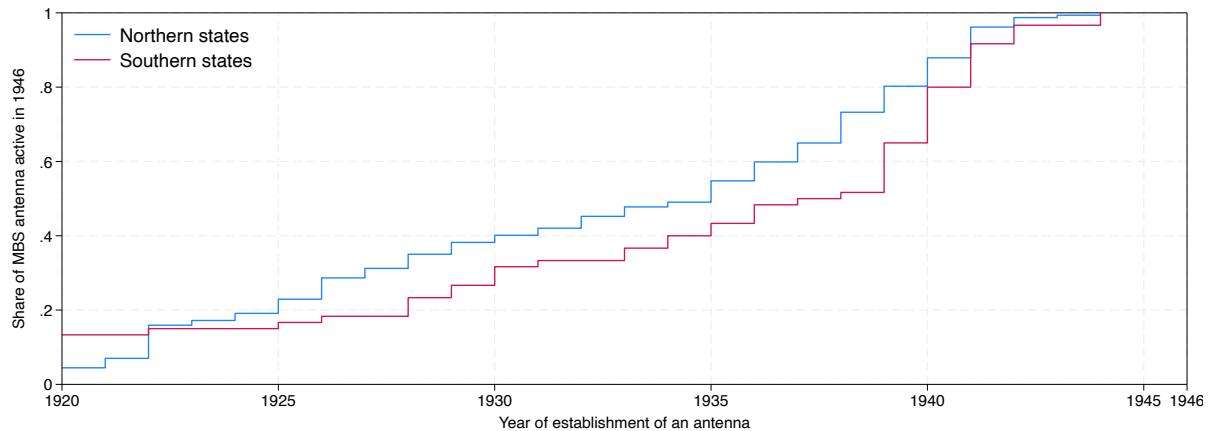


B. Distribution of radio antennas in 1946



Note. Panel A is the ground conductivity map published by the Federal Communications Commission in 1954 ([Federal Communication Commission, 1954](#)). This data is used as one of the inputs to predict the propagation of AM signals across the country. The map shows that the ground conductivity in the U.S. ranges between 0.5 and 30 millimhos (or millisiemens) per meter. Panel B shows the geographical distribution of antennas for the complete U.S. radio network of 1946. The location of antennas is geo-reference using information about the address of each transmitter, as printed in the Broadcasting Yearbook 1947. When information on the location of the transmitter is missing, we set it equal to the business address of the respective station. When the location of the transmitter and the business address of the station are both missing, we use the centroid of the county.

Figure A5: Expansion of MBS network until 1946



Note. The figure shows the distribution of MBS antennas active in 1946 by the year of establishment. Data is obtained from the Broadcasting Yearbook 1947. When the year of establishment is not available (6% of antennas), we assume the year of establishment is equal to minimum year of establishment in the sample (1920). *Southern states* are Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Texas. *Northern states* are all remaining states, excluding Alaska and Hawaii, which are excluded from the study.

Table A1: Predictors of MBS expansion

	Dep.var.: county has active MBS antenna at time $t + 5$			
	(1)	(2)	(3)	(4)
Population (per sq. mile)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
% urban population	0.000 (0.029)	-0.005 (0.029)	-0.004 (0.030)	-0.001 (0.031)
% living in city	0.005 (0.077)	0.003 (0.076)	0.003 (0.076)	-0.077** (0.036)
% male population		-0.088 (0.261)	-0.053 (0.273)	-0.049 (0.311)
% adult population		-0.304 (0.201)	-0.360* (0.205)	-0.343 (0.219)
% white population		-0.218 (0.343)	-0.266 (0.352)	-0.217 (0.397)
% white native population		0.302 (0.362)	0.363 (0.372)	0.299 (0.414)
% Black population		0.151 (0.166)	0.177 (0.164)	0.330* (0.198)
% illiterate		0.022 (0.106)	0.011 (0.109)	0.024 (0.125)
% owning a radio		0.140*** (0.038)	0.142*** (0.040)	0.126*** (0.041)
% owning their dwelling		0.071 (0.050)	0.074 (0.052)	0.064 (0.053)
% working-age population employed		0.010 (0.070)	-0.025 (0.074)	
% manufacturing establishments			-0.096 (0.072)	-0.119 (0.080)
% workers in manufacturing/commerce			0.065 (0.046)	0.070 (0.044)
Farms			-0.006 (0.021)	-0.009 (0.022)
Establishments			-0.011 (0.012)	-0.015 (0.013)
Value farms			-0.004 (0.015)	0.001 (0.017)
Value manufacturing output			0.000 (0.006)	0.000 (0.006)
Share of democratic vote				0.015 (0.022)
F-test (p-value)	0.609	0.004	0.696	0.076
Observations	6192	6192	6188	5566

Note. Census data at county level is obtained from Haines et al. (2010). For electoral outcomes corresponding to the years of the census, we use the Congressional elections in 1930 and 1940, obtained from Clubb et al. (1987). The dependent variable is an indicator variable if the county has an active MBS antenna, and 0 otherwise. Independent variables are measured at the time of the census (1930 and 1940), while the dependent variable is measured 5 years ahead in 1935 and 1945. Working-age population is the population older than 10 years old in 1930, and older than 14 years old in 1940. For employment, we consider manufacturing and commerce because these sectors were defined consistently across census rounds. The number of *farms*, *establishments* and the *value of manufacturing output* is reported in logarithms, adding one unit to account for zeros. All specifications include county FE, and state by year FE. Standard errors in parenthesis are clustered at the county level (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A2: Determinants of coverage

	Census (average)		Year 1940 · MBS radio coverage in 1946			
	1930 (1)	1940 (2)	Coeff. (3)	Std. error (4)	p-value (5)	
Population and composition						
Population (per sq. mile)	187.250	194.605	38.383	15.601	0.014	6192
% urban population	0.214	0.232	-0.006	0.004	0.159	6192
% living in city	0.059	0.061	-0.000	0.004	0.967	6192
% male population	0.517	0.513	-0.001	0.001	0.136	6192
% adult population	0.553	0.595	-0.001	0.001	0.556	6192
% white population	0.863	0.885	-0.003	0.003	0.430	6192
% white native population	0.815	0.848	0.002	0.003	0.454	6192
% Black population	0.112	0.107	0.000	0.001	0.632	6192
% other race	0.026	0.008	0.002	0.003	0.502	6192
% illiterate	0.054	0.025	0.006	0.001	0.000	6192
% owning a radio	0.258	0.675	-0.016	0.005	0.002	6192
% owning their dwelling	0.509	0.459	0.003	0.003	0.450	6192
Growth rates						
Population growth	0.198	0.065	0.074	0.101	0.467	6120
Urbanization rate	0.437	0.482	-0.144	0.166	0.385	6122
Economy						
% working-age population employed	0.480	0.431	0.001	0.003	0.743	6192
% workers in manufacturing/commerce	0.146	0.181	0.003	0.004	0.535	6192
Farms	7.287	7.248	0.007	0.021	0.742	6192
Establishments	5.515	5.659	-0.005	0.013	0.719	6192
% manufacturing establishments	0.075	0.057	-0.001	0.002	0.743	6188
Value farms	9.490	9.204	0.061	0.029	0.036	6192
Value manufacturing output	1.286	1.127	-0.040	0.043	0.351	6192
Electoral outcomes						
% votes to Democratic party	0.575	0.589	0.000	0.011	0.982	5682
% votes to Republican party	0.382	0.370	0.010	0.011	0.381	5684
Share of democratic vote	0.591	0.607	-0.002	0.011	0.885	5566

Note. Census data at county level is obtained from Haines et al. (2010). For electoral outcomes corresponding to the years of the census, we use the Congressional elections in 1930 and 1940, obtained from Clubb et al. (1987). Population growth and urbanization rate are computed as the average yearly growth rate in total population and in urban population from the previous census (e.g., growth in 1930 is the growth rate from 1920 to 1930). Working-age population is the population older than 10 years old in 1930, and older than 14 years old in 1940. For employment, we consider manufacturing and commerce because these sectors were defined consistently across census rounds. The number of farms, establishments and the value of manufacturing output is reported in logarithms, adding one unit to account for zeros. All specifications include county FE, and state by year FE. Standard errors are clustered at the county level.

B Additional information about *The Adventures of Superman*

B.1 Plot summary of exemplary story arcs

The Hate Mongers Organisation (broadcast from 16/04/1946 to 20/05/1946). Clark arrives at the hospital to find Jimmy in the waiting room. Danny O’Neil is on the Danger List, badly beaten by Muggs and Skinny, and may have a brain concussion. Father Francis Shian of Saint Mary’s Catholic Church is with Danny. Shian, Jimmy, and Clark talk with Danny, who reveals his attackers and fears for his mother’s safety. Shian explains that he met with local religious leaders and others to create Unity House, a community center for children of all backgrounds to learn and interact. However, committee members received threatening letters, and Shian believes those who sent the notes ordered Muggs to start the fire on Morton Street. Clark plans to bring down the hate mongers organization, “Guardians of America,” which opposes Unity House. Jimmy’s involvement is crucial, and he will pose as a hoodlum to join Muggs’ gang, with Superman providing protection if needed.

The Clan of the Fiery Cross (broadcast from 10/06/1946 to 01/07/1946). Tommy Lee and Chuck Riggs fight when Jimmy arrives. Chuck, upset at losing his position as the top pitcher on the Union House baseball team to Tommy, crowds the plate and gets hit by a pitch. Chuck accuses Tommy of doing it intentionally, leading to his removal from the team by Jimmy. Chuck’s uncle Matt, leader of The Clan of the Fiery Cross, exploits the situation by inviting Chuck to a secret meeting and convincing him that Tommy, an Asian American, is a threat. The Clan aims to cleanse the country of those they consider not “True Americans.”

George Latimer, Crooked Political Boss (broadcast from 03/09/1946 to 25/09/1946). Joe Martin, a war hero, joins his Jewish friend Sam Robbins in protesting Governor Frank C. Wheeler’s discriminatory hiring policies against returning war veterans. Joe suggests a more confrontational tactic, while Sam prefers a peaceful approach. Governor Wheeler, influenced by the corrupt George Latimer, incites hatred toward minorities, leading to chaos and the state police firing on protesters. Joe is shot, prompting his brother Beany, Clark Kent, and Perry White to seek justice. Clark uncovers that Latimer manipulated the police and framed Sam Robbins. Sergeant Adams’ testimony and the bullet type that struck Joe are key to clearing Sam’s name.

Knights of the White Carnation (broadcast from 26/02/1947 to 17/03/1947). In Vincent Kirby’s aristocratic home, the Knights of the White Carnation plot to remove “Un-American foreigners” from the Metropolis High School Varsity Basketball Team. Charles Canfield, who disagrees with the group’s racist agenda, plans to expose them but is mysteriously murdered. Clark Kent and Jimmy Olsen investigate, discovering that four of the five targeted players were suspended for gambling under suspicious circumstances. Clark, as Superman, saves the day by preventing a stampede at a basketball game. The coach reveals he was coerced by the chairman of the Metropolis School Board to remove the players.

B.2 Quantifying content related to tolerance and intolerance

We conducted a content analysis based on transcripts of collected audio recordings of 1019 episodes broadcast on MBS between August 1942 and February 1949. Transcripts are collected from two complementary YouTube channels specialized in the collection and distribution of historic radio programming, containing recordings of all available episodes.²

²We want to thank the maintainers of the channels “The Classic Archives Old Time Radio Channel” (@theclassicarchivesoldtimer8078) and “Nikola Tesla Wireless Radio” (@nikolateslawirelessradio) for their invaluable work in collecting and preserving these pieces of historic evidence.

This sample covers 64% of the 1592 episodes aired in the same period, while the remaining share is entirely missing. When recordings of story arcs are only partially available, we extrapolate based on the observed content of the respective story arc. We analyze transcripts using a bag-of-words approach using a list of 50 keywords returned by an AI prompt to compute the share of content in an episode covering intolerance and tolerance for racial, ethnic, and religious differences.³ We obtain the following list of keywords: acceptance, animosity, antisemitism, appreciation, bias, bigotry, chauvinism, closed-mindedness, community, compassion, cosmopolitanism, discrimination, disunity, diversity, division, dogmatism, empathy, empowerment, equality, equity, exclusion, fairness, gender equality, harmony, hate, homophobia, inclusion, individualism, inequality, injustice, integration, intolerance, justice, love, misogyny, open-mindedness, pluralism, prejudice, racism, respect, sectarianism, segregation, sexism, stereotyping, tolerance, tribalism, understanding, unity, xenophobia. Figure B6 provides a graphical depiction of the frequency of these themes in all available transcripts of *The Adventures of Superman*. To measure the share of related content per episode, we remove stop words and apply basic stemming, and compute frequencies by dividing count of keyword occurrences by the total number of words.

Figure B6: Frequency of keywords related to tolerance and intolerance



Note. Word cloud illustrating the frequency of terms related to intolerance, bigotry and prejudice. Larger and more central words reflect higher frequencies. To build the word cloud, we use a dictionary of 50 key terms related to intolerance, bigotry and prejudice (see Section B.2).

³We used ChatGPT-3.5 with the following request: “Give us a list of 50 words that are closely related to intolerance, bigotry, and prejudice, and their respective antonyms.”

B.3 Historical evidence from newspaper articles

Figures B7–B9 provide examples of coverage of *Operation Intolerance* on newspapers in 1946. Figure B10 shows examples of general coverage of Superman on radio on newspapers.

Figure B7: *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
Kenyon & Eckhardt

SUPERMAN'S 'Operation Intolerance' had its beginning at a Kenyon & 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.

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. Vanderploeg, 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, 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 afire 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 scripts 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.

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 Inc., Brooklyn, is handling conversion of General Electric radio receivers in New York area to receive stations on new frequencies. Charge is \$15. Owners of RCA and DuMont 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.

Note. The article is extracted from the edition of 13/05/1946 of the magazine *Broadcasting*. At the time of *Operation Intolerance*, William B. Lewis was the radio director at the advertising agency Kenyon & Eckhardt advertising agency and was a key promoter of linking the series (*The Adventures of Superman*) with social causes under the commercial interests of Kellogg Co. (Wall, 2009).

Figure B8: Evidence of political endorsements at the launch of *Operation Intolerance*

A. Harry S. Truman (U.S. President 1945–53)

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

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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."

B. Henry A. Wallace (U.S. Vice President 1941–45)

"Superman" Tolerance Campaign Wins Praise

The new tolerance theme recently inaugurated on the "Superman" radio series (WCLO, 5:15 p.m. Monday through Friday) has been the object of many accolades from organizations and educational groups throughout the country, including a special commendation from Secretary of Commerce Henry A. Wallace. In an effort to combat bigotry and racial prejudice, the adventures of the "man of tomorrow" have been turned from his more mythical enemies to real life foes of boys and girls the world over.

Citations and commendations have been received from the Calvin Newspaper Service, who state—"We applaud heartily this noble attempt to make better citizens of our children and to eradicate from their minds all thoughts of racial and religious intolerance," from the Associated Negro Press who commend the program and its sponsors for slanting the radio series in this vein, and from the Child Study Association of America who applaud the current Superman program.

Secretary of Commerce Wallace states—"I am happy to learn

that you are using 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."

The Real Story!

The secret is out. Mrs. Fred Van Deventer, better known to "Twenty Questions" listeners as Florence Rinard, didn't go into radio for fame and fortune, but because she wanted to see her commentator husband once in a while. "I got tired of being a golf widow by day

Note. Panel A is extracted from the edition of 14/04/1946 of The Pittsburgh Press, a newspaper published in Pittsburgh, Pennsylvania. Panel B is extracted from the edition of 11/06/1946 of the Janesville Daily Gazette, a newspaper published in Janesville, Wisconsin.

Figure B9: Evidence of post-broadcast increase in audience

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."

* * *

Note. The article is extracted from the edition of 22/05/1946 of The Akron Beacon Journal, a newspaper published in Akron, Ohio. The Hooper Ratings were a radio audience measurement system provided by the American company C. E. Hooper Company and based on surveys of listeners contacted during the shows.

Figure B10: Examples of overall presence in newspapers

A. Radio schedules

Radio Schedules		WOMI	Chain Highlights
Thursday, May 30			
7:00 News of World.	4:00 Birthday Club.	11:30 Lunchtime Tunes.	
7:05 Morning Clock.	4:15 Strictly Informal.	11:45 John J. Anthony (MBS).	
8:00 News of World.	5:00 Novelty Boys.	12:00 Cedric Foster (MBS)	
8:05 Frankie Carl.	5:15 Superman. (MBS).	12:15 Local & State News.	
8:15 Morning Devotions.	5:30 News of World.	12:20 Music For You.	
8:30 Married for Life (MBS).	5:35 Dinner Party.	12:30 Queen For A Day. (MBS).	
9:00 Music for Milady.	5:40 Baseball Summary.	1:00 Hit Tunes.	
9:15 Rev. Maurice Davis.	5:45 Tom Mix. (MBS).	1:30 Lady Be Beautiful (MBS).	
9:30 South American Way.	6:00 Fulton Lewis, Jr. (MBS).	2:00 Baptist Hour.	
9:45 Indianapolis Speedway Race (MBS).	6:15 Owensboro Today. Report.	2:30 Round Up Time.	
10:00 Lyle Van. (MBS).	6:20 Stock Market (MBS).	2:45 Mutual Melody Hour (MBS).	
10:15 Musical Album.	6:25 News of World.	3:00 News of World.	
10:30 Mustard & Gravy.	6:30 Rogue's Gallery. (MBS).	3:05 Roundup Time.	
10:45 Songs of George Byron.	7:00 Gabriel Heatter. (MBS).	3:30 Bobby McClean.	
11:00 Broadway Bandwagon.	7:15 Keepsake Time..	3:45 Smile Time (MBS).	
11:15 Indianapolis Speedway Race (MBS).	7:20 Dance Tunes.	4:00 Birthday Club.	
11:30 Stork Express.	7:30 Muzitest.	4:15 Strictly Informal.	
11:45 John J. Anthony. (MBS).	8:00 Lum 'N Abner.	5:00 Novelty Boys.	
12:00 Cedric Foster. (MBS).	8:15 Dance Tunes.	5:15 Superman (MBS).	
	8:30 Telephone Hit Parade.	5:30 News of World.	
	9:00 All the News. (MBS)	5:40 Baseball Summary.	
	9:15 Oilers vs. Cairo. (MBS).	5:45 Tom Mix (MBS).	
	10:30 News.	6:00 Fulton Lewis, Jr. (MBS).	
	10:35 Dance Hour.		

Miss Margaret Clements to go to Webster Groves, Mo., to attend graduating exercises of Webster Groves college, where her sister, Miss Lucinda Clements, is student, and will complete course. Miss Sallie May Berry, daughter of Mr. and Mrs. Henry Berry, West Second street, wins prize for essay on "What My College Means to Me," in contest embracing all colleges in state of Ohio. Is student of Sacred Heart college, Clifton, Cincinnati.

Miss Rebecca Dawson and Morton Downs married at home of Mrs. J. H. Davis, sister of bride, Rev. John A. Wray, pastor of Third Baptist church, officiating.

SUBSCRIPTIONS

MESSENGER OR INQUIRER	CITY RATES
One year in advance by carrier....	\$10.00
Daily only one year by carrier.....	7.50
Daily and Sunday per week by carrier20

B. Comic strips + elements using the word "radio"



Note. Panel A is extracted from the edition of 30/05/1946 of The Owensboro Messenger, a newspaper published in Owensboro, Kentucky. Panel B is extracted from the edition of 04/04/1946 of the Sacramento Bee, a newspaper published in Sacramento, California.

C Additional descriptive statistics

C.1 Descriptive statistics and data availability of ANES data

The following table provides definitions of the variables used from ANES surveys, including descriptives for the sample used in the main text and a reference to the survey questions. Figure C13 shows the availability of each question across different survey rounds. We consider the survey waves from 1964 to 1980, because during these waves we observe at least half of the questions used to build the support for civil rights index in each wave. Figure C12 and Figure C13 shows descriptive statistics about the variables used in the main text. For comparability, we standardize all variables with in-sample average 0 and unit standard deviation. Figure C12 focuses on the cohort-level average of the standardized variables, while Figure C13 on the average by survey wave.

Variable	Description	Mean	SD	N	ID
Main text variables					
Approve of ... demonstrations	Degree of approval of participation in demonstrations, ranging from 1 (disapprove) to 3 (approve). Demonstrations are attempts at stopping the government from going about its activities with “sit-ins, mass meetings, demonstrations.”	1.55	0.620	5481	0603
protests	Degree of approval of participation in protests, ranging from 1 (disapprove) to 3 (approve). Protests includes “protest meetings or marches that are permitted by the local authorities.”	1.72	0.718	4253	0601
Conservative–Liberal scale	Political preferences, ranging from 1 (most conservative) to 100 (most liberal). This measure is provided by ANES as a composite measure from different questions based on the Feeling Thermometer (see Section 3.2).	52.8	14.5	7377	0801
Favorable towards (the) ... Black population	Feelings towards the black population, ranging from 1 (unfavorable) to 100 (favorable). The variable is measured using the Feeling Thermometer (see Section 3.2).	62.8	21.1	8145	0206
civil rights leaders	Feelings towards civil rights leaders, ranging from 1 (unfavorable) to 100 (favorable). The variable is measured using the Feeling Thermometer (see Section 3.2).	44.7	26.6	5304	0216
military	Feelings towards the military, ranging from 1 (unfavorable) to 100 (favorable). The variable is measured using the Feeling Thermometer (see Section 3.2).	71.1	21.6	7333	0214
police	Feelings towards the police, ranging from 1 (unfavorable) to 100 (favorable). The variable is measured using the Feeling Thermometer (see Section 3.2).	76.3	18.4	6405	0214
Mixed friendships	Indicator variable equal to 1 if the respondent reports having friends of different races, and 0 if all friends share the same race.	0.409	0.492	5662	0866
Support for ... affirmative action	Beliefs over whether the government should make efforts to improve the position of Blacks, ranging from 1 (Blacks should help themselves) to 7 (Government should help Blacks).	3.61	1.89	6377	0830
Black representation	Beliefs over the influence of Blacks in American life and politics, ranging from 1 (too much influence) to 3 (too little influence).	1.98	0.785	3470	9274
desegregation	Indicator variable equal to 1 if the respondent rejects strict racial segregation.	0.864	0.342	6836	0815
integrated schools	Indicator variable equal to 1 if the respondent believes that the government should ensure racially-integrated schools.	0.45	0.498	5872	0816
Republicans	Feelings towards Republicans, ranging from 1 (favorable) to 100 (unfavorable). The variable is measured using the Feeling Thermometer (see Section 3.2). The variable has been rescaled from the original scale to have higher values representing support for civil rights.	60.6	20.7	8088	0202

(continued on next page)

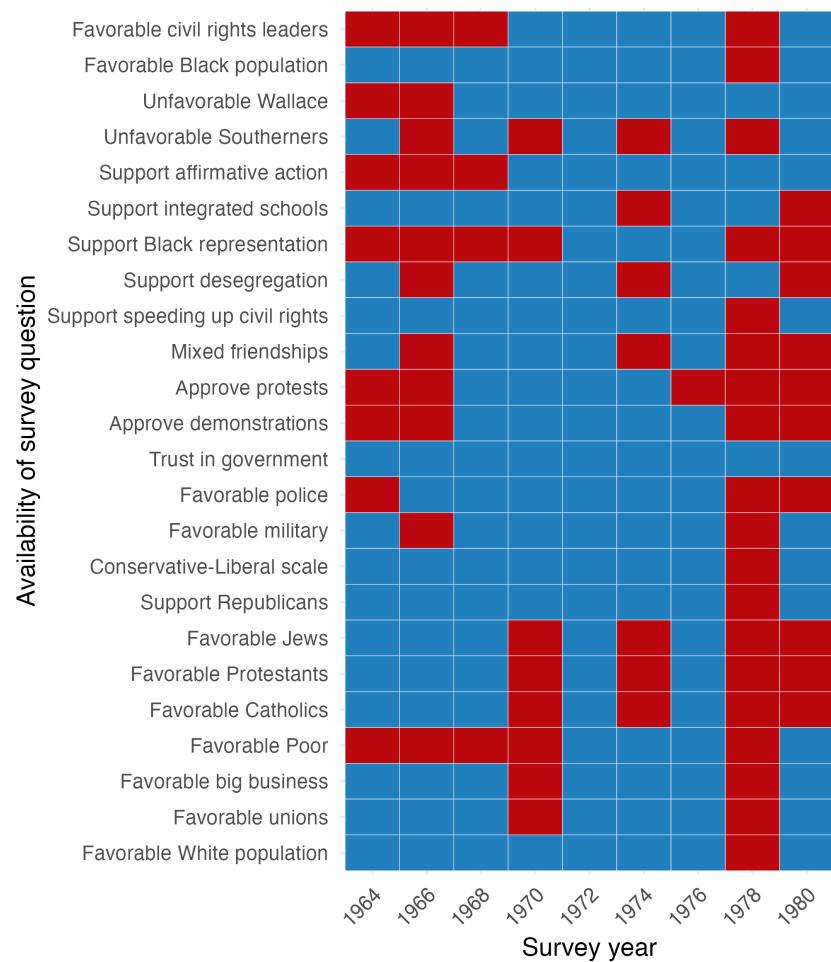
Variable	Description	Mean	SD	N	ID
speeding up civil rights	Indicator variable equal to 1 if the respondent believes that civil rights leaders are not pushing too fast for their goals.	0.469	0.499	7874	0814
Unfavorable towards ...					
George Wallace	Feelings towards George Wallace, ranging from 1 (favorable) to 100 (unfavorable). The variable is measured using the Feeling Thermometer (see Section 3.2). The variable has been rescaled from the original scale to have higher values representing support for civil rights.	52.6	28.5	8023	0439
Southerners	Feelings towards Southerners, ranging from 1 (favorable) to 100 (unfavorable). The variable is measured using the Feeling Thermometer (see Section 3.2). The variable has been rescaled from the original scale to have higher values representing support for civil rights.	33.8	20.1	5207	0208
Trust in the government	Degree of trust in the federal government doing the right thing, ranging from 1 (never) to 4 (always).	2.52	0.633	9777	0604

Appendix variables

Favorable towards (the) ...					
big businesses	Feelings towards big businesses, ranging from 1 (unfavorable) to 100 (favorable). The variable is measured using the Feeling Thermometer (see Section 3.2).	53.6	21.5	6976	0209
Catholics	Feelings towards people of Catholic religion, ranging from 1 (unfavorable) to 100 (favorable). The variable is measured using the Feeling Thermometer (see Section 3.2).	65.2	21.5	5133	0204
Jews	Feelings towards people of Jewish religion, ranging from 1 (unfavorable) to 100 (favorable). The variable is measured using the Feeling Thermometer (see Section 3.2).	62.1	19.9	5075	0205
poor people	Feelings towards poor people, ranging from 1 (unfavorable) to 100 (favorable). The variable is measured using the Feeling Thermometer (see Section 3.2).	73.5	17.3	4517	0223
Protestants	Feelings towards people of Protestant religion, ranging from 1 (unfavorable) to 100 (favorable). The variable is measured using the Feeling Thermometer (see Section 3.2).	74.6	19.1	5208	0203
Unions	Feelings towards labor unions, ranging from 1 (unfavorable) to 100 (favorable). The variable is measured using the Feeling Thermometer (see Section 3.2).	54.5	23.3	7022	0210
White population	Feelings towards the white population, ranging from 1 (unfavorable) to 100 (favorable). The variable is measured using the Feeling Thermometer (see Section 3.2).	78.8	17.7	8197	0207

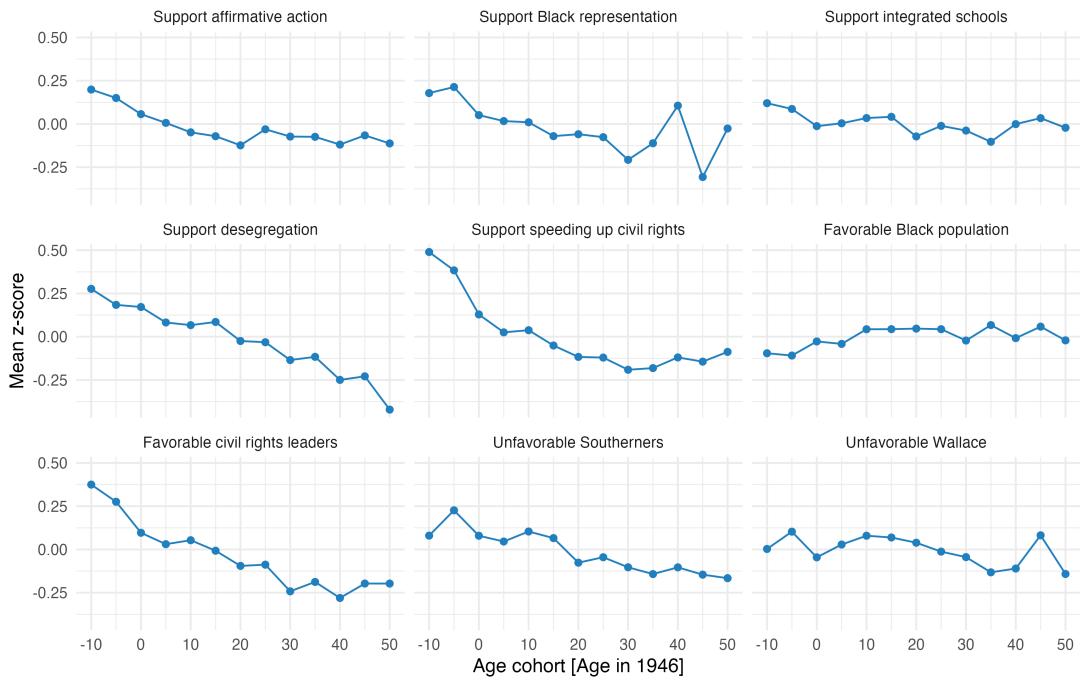
Note. ID is the ANES code of the question, starting with VCF. The scripts of questions are available from [ANES \(2021\)](#). In ANES dataset, variables measured with the feeling thermometer are top-coded at 97.

Figure C11: Data availability by year and survey item



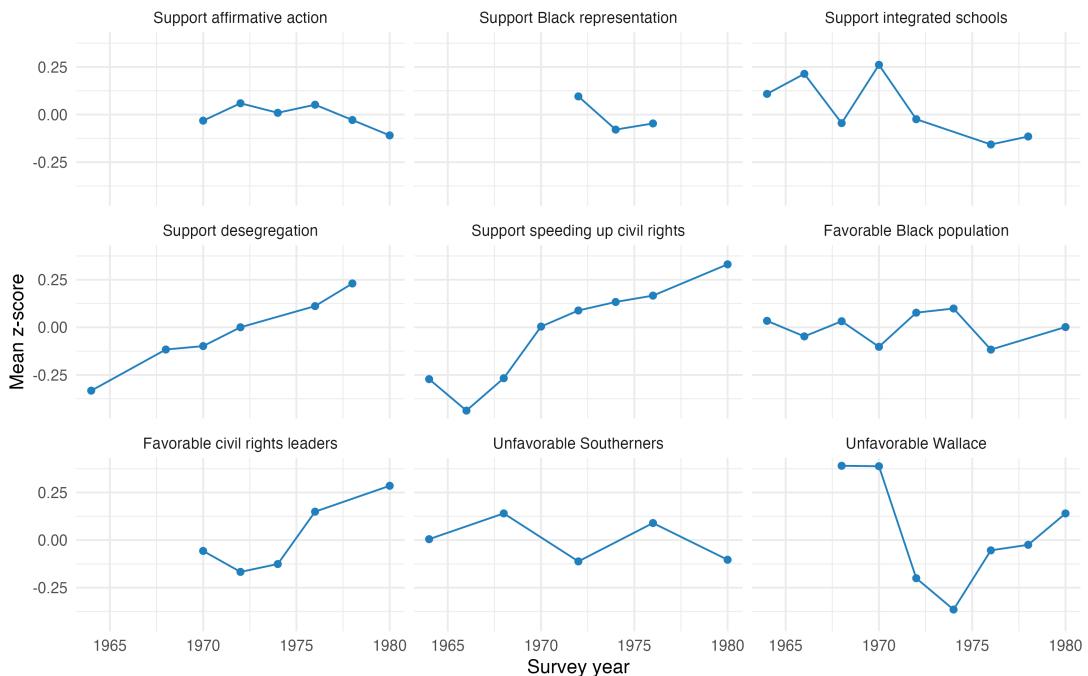
Note. The figure visualizes the availability of questions across the available set of survey waves in ANES. Blue indicates that the question was asked in the corresponding survey year.

Figure C12: Average attitudes by age cohort on civil rights related issues



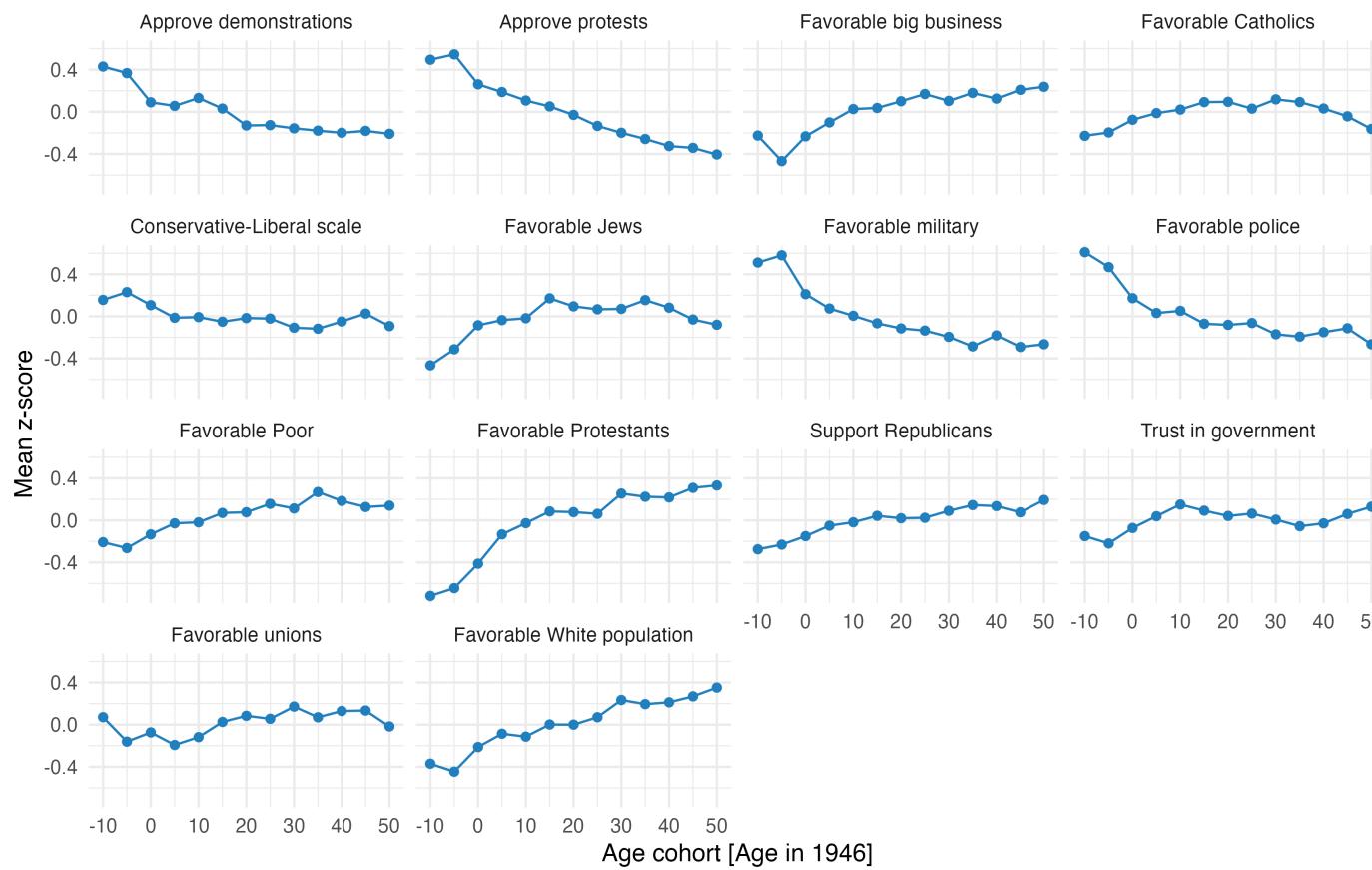
Note. The figure shows the mean attitudes by age cohort for each of the respective survey items. Age cohorts comprise 5 years and are centered around the value noted on the x-axis. Outcomes are standardized and centered at 0. Data availability for each question is reported in Appendix Figure C11.

Figure C13: Average attitudes by survey year on civil rights related issues



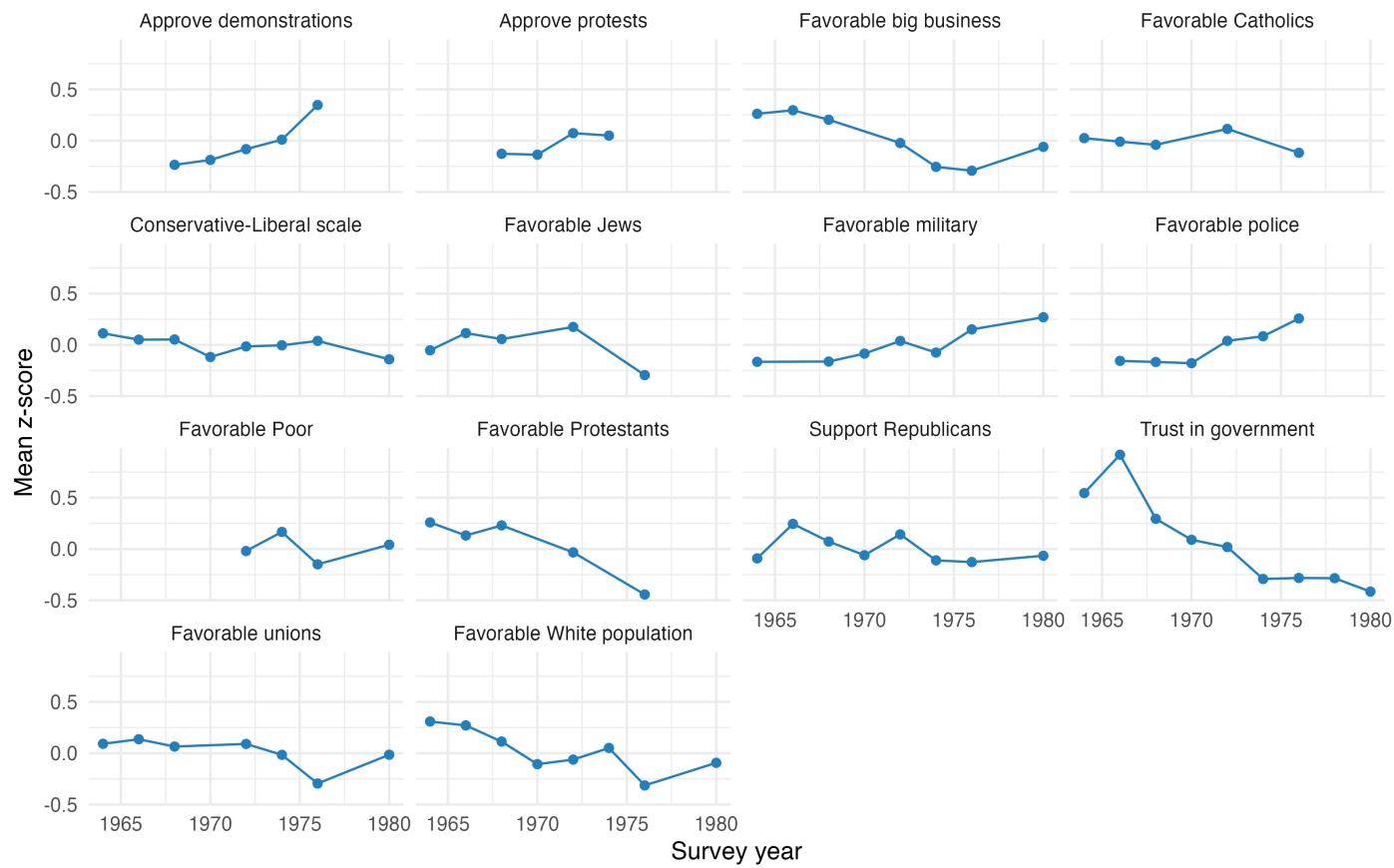
Note. The figure shows the mean attitudes by survey year for each of the respective survey items. Outcomes are standardized and centered at 0. Data availability for each question is reported in Appendix Figure C11.

Figure C14: Average attitudes by age cohort on other issues



Note. The figure shows the mean attitudes by age cohort for each of the respective survey items. Age cohorts comprise 5 years and are centered around the value noted on the x-axis. Outcomes are standardized and centered at 0. Data availability for each question is reported in Appendix Figure C11.

Figure C15: Average attitudes by survey year on other issues

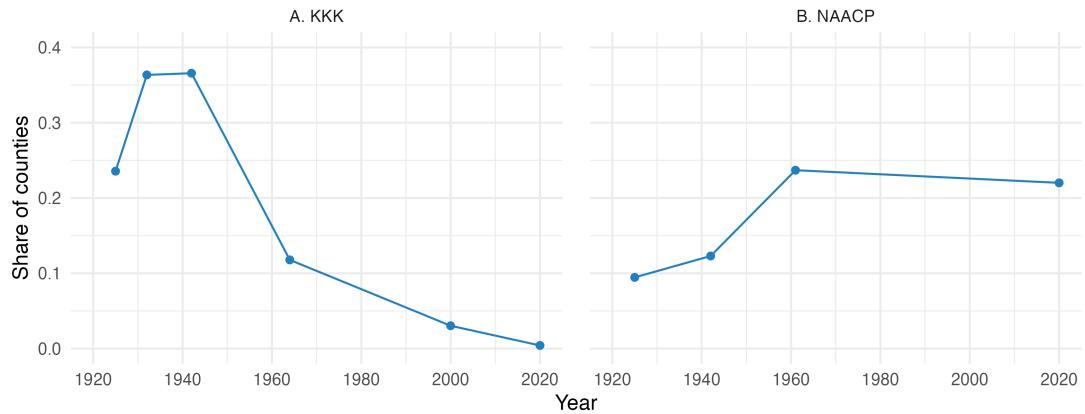


Note. The figure shows the mean attitudes by survey year for each of the respective survey items. Outcomes are standardized and centered at 0. Data availability for each question is reported in Appendix Figure C11.

C.2 Presence of KKK and NAACP

Figure C16 shows the share of counties with KKK branch and NAACP chapter presence over time.

Figure C16: Mobilization against and in favor of civil rights, over time

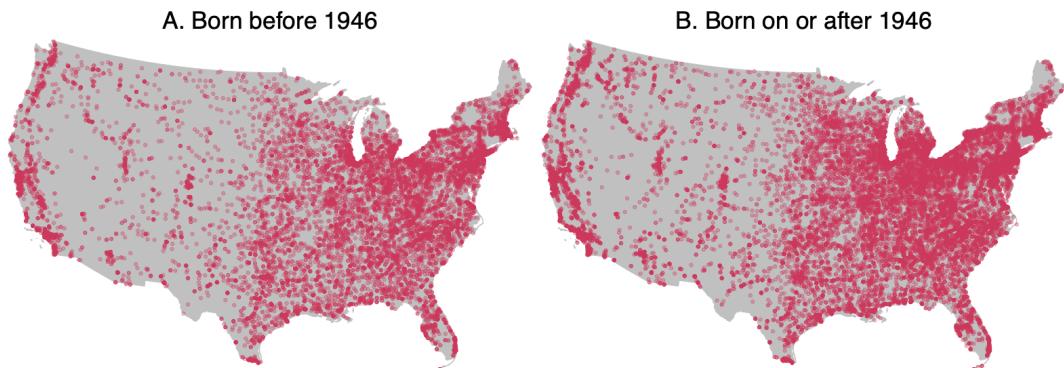


Note. The figure shows the share of counties where KKK (panel A) or NAACP (panel B) are present. Data is obtained from multiple sources described in Section 3.6.

C.3 Casualties during the Vietnam War

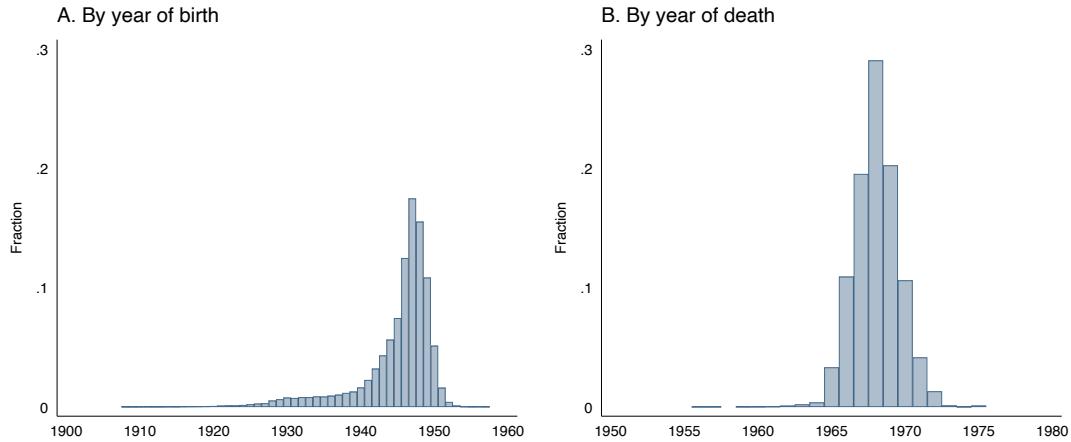
Figure C17 shows the geographical distribution of casualties reported by DCAS for the Vietnam War, depending on the year of birth of the soldier. Each casualty is geo-coded using the city of the home of record. Figure C18 shows instead the distribution of casualties by year of birth and by year of death.

Figure C17: Geographic distribution of U.S. casualties during the Vietnam War



Note. The figure shows the geographical distribution of casualties using the home of record city. Each dot represents a single casualty. All casualties are attributed to the conflict in Vietnam. The left figure selects only soldiers born before 1946, while the right figure selects only soldiers born on or after 1946. The data source is the DCAS dataset, described in Section 3.

Figure C18: U.S. casualties during the Vietnam War, by year of birth and death



Note. The figure shows the distribution of casualties during the Vietnam War, distinguishing by birth year (left figure), and by death year (right figure). The data source is the DCAS dataset, described in Section 3.

C.4 Voting for segregationist candidates in the Deep South

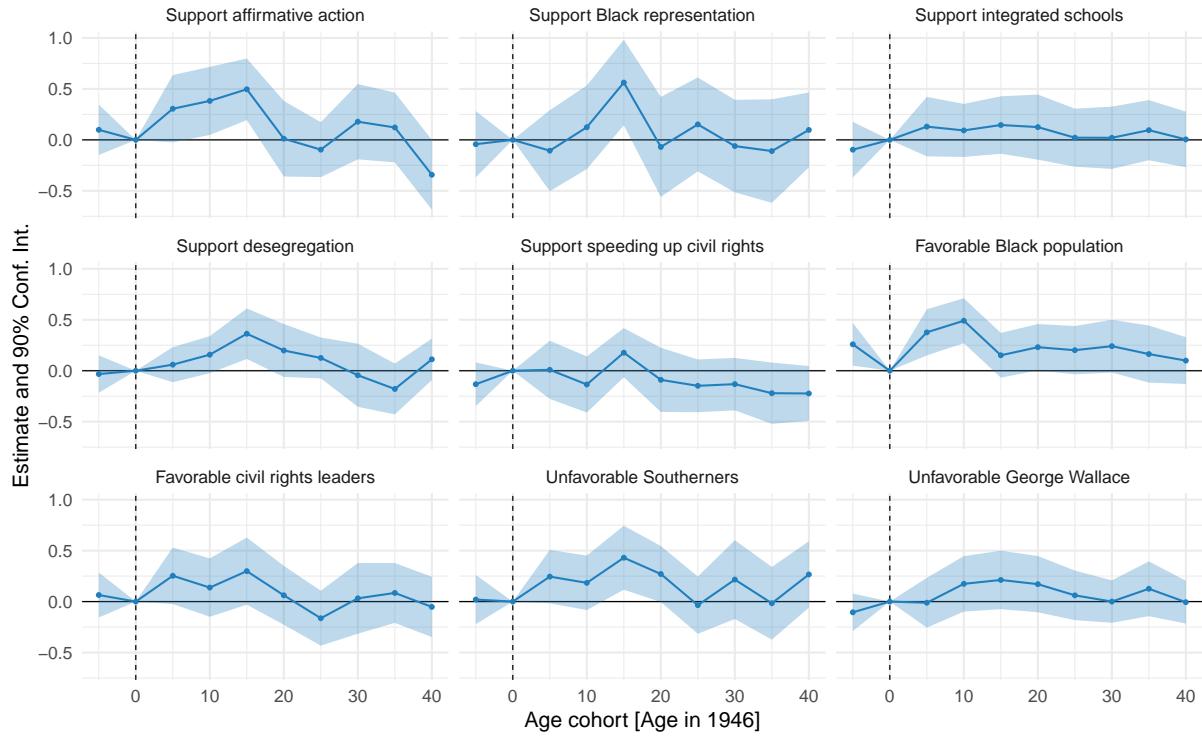
State	Referendum	Detail	Majority county	Share county	Share state
Alabama	Boswell Amendment (1946)	Act designed to prevent African Americans from registering to vote by requiring potential voters to "understand and explain" any section of the U.S. constitution, giving large discretionary powers to local registrars. Introduced following the outlawing of the common practice of holding "whites-only" primaries.	Sumpter	0.94	0.59
Georgia	Private School Amendment (1954)	Amendment authorizing the conversion of public schools to private schools. Allowing upholding of racial segregation in schools in response to the U.S. Supreme Court's public-school desegregation decision.	Baker	0.94	0.62
Louisiana	Closure of integrated public facilities Amendment (1960)	Amendment authorizing the closure of any integrated public schools, in response to the U.S. Supreme Court's public school desegregation decision.	Winn	0.92	0.70
Mississippi	Morals as voter qualification Amendment (1960)	Act designed to prevent African Americans from registering to vote by requiring potential voters to be of "good moral character", giving large discretionary powers to local registrars. Introduced following the outlawing of the common practice of holding "whites-only" primaries.	Carroll	0.93	0.76
South Carolina	Private School Segregation Amendment (1952)	Amendment authorizing the conversion of public schools to private schools. Allowing upholding of racial segregation in schools anticipating the U.S. Supreme Court's public-school desegregation decision.	Calhoun	0.96	0.74

Note. Public referendums used for classification of politicians in the Deep South. Data stems from [Bartley and Graham \(2006\)](#). Refer to Section 3.6 for a detailed explanation of the methodology. *Majority county* indicates the state's county with the highest share of segregationist votes. *Share county* is the referendum vote share in the respective county for a pro-segregationist position, and *share state* indicates the average pro-segregation vote share across all counties within the respective state.

D Additional analysis

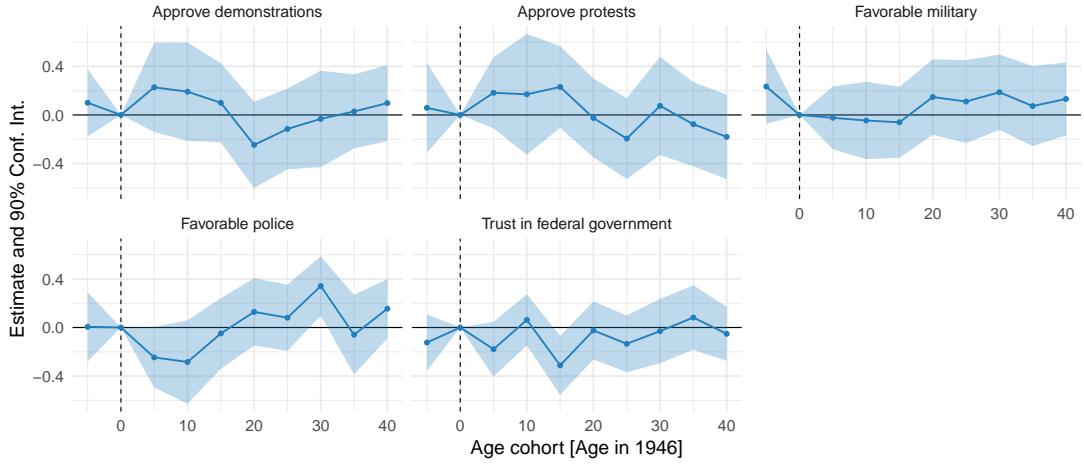
D.1 Cohort study for individual survey questions

Figure D19: Cohort study estimates on the Support for Civil Rights Index, by individual survey items



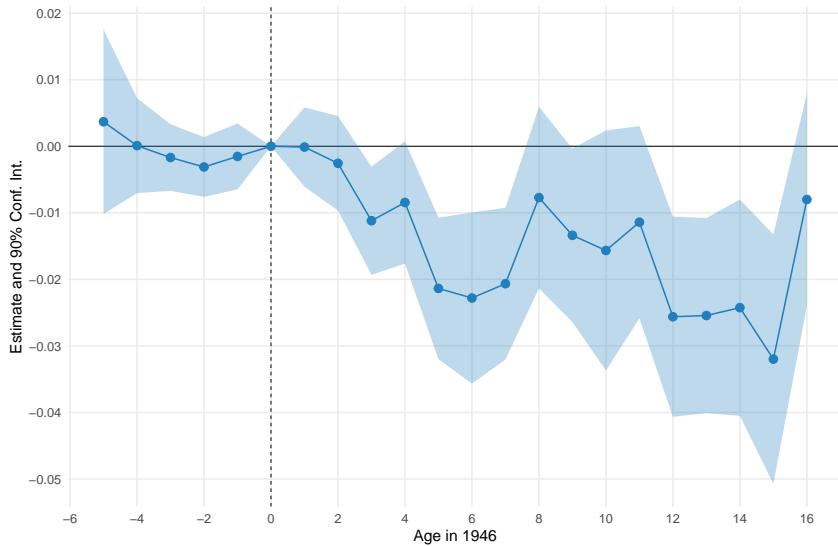
Note. The figure presents the cohort study plot of the effects of *Operation Intolerance* on the variables comprising the *Support for Civil Rights Index*. Each panel plots the coefficients from equation (2) of the interaction term between the age cohort in 1946 and the exposure to *Operation Intolerance* in the county, defined as the share of the population in the county that was covered by the radio signal of the program in 1946. The shaded areas indicate the confidence intervals at the 10% confidence level, computed assuming errors clustered at the county level. The vertical line indicates the cohort that is born at the time of *Operation Intolerance*. The dependent variables are reported in z-scores and defined by: *favorable towards civil rights leaders* measures the feelings towards civil rights leaders, ranging from 1 (unfavorable) to 100 (favorable); *favorable towards Black population* measures the feelings towards the Black population, ranging from 1 (unfavorable) to 100 (favorable); *unfavorable towards George Wallace* measures the feelings towards George Wallace, ranging from 1 (favorable) to 100 (unfavorable); *unfavorable towards Southerners* measures the feelings towards Southerners, ranging from 1 (favorable) to 100 (unfavorable); *support for affirmative action* measures the beliefs over whether the government should make efforts to improve the position of Blacks, ranging from 1 (Blacks should help themselves) to 7 (Government should help Blacks); *support for integrated schools* is an indicator variable equal to 1 if the respondent believes that the government should ensure racially-integrated schools; *support for Black representation* measures the beliefs over the influence of Blacks in American life and politics, ranging from 1 (too much influence) to 3 (too little influence); *support for desegregation* is an indicator variable equal to 1 if the respondent rejects strict racial segregation; *support for speeding up civil rights* is an indicator variable equal to 1 if the respondent believes that civil rights leaders are not pushing too fast for their goals. Additional details about the variables are presented in Appendix C.1.

Figure D20: Cohort study estimates on dissent and institutional trust, by individual survey items



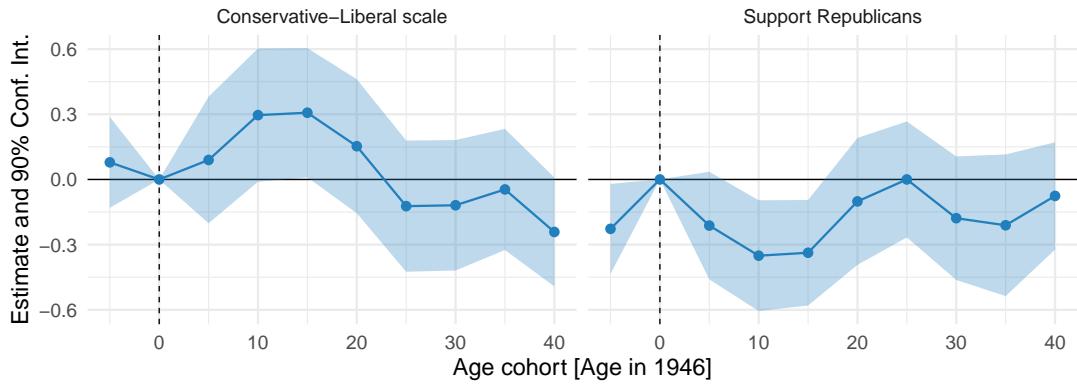
Note. The figure presents the cohort study plot of the effects of *Operation Intolerance* on the variables comprising the *Support for Civil Rights Index*. Each panel plots the coefficients from equation (2) of the interaction term between the age cohort in 1946 and the exposure to *Operation Intolerance* in the county, defined as the share of the population in the county that was covered by the radio signal of the program in 1946. The shaded areas indicate the confidence intervals at the 10% confidence level, computed assuming errors clustered at the county level. The vertical line indicates the cohort that is born at the time of *Operation Intolerance*. The dependent variables are reported in z-scores and defined by: *approve of protests* is the degree of approval of participation in protests, ranging from 1 (disapprove) to 3 (approve); *approve of demonstrations* is the degree of approval of participation in demonstrations, ranging from 1 (disapprove) to 3 (approve); *trust in the government* is the degree of trust in the federal government doing the right thing, ranging from 1 (never) to 4 (always); *favorable towards the police* measures the feelings towards police, ranging from 1 (unfavorable) to 100 (favorable); *favorable towards the military* measures the feelings towards the military, ranging from 1 (unfavorable) to 100 (favorable). Additional details about the variables are presented in Appendix C.1.

Figure D21: Cohort study estimates on the participation in the Vietnam war



Note. Estimates based on equation (2). The dependent variable is the cohort-specific share of deaths assigned to a county based on the place of birth (multiplied by 100). We estimate equation (2) at the cohort-county level, thus comparing the distribution of the outcome variable within a cohort across counties with varying exposure of *Operation Intolerance* in 1946. The shaded area indicates the confidence intervals at the 10% confidence level. The vertical line indicates the cohort born when *Operation Intolerance* was launched. Additional information about the data is provided in Section 3.

Figure D22: Cohort study estimates on political attitudes by individual survey items

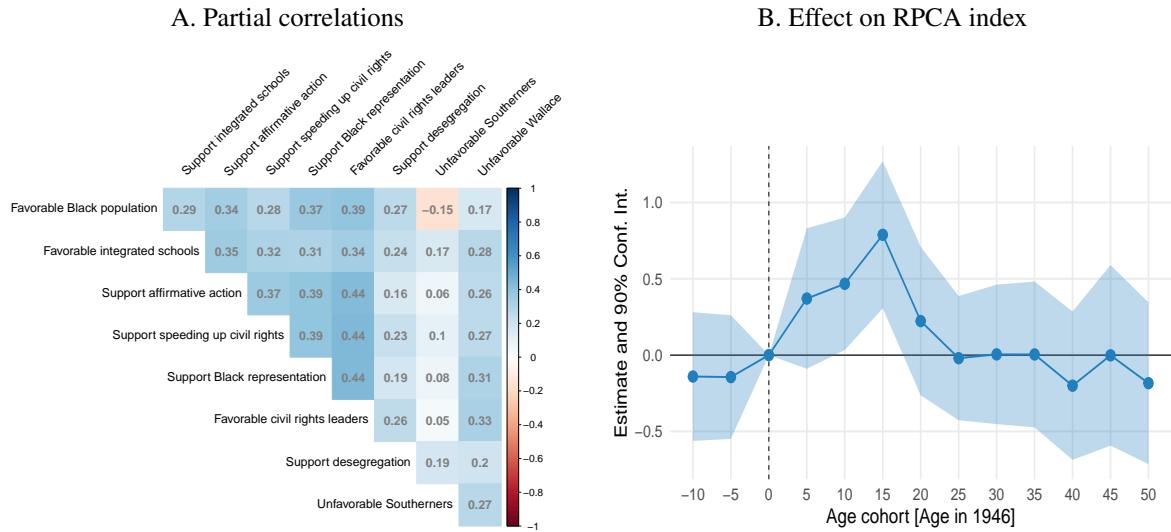


Note. The figure presents the cohort study plot of the effects of *Operation Intolerance* on the variables comprising the *Support for Civil Rights Index*. Each panel plots the coefficients from equation (2) of the interaction term between the age cohort in 1946 and the exposure to *Operation Intolerance* in the county, defined as the share of the population in the county that was covered by the radio signal of the program in 1946. The shaded areas indicate the confidence intervals at the 10% confidence level, computed assuming errors clustered at the county level. The vertical line indicates the cohort that is born at the time of *Operation Intolerance*. The dependent variables are reported in z-scores and defined by: *Conservative–Liberal Scale* measures political preferences, ranging from 1 (most conservative) to 100 (most liberal); *support for Republicans* measures the feelings towards Republicans, ranging from 1 (favorable) to 100 (unfavorable). Additional details about the variables are presented in Appendix C.1.

D.2 Alternative approach to compute the Support for Civil Rights index

Panel A of Figure C13 shows the partial correlation of each variable used. To address the relatively high share of missing observations in our dataset, we complement results presented in Figure 5 with an alternative index built on a regularized iterative principal component analysis (RPCA) methodology (Josse and Husson, 2012, 2016). This iterative procedure corresponds to an expectation maximization algorithm estimating missing values and resulting principal components. We use the first principal component as dependent variable, capturing 46.5% of the variation in our sample. Panel B of Figure D23 reveals that the alternative modelling choice leads to qualitatively similar conclusions as compared to Figure 5.

Figure D23: Support for Civil Rights Index, partial correlations and effect on the RPCA index



Note. Panel A visualizes partial correlation between individual responses across different survey items measuring civil rights related attitudes. Outcomes are standardized and centered at 0. Panel B plots the cohort study effects of *Operation Intolerance* on the Support for Civil Rights index, computed using the BPCA methodology described in Appendix D.2. The figure plots the coefficients from equation (2) of the interaction term between the age cohort in 1946 and the exposure to *Operation Intolerance* in the county, defined as the share of the population in the county that was covered by the radio signal of the program in 1946. The shaded area indicates the confidence intervals at the 10% confidence levels, computed assuming errors clustered at the county level. The vertical line indicates the cohort that is born at the time of *Operation Intolerance*. Additional details about the variables are presented in Appendix C.1.

D.3 Robustness analysis

In this Section, we perform alternative robustness checks for our main results on the Support for Civil Rights Index. First, Table D5 shows robustness of main results to sample selection and controlling for the coverage of other radio stations. Columns (1)–(2) presents the effect on the Index, but excluding the counties where the MBS antennas were placed, and focusing uniquely on migrants, which were not in the location of the interview when they could have been exposed to Operation Intolerance. Second, Table D6 shows robustness of main results to alternative specifications for equation (2). Third, in our main analysis we measure radio exposure as the area of a county that is covered by a sufficiently strong radio signal. Table D7 shows results using alternative measures for coverage, varying the minimum level of signal strength to consider an area covered, using binary coverage, and using the share of a county that is covered (without correcting for the presence of population). Finally, Table D8 shows results correcting standard errors for spatial correlation in the errors using the Conley (1999) correction.

Table D5: Robustness to sample selection and controlling for the coverage of other radio stations

	Dependent variable: Support for Civil Rights Index			
	Exclude counties with MBS antenna	Migrants	Other radio	Major networks
	(1)	(2)	(3)	(4)
A. All cohorts				
Target × Exposure	0.158*** (0.05)	-0.03 (0.061)		0.181*** (0.05)
Target × Other radio			0.047 (0.051)	
Target × ABC				-0.005 (0.044)
Target × CBS				-0.017 (0.041)
Target × NBC				0.022 (0.043)
R ²	0.21	0.28	0.21	0.21
Observations	7,652	4,692	10,503	10,503
B. Exclude younger cohorts				
Target × Exposure	0.157*** (0.054)	-0.006 (0.065)		0.182*** (0.054)
Target × Other radio			0.035 (0.053)	
Target × ABC				-0.018 (0.048)
Target × CBS				-0.031 (0.046)
Target × NBC				0.047 (0.048)
R ²	0.21	0.29	0.21	0.22
Observations	5,791	3,798	7,842	7,842

Note. Estimates based on equation (2) grouping target cohorts into a single cohort. *Target* is an indicator variable equal to 1 if the respondent was 3–17 years old in 1946, while *exposure* is the share of the population in the county that was covered by the radio signal of *Operation Intolerance* in 1946. Panel A includes all available cohorts, while panel B excludes the younger cohorts. Standard errors clustered by county are reported in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01). Dependent variable in all columns is the support for civil rights measured by an index as presented in Section 5.1. Column (1) excludes counties which host a MBS antenna from the estimation. Column (2) limits the sample to individuals who grew up in a different state from their state of residence. Column (3) replaces exposure to Superman by exposure to any other radio signal. Column (4) adds target times coverage interactions for all major radio networks.

Table D6: Alternative specifications for equation (2)

	Dependent variable: Support for Civil Rights Index				
	(1)	(2)	(3)	(4)	(5)
A. All cohorts					
Target × Exposure	0.156*** (0.033)	0.167*** (0.043)	0.167*** (0.044)	0.169*** (0.045)	0.179*** (0.044)
Targeted coverage		Yes	Yes	Yes	Yes
State × year fixed effects			Yes	Yes	Yes
Time effects				Yes	Yes
Individual controls					Yes
R ²	0.14	0.14	0.19	0.20	0.21
Observations	10,503	10,503	10,503	10,503	10,503
B. Exclude younger cohorts					
Target × Exposure	0.181*** (0.036)	0.182*** (0.045)	0.181*** (0.048)	0.180*** (0.048)	0.176*** (0.047)
Targeted coverage		Yes	Yes	Yes	Yes
State × year fixed effects			Yes	Yes	Yes
Time effects				Yes	Yes
Individual controls					Yes
R ²	0.15	0.15	0.20	0.21	0.22
Observations	7,842	7,842	7,842	7,842	7,842

Note. Estimates based on equation (2) grouping target cohorts into a single cohort. *Target* is an indicator variable equal to 1 if the respondent was 3–17 years old in 1946, while *exposure* is the share of the population in the county that was covered by the radio signal of *Operation Intolerance* in 1946. Panel A includes all available cohorts, while panel B excludes the younger cohorts. Standard errors clustered by county are reported in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01). Descriptive statistics and temporal coverage of the variables comprising the index are presented in Appendix C.1.

Table D7: Alternative measures of coverage

	Dependent variable: Support for Civil Rights Index				
	Baseline $\tau = 66$ (1)	Optimistic $\tau = 60$ (2)	Pessimistic $\tau = 72$ (3)	Binary (4)	Area coverage (5)
A. All cohorts					
Target × Exposure	0.179*** (0.044)	0.159*** (0.039)	0.186*** (0.044)	0.142*** (0.036)	0.1792*** (0.041)
R ²	0.21	0.21	0.21	0.21	0.21
Observations	10,503	10,503	10,503	10,503	10,503
B. Exclude younger cohorts					
Target × Exposure	0.176*** (0.047)	0.16*** (0.041)	0.211*** (0.048)	0.138*** (0.039)	0.174*** (0.045)
R ²	0.22	0.22	0.22	0.22	0.22
Observations	7,842	7,842	7,842	7,842	7,842

Note. Estimates based on equation (2) grouping target cohorts into a single cohort. *Target* is an indicator variable equal to 1 if the respondent was 3–17 years old in 1946, while *exposure* is the share of the population in the county that was covered by the radio signal of *Operation Intolerance* in 1946. Panel A includes all available cohorts, while panel B excludes the younger cohorts. Standard errors clustered by county are reported in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01). In columns (1-3) we apply different thresholds values to classify sufficient signal strength, before calculating the share of the population in the county that was covered by the radio signal of *Operation Intolerance* in 1946. Column (4) uses an indicator variable equal 1 if more than 50 percent of the county population is covered. Column (5) measures exposure as the share of county area covered. The dependent variable is the *Support for Civil Rights Index*, which aggregates z-scores from individual questions capturing support for civil rights. Descriptive statistics and temporal coverage of the variables comprising the index are presented in Appendix C.1.

Table D8: Robustness to spatial correlation in the error terms

	Dependent variable: Support for Civil Rights Index					
	25km (1)	50km (2)	100km (3)	200km (4)	300km (5)	400km (6)
A. All cohorts						
Target × Exposure	0.179*** (0.043)	0.179*** (0.044)	0.179*** (0.043)	0.179*** (0.037)	0.179*** (0.047)	0.179*** (0.05)
R ²	0.21	0.21	0.21	0.21	0.21	0.21
Observations	10,503	10,503	10,503	10,503	10,503	10,503
B. Exclude younger cohorts						
Target × Exposure	0.176*** (0.045)	0.176*** (0.044)	0.176*** (0.042)	0.176*** (0.041)	0.176*** (0.043)	0.176*** (0.046)
R ²	0.22	0.22	0.22	0.22	0.22	0.22
Observations	7,842	7,842	7,842	7,842	7,842	7,842

Note. Estimates based on equation (2) grouping target cohorts into a single cohort, correcting standard errors for spatial correlation in the errors using the [Conley \(1999\)](#) correction. Standard errors are reported in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01). Column headers indicate distance cut-off values to spatially cluster standard errors. *Target* is an indicator variable equal to 1 if the respondent was 3–17 years old in 1946, while *exposure* is the share of the population in the county that was covered by the radio signal of *Operation Intolerance* in 1946. Panel A includes all available cohorts, while panel B excludes the younger cohorts. Descriptive statistics and temporal coverage of the variables comprising the index are presented in Appendix C.1.

D.4 Effect on attitudes towards other groups

Table D9 provides cohort study estimates on favorable feelings towards other groups. Columns (1)–(3) focuses on attitudes towards religious groups. Columns (4)–(6) focuses on attitudes towards markets and inequality. Column (7) provides instead estimates for attitudes towards the White population.

Table D9: Cohort study estimates of the effect on religious tolerance and market attitudes

Favorable towards...	Religious groups			Markets and inequality			Other
	Jews (1)	Protestants (2)	Catholics (3)	Poor people (4)	Big businesses (5)	Unions (6)	White population (7)
A. All cohorts							
Target × Exposure	-0.064 (0.112)	-0.106 (0.077)	0.022 (0.109)	-0.023 (0.119)	-0.061 (0.076)	-0.081 (0.107)	-0.115 (0.075)
R ²	0.17	0.23	0.20	0.17	0.17	0.14	0.19
Observations	5,075	5,208	5,133	4,517	6,976	7,022	8,197
B. Exclude younger cohorts							
Target × Exposure	-0.088 (0.122)	-0.054 (0.090)	0.067 (0.112)	0.140 (0.146)	-0.074 (0.085)	-0.110 (0.114)	-0.112 (0.085)
R ²	0.18	0.19	0.21	0.19	0.17	0.16	0.19
Observations	4,173	4,288	4,218	3,010	5,378	5,425	6,415

Note. Estimates based on equation (2) grouping target cohorts into a single cohort. *Target* is an indicator variable equal to 1 if the respondent was 3–17 years old in 1946, while *exposure* is the share of the population in the county that was covered by the radio signal of *Operation Intolerance* in 1946. All specifications include controls for targeted coverage, state-by-year fixed effects, time effects, and individual controls (see Section 4). Panel A includes all available cohorts, while panel B excludes the younger cohorts. Standard errors clustered by county are reported in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01). The dependent variables are reported in z-scores and defined by column's header: (1) *favorable towards Jews* measures the feelings towards people of Jewish religion, ranging from 1 (unfavorable) to 100 (favorable); (2) *favorable towards Protestants* measures the feelings towards people of Protestant religion, ranging from 1 (unfavorable) to 100 (favorable); (3) *favorable towards Catholics* measures the feelings towards people of Catholic religion, ranging from 1 (unfavorable) to 100 (favorable); (4) *favorable towards poor people* measures the feelings towards poor people, ranging from 1 (unfavorable) to 100 (favorable); (5) *favorable towards big businesses* measures the feelings towards big businesses, ranging from 1 (unfavorable) to 100 (favorable); (6) *favorable towards Unions* measures the feelings towards labor unions, ranging from 1 (unfavorable) to 100 (favorable); (7) *favorable towards the White population* measures the feelings towards the white population, ranging from 1 (unfavorable) to 100 (favorable). Descriptive statistics and temporal coverage of the variables are presented in Appendix C.1.

D.5 Additional evidence concerning newspapers

D.5.1 Salience of Superman in local newspapers

Figure D24 shows the geographical distribution of newspapers used in the analysis. Figure D25 shows the salience of Superman on radio in local newspapers around the launch of Operation Intolerance, depending on whether a county was covered by the broadcast in 1946. In Panel A, for each county-month we create a binary variable taking the value of 1 if we find at least one reference to the words *Superman* and *radio* in the same page of a newspaper, and 0 otherwise. In Panel B, for each month, we focus on the share of total pages published that has a reference to the words *Superman* and *radio* in the same page of a newspaper (multiplied by 100). We distinguish counties covered by *Operation Intolerance* in 1946, defined as whether in a county a positive share of inhabitants was covered. Figure D26 shows the same descriptive analysis, but focusing on themes related to intolerance, bigotry and prejudice (and related derivatives).⁴

D.5.2 Salience of civil rights in local newspapers

We focus on 25 themes that capture the salience of civil rights on local newspapers. The themes are bigotry, civil disobedience, civil liberty, civil rights, desegregation, discrimination, equal opportunity, equal rights, human rights, integration, intolerance, Jim Crow laws, KKK, NAACP, negro, prejudice, race relations, racial, racial justice, racial quality, segregation, social justice, states' rights, tolerance, and voting rights. The list is AI-generated by ChatGPT 3.5 using the following request: *I am an academic economist. I am analysing a sequence of U.S. local newspapers published in the period 1930–1980. I am interested in finding articles promoting the narrative of the Civil Rights Movement and of racial tolerance, but I can only search for words or sequence of two words. Can you list the most important ones I should focus on? Restrict the result to words that were in use throughout the period and not only after the 1950s.* The following table provides the search strings used to compute salience of each theme.

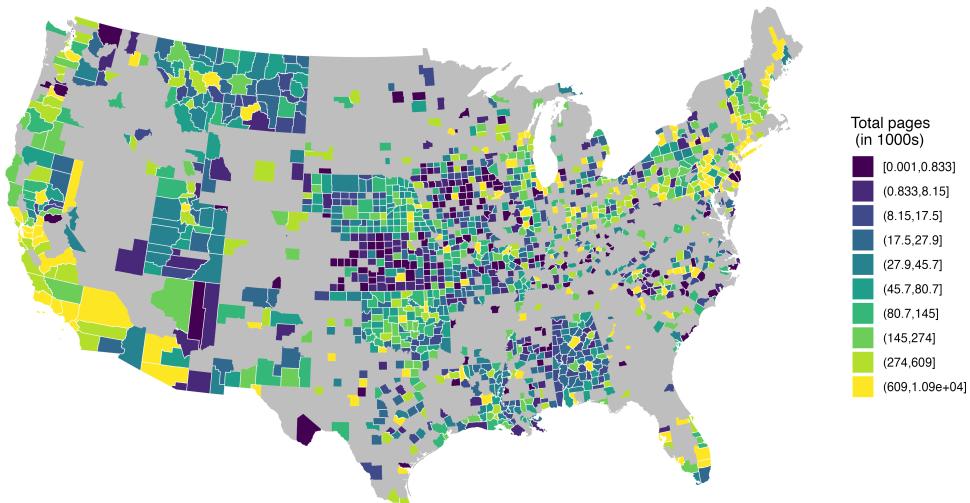
N.	Theme	Search string 1	Search string 2
1	Bigotry	bigot*	
2	Civil liberty	civil liberty	
3	Civil rights	“civil rights”	civil rights
4	Civil disobedience	civil disobedience	nonviolent OR nonviolence
5	Discrimination	discriminat*	
6	Desegregation	desegregat*	
7	Equal opportunity	“equal opportunity”	
8	Equal rights	“equal right”	
9	Human rights	“human right”	
10	Integration	integration	integrat*
11	Intolerance	intoleran*	hate
12	Jim Crow laws	“jim crow” OR “separate but equal”	separate equal
13	KKK	klan OR klux	lynching OR lynched
14	NAACP	naacp OR “advancement of colored”	
15	Negro	negro*	
16	Prejudice	prejudic*	
17	Race relations	“race relation”	
18	Racial	racial	
19	Racial equality	(race OR racial) (equal* OR inequal*)	race creed color
20	Racial justice	(race OR racial) (justice OR injustice)	
21	Segregation	segregat*	
22	Social justice	social (justice OR injustice)	
23	States' rights	“states' rights”	
24	Tolerance	toleran*	
25	Voting rights	voting right	“voting rights” OR “right to vote”

Note. For certain themes, multiple searches were performed. Each column indicates a separate search. Words enclosed in quotes are searched in the way they appear. *OR* is the *OR* operator, meaning that either of the conditions is searched. * is used to allow a search for all words starting with the same root.

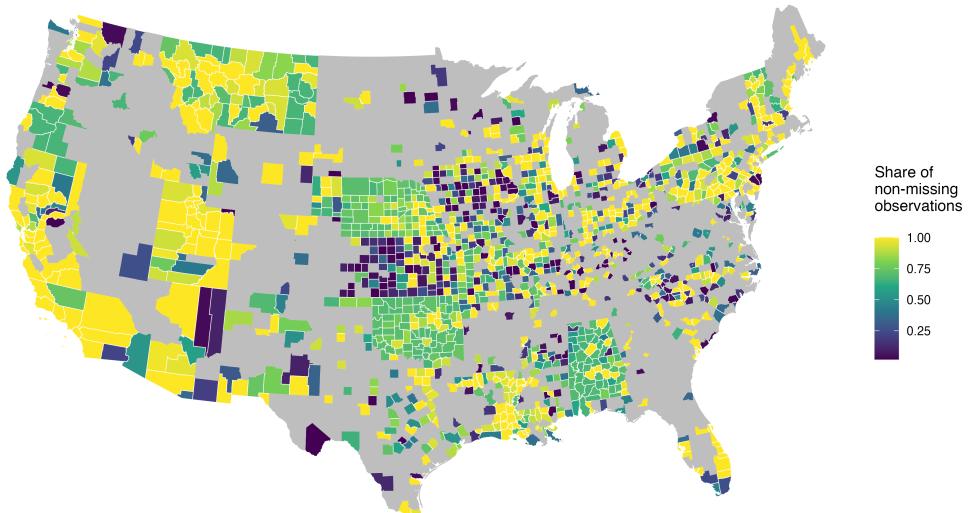
⁴We search for pages mentioning words starting in either *intoleran*, *bigot*, or *prejudic*. For instance, the first would capture pages containing the noun *intolerance*, the adjective *intolerant* or the adverb *intolerantly*.

Figure D24: Descriptive statistics for local newspapers, 1930–1980

A. Total number of pages



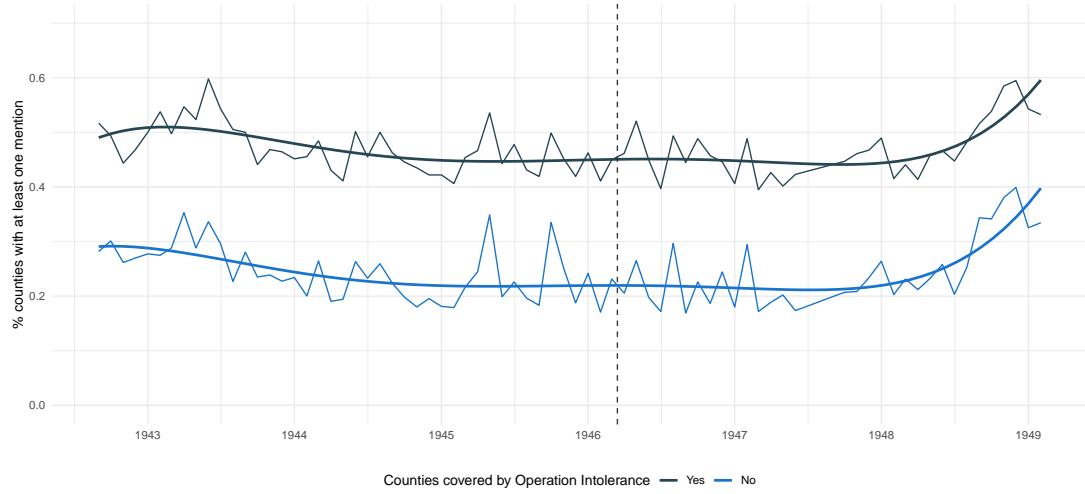
B. Share of non-missing observations (yearly level)



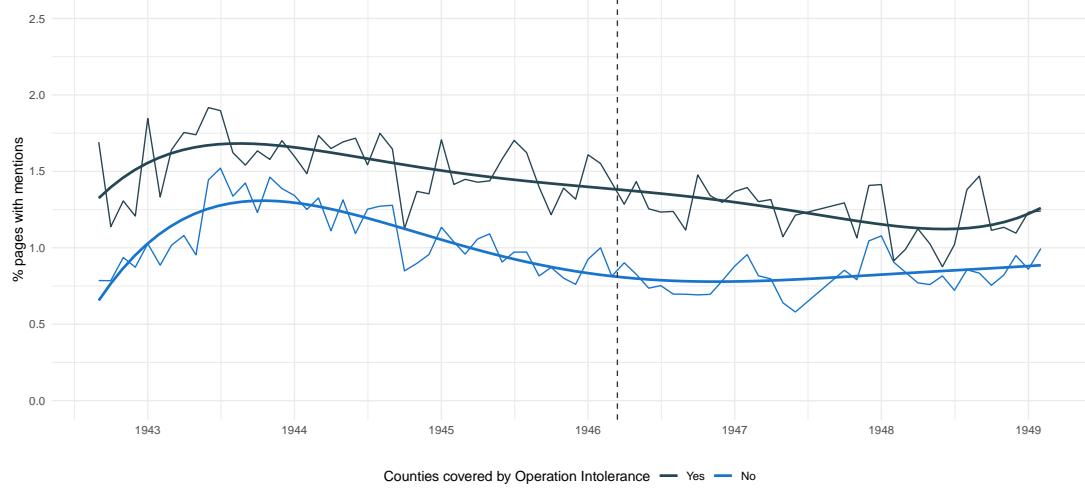
Note. The figure shows descriptive statistics for the data gathered from the online archive [newspapers.com](#) (see Section 3.5 for further details). Data are a time series at county-monthly level. Gray areas are counties without any data in the archive. Panel A shows the geographical distribution of the total number of pages per county in the period January 1930 – December 1980. Panel B shows the share of non-missing observations, when we compute the total number of pages at yearly level using all available data within each county-year. In this case, the number of pages is aggregated for the whole U.S. by year relative to the launch of *Operation Intolerance* in April 1946.

Figure D25: Salience of Superman in local newspapers

A. Share of counties with at least one mention



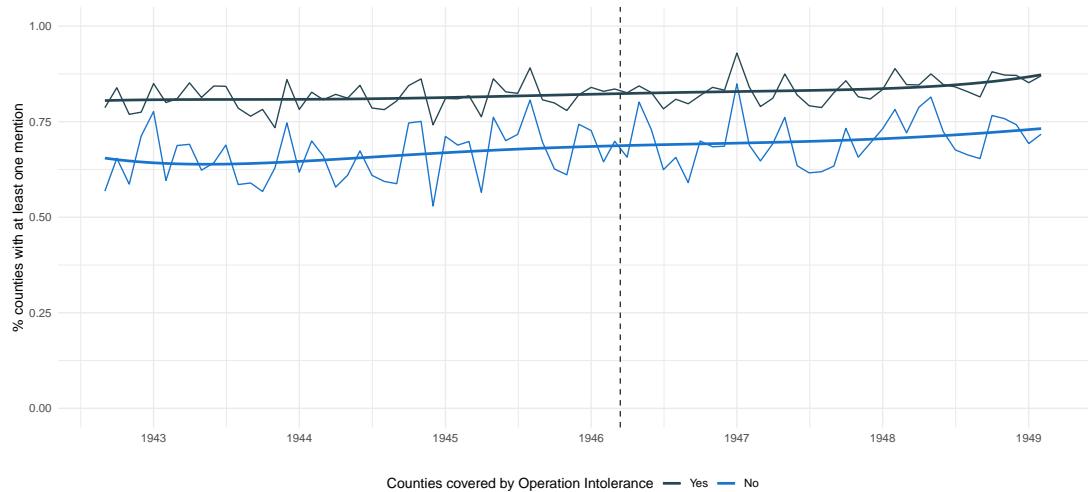
B. Share of total published pages with at least one mention



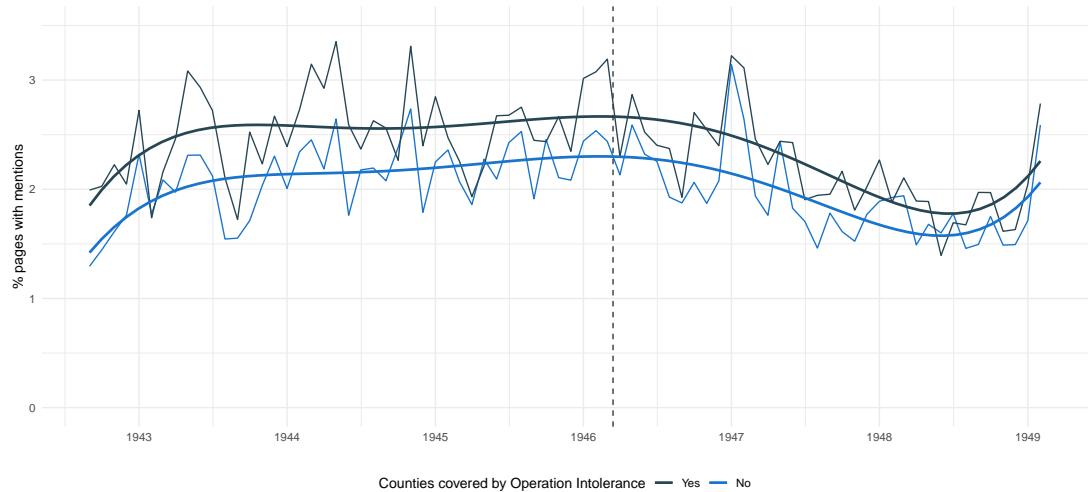
Note. Panel A shows for each month the share of counties in which there is at least one reference to the words *Superman* and *radio* in the same page of a newspaper. Panel B shows the share of total pages published that has a reference to the words *Superman* and *radio* in the same page of a newspaper (multiplied by 100). Counties covered by *Operation Intolerance* are those in which a positive share of inhabitants was covered by *Operation Intolerance* in 1946. See Section 3.1 for the procedure to compute coverage. Thicker lines provide a smoothed version of each series, estimated using a polynomial in time of degree 5. Section 3.5 provides further details about the source of newspaper data.

Figure D26: Bigotry, intolerance and prejudice in local newspapers, by coverage

A. Share of counties with at least one mention



B. Share of total published pages with at least one mention

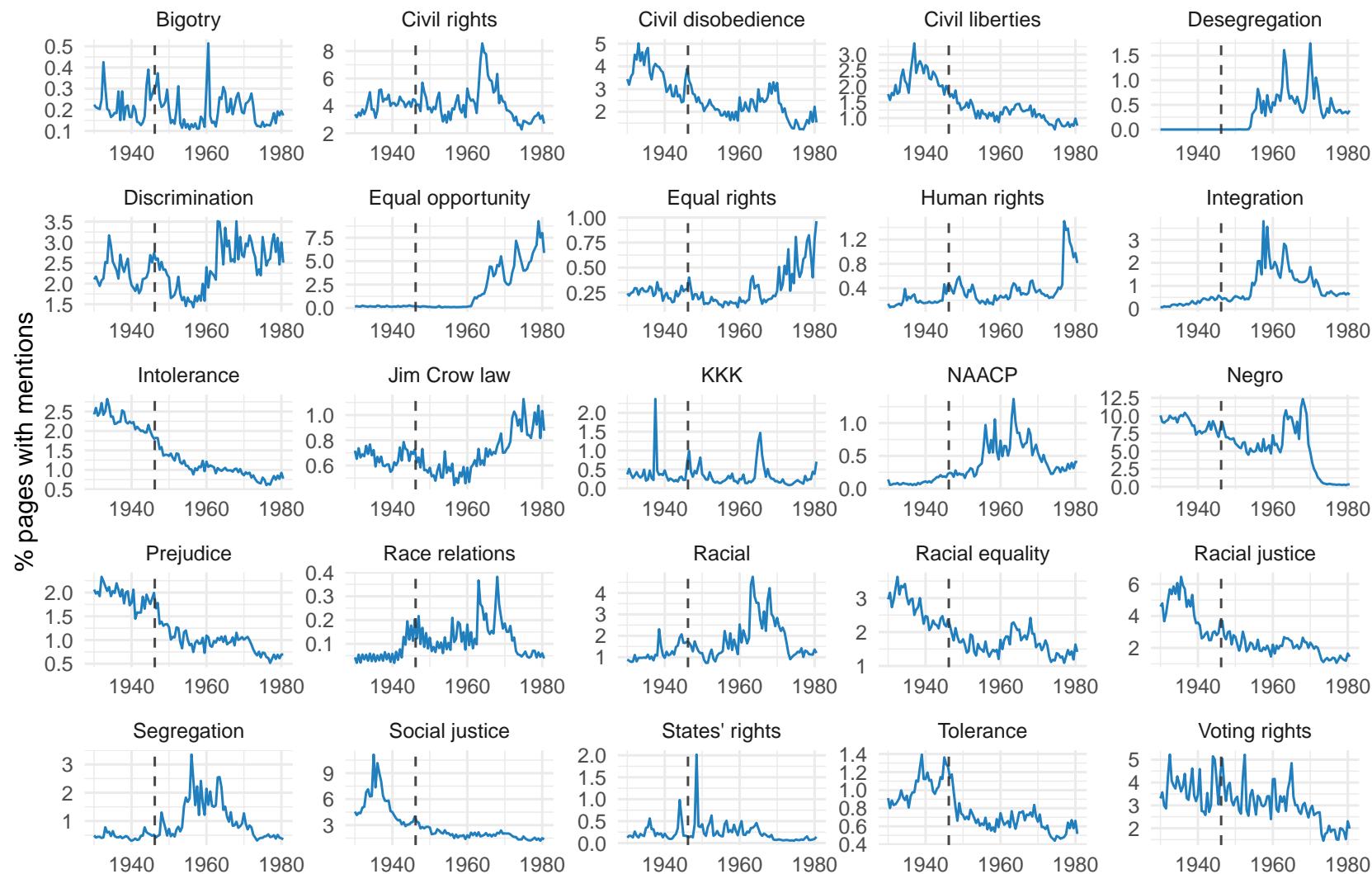


Note. Panel A shows for each month the share of counties in which there is at least one reference to any word starting with *intoler*, *bigot*, or *prejudic*. Panel B shows the share of total pages published that has a reference to these words (multiplied by 100). Counties covered by *Operation Intolerance* are those in which a positive share of inhabitants was covered by *Operation Intolerance* in 1946. Thicker lines provide a smoothed version of each series, estimated using a polynomial in time of degree 5. See Section 3.1 for the procedure to compute coverage. Section 3.5 provides further details about the source of newspaper data.

Figure D27 shows the share of total pages published in each year containing a specific theme included in our measure of salience of civil rights on local newspapers (see Section 3.5). Figure D28 shows the average value over time of index capturing the salience of civil rights in local newspapers. We describe the construction in Section 3.5. Table D11 provides instead event study estimates of the effect of *Operation Intolerance* on the salience of civil rights in local newspapers, using alternative measures to build the index. Columns (1), (3), (5) and (7) provide estimates for the post 1946 periods using equation (3) and pooling all post-1946 observations, while columns (2), (4), (6) and (8) split the estimate of the effects in two periods, the 1946–1955 period and the post 1955 period. Columns (1)–(2) provide estimates for the index built using the procedure detailed in Section 3.5. Columns (3)–(4) follow the same procedure, but in this case the index is built by aggregating in the index all available themes. Columns (5)–(6) also follow the same procedure, but in this case the index is built using a more restrictive criteria to exclude themes not used in the pre-1946 period (excluding bottom half of the themes ranked on the average share of pages in the pre-1946 period). Finally, results in columns (7)–(8) follow a different approach by building a balanced panel for all counties in which at least one observation is available, and by building the index using regularized iterative principal component analysis (RPCA) methodology (Audigier et al., 2016; Josse and Husson, 2016), which deals with data structures characterized by missing data.

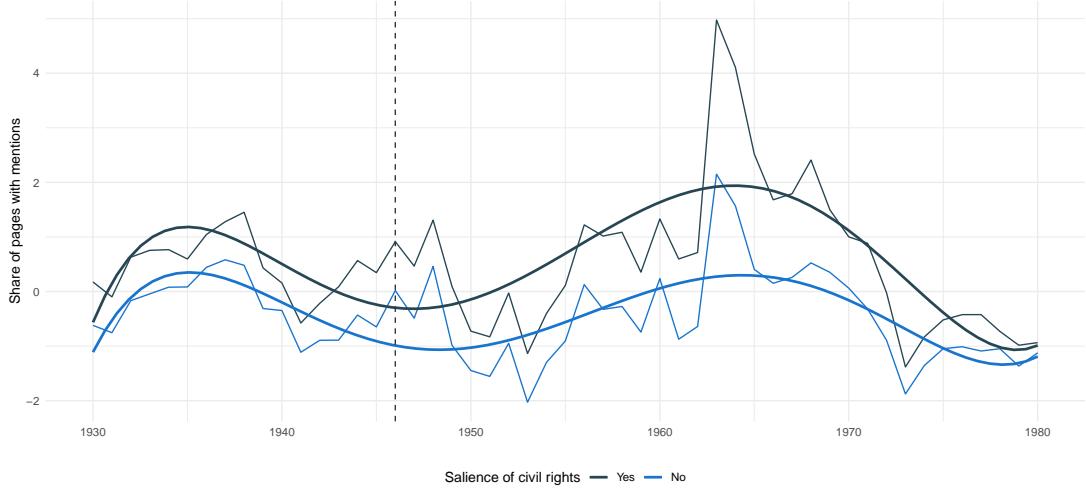
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Figure D27: Share of total pages covered by each theme, by year (1930–1980)



Note. The figure shows the share of total pages published in each year containing a specific theme. Themes are selected according to the procedure detailed in Section 3.5. The share is aggregated for the whole U.S. and by semester. Each data point includes one year relative to the launch of *Operation Intolerance* in April 1946. For instance, the data point for year 1946 includes the period April 1946 - March 1947. The vertical line indicates the year 1946, when *Operation Intolerance* was launched.

Figure D28: Salience of civil rights on local newspapers, by coverage of *Operation Intolerance*



Note. The figure shows the yearly average of the measure of salience of civil rights in local newspapers using all available themes (see Section 3.5. This variable is used in Columns (3)–(4) of Table D11. *Counties covered by Operation Intolerance* are those in which a positive share of inhabitants was covered by *Operation Intolerance* in 1946. See Section 3.1 for the procedure to compute coverage. Section 3.5 provides further details about the source of newspaper data. Each data point includes one year relative to the launch of *Operation Intolerance* in April 1946. For instance, the data point for year 1946 includes the period April 1946 – March 1947. Thicker lines provide a smoothed version of each series, estimated using a polynomial in time of degree 5.

Table D11: The effect of *Operation Intolerance* on the salience of civil rights

Method:	Salience of civil rights on local newspapers							
	PCA (top 80% of themes)		PCA (all themes)		PCA (top 50% of themes)		RPCA (top 90% of themes)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post 1946 × Exposure	0.526** (0.242)		0.498* (0.257)		0.488** (0.217)		0.315 (0.207)	
Period 1946–55 × Exposure		0.152 (0.194)		0.130 (0.184)		0.183 (0.178)		0.039 (0.175)
Post 1955 × Exposure		0.668** (0.281)		0.637** (0.307)		0.603** (0.248)		0.411* (0.236)
R ²	0.710	0.710	0.713	0.713	0.734	0.734	0.610	0.610
Counties	845	845	845	845	845	845	1,475	1,475
Observations	39,797	39,797	39,797	39,797	39,797	39,797	75,225	75,225

Note. Estimates based on equation (3) and pooling all post-1946 observations. Standard errors clustered at the county level are presented in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01). *Post 1946* is an indicator variable equal to 1 if the period of observation is posterior to the year 1946, *Period 1946–55* is an indicator variable equal to 1 if the period of observation is between the years 1946 and 1955, and *Post 1955* is an indicator variable equal to 1 if the period of observation is posterior to the year 1945. *Exposure* is the share of the population in the county that was covered by the radio signal of *Operation Intolerance* in 1946. Dependent variables are reported in the column's header and defined as follows: (1)–(2) index built using the procedure detailed in Section 3.5; (3)–(4) index built using the procedure detailed in Section 3.5, but aggregating all available themes; (5)–(6) index built using the procedure detailed in Section 3.5, but including only the top half of the themes ranked on the average share of pages in the pre-1946 period; (7)–(8) index built using a balanced panel for all counties in which at least one observation is available, and aggregating themes using the RPCA methodology. In columns (1)–(6), the sample is restricted to counties where newspaper data are available for more than 70% of the observations in the period 1930–1980. Columns (7)–(8) include all counties with at least 1 observation in the period 1930–1980. Additional details about the variables are presented in Appendix C.1.

D.6 Evidence on electoral returns

We gather information about voting in national elections from Clubb et al. (1987), gathering county-level returns for elections to the U.S. House of Representatives and the U.S. presidency for the period 1932–1972. Table D12 shows estimates of the effect of *Operation Intolerance* on county-level electoral returns. In panel A, we compare

the pre-broadcast period to the post-broadcast period, while in panel B, we further split the post-broadcast period in two periods depending on the salience of the Civil Right Movements, divided by the year 1955. The year indicates an increase in salience due to the centrality in the history of the Civil Rights Movement of the arrest of Rosa Parks in 1955 and of the Montgomery Bus Boycott. In columns (1)–(2), we focus on the elections of the House of Representatives, while columns (3)–(4) focus on Presidential elections. Columns (1) and (3) include all counties where both the Democratic and the Republican party have non missing vote shares, while columns (2) and (4) include all counties where both parties have positive vote shares. Because the timing of elections is different, we use only elections in the years in which both elections happened. The House of Representatives elections directly impacted the passage of the civil rights legislation, and thus provided the opportunity of more marginalized groups to elect representatives who would advocate for their concerns. Presidential elections brought instead executive authority and influence over civil rights policy. We use as our main outcome variable the vote share obtained by the Democratic Party over the total votes obtained by the Democratic and the Republican parties. We label this variable as the *Democratic vote share*.⁵ Figure D29 shows the estimates corresponding to columns (2) and (4), but using equation (3) to highlight how effects evolve over time. In columns (5)–(6), we focus instead on the vote for pro-segregation presidential candidates. Namely, Strom Thurmond in 1948 and George Wallace in 1968. We estimate a version of equation (3) in which we compare the 1948 and the 1968 elections, thus studying whether *Operation Intolerance* reduced the vote for pro-segregation candidates in these two elections.

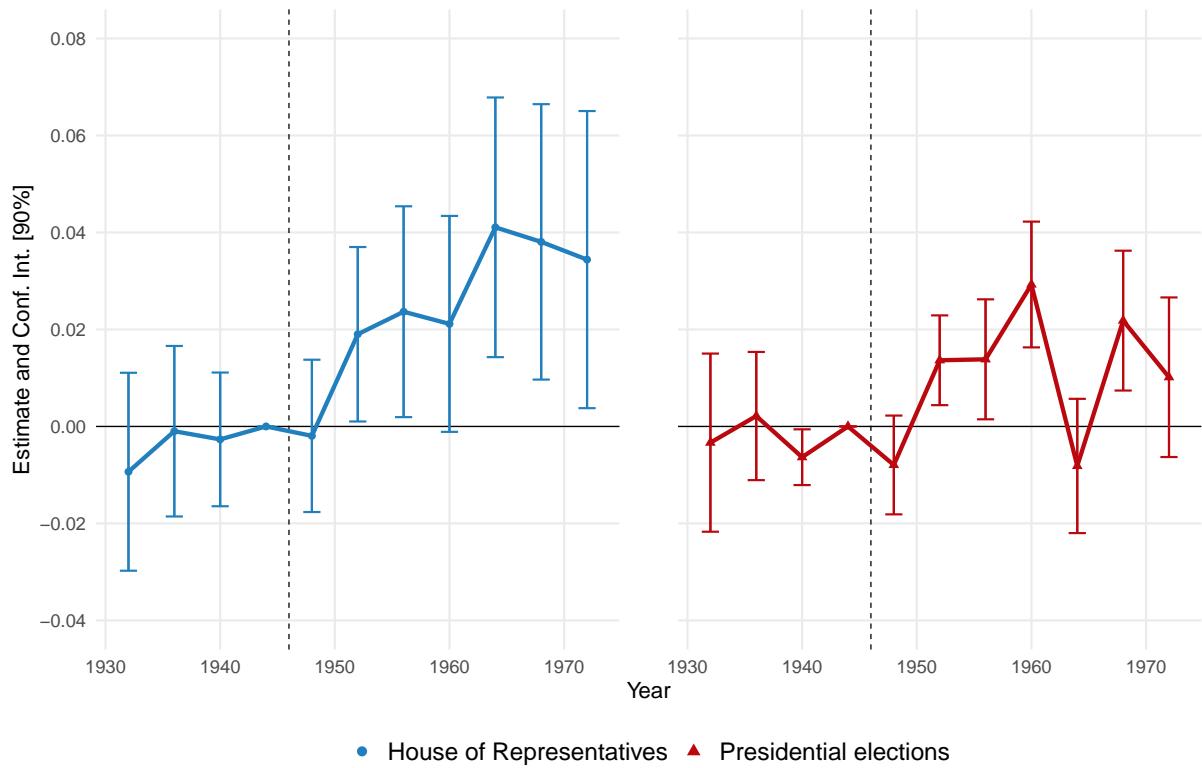
Table D12: The effect of *Operation Intolerance* on electoral returns

Elections:	Democratic vote share				Pro-segregation voting	
	House of Representatives		Presidential		Thurmond vs Wallace	
	All	Positive returns	All	Positive returns	All	South
	(1)	(2)	(3)	(4)	(5)	(6)
A. Event study						
Post 1946 × Exposure	0.027*** (0.010)	0.027*** (0.010)	0.013** (0.006)	0.013** (0.006)		
R ²	0.8747	0.8513	0.9198	0.9192		
Observations	24,125	28,495	33,836	33,940		
B. Event study – by salience of civil rights						
Period 1946–55 × Exposure	0.012 (0.009)	0.011 (0.010)	0.005 (0.005)	0.005 (0.005)		
Post 1955 × Exposure	0.021** (0.009)	0.024** (0.012)	0.010* (0.006)	0.010* (0.006)	-0.051*** (0.019)	-0.062*** (0.020)
R ²	0.8749	0.8514	0.9199	0.9193	0.9575	0.9284
Observations	24,125	28,495	33,836	33,940	4,221	2,018

Note. Estimates based on equation (3) and pooling all post-1946 observations. Standard errors clustered at the county level are presented in parentheses (* p < 0.1, ** p < 0.05, *** p < 0.01). Observations are weighted by the voting age population, provided by Clubb et al. (1987). Post 1946 is an indicator variable equal to 1 if the period of observation is posterior to the year 1946, Period 1946–55 is an indicator variable equal to 1 if the period of observation is between the years 1946 and 1955, and Post 1955 is an indicator variable equal to 1 if the period of observation is posterior to the year 1945. Exposure is the share of the population in the county that was covered by the radio signal of *Operation Intolerance* in 1946. Dependent variables are reported in the column's header and defined as follows: (1)–(4) Democratic vote share is the county-level vote share obtained by the Democratic Party over the total votes of the Democratic Party and the Republican Party; (5)–(6) Pro-segregation voting is the county-level vote share obtained by Thurmond in the 1948 Presidential elections, and by Wallace in the 1968 Presidential elections. Positive returns indicates that the sample is restricted to counties where both the Democratic Party and the Republican Party have positive vote shares. South restricts the sample to counties in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Texas. Additional details about the variables are presented in Appendix C.1.

⁵The division between Democratic Party and Republican Party became evident in the 1960s when the Democratic Party adopted major civil rights reforms. The tendency of the Democratic Party to sustain civil rights became evident during the 1948 Presidential elections, when, in response to the increasing support of the Democratic Party for civil rights, the States' Rights Democratic Party (or Dixiecrats) was formed in the South (Sitkoff, 1971; Morris, 1984; Dierenfield, 2013).

Figure D29: The effect of *Operation Intolerance* on the Democratic vote share



Note. Estimates based on equation (3). Confidence intervals at the 90% of confidence level are obtained from standard errors clustered at the county level. Observations are weighted by the voting age population, provided by Clubb et al. (1987). Dependent variable is the *Democratic vote share*, defined as the county-level vote share obtained by the Democratic Party over the total votes of the Democratic Party and the Republican Party. Panel A refers to the elections for the House of Representatives, restricted to the years of Presidential elections. Panel B refers to Presidential elections. In both panels, the sample is restricted to counties where both the Democratic Party and the Republican Party have positive vote shares. Additional details about the variables are presented in Appendix C.1.

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