Mass Media and Cultural Homogenization: Broadcasting the American Dream on the Radio*
Job Market Paper

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Abstract

Does media shape culture? I leverage the expansion of radio networks in the United States to identify the impact of access to mass media on cultural assimilation and homogenization. I reconstruct radio network access via a signal propagation model suitable to AM radio, the only radio technology available at the time. I determine what radio channels were available to American households by feeding the propagation model with newly digitized data on the universe of transmitting stations during the interwar period. I combine radio network coverage with several measures of cultural change based on naming patterns for children. Exploiting exogenous variation in radio signal reception induced by soil characteristics and stations' tower growth over time, I provide evidence that network access homogenized American culture. Homogenization occurred through the assimilation of white immigrant and black households towards mainstream white native culture. Assimilation is strongest for immigrant families: foreign parents were six percent more likely to name their sons using popular white names after network access. Focusing on names from baseball players, I suggest that aspirational naming is a key mechanism to explain certain features of the results. While foreign households picked from the full distribution of baseball names, native families chose names exclusively from the most successful, those featured in the All-Star games. Thus, in addition to diffusing information, the radio has subtler effects, increasing the likelihood of "naming for success".

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1 Introduction

From the invention of the printing press to the spread of the internet, breakthroughs in the media industry have increased media access by asymmetrically reducing the costs of assimilation across different groups in society. Scholars have long argued that the sudden democratization of media consumption has had enormous consequences for cultural change and especially for cultural homogenization. This claim has recently gained new energy with the rise of globalization and the increase in the number of critics warning of the disappearance of local identities. On a different note, the economic literature has suggested that societies with strong ethnic, cultural or sub-national divides are more likely to incur into a range of economic and political issues such as lower levels of government quality, lower economic development and worse labor market outcomes (Advani and Reich 2015; Alesina and Ferrara 2005; Ashraf and Galor 2013; Alesina and Zhuravskaya 2011; Cutler and Glaeser 1997). Despite how controversial the topic is, we know little about the extent to which media affect cultural change and cultural homogenization.

In this paper, I leverage the advent and expansion of the very first instance of mass media at-large — radio broadcasting — to quantify the power of mass media in breaking down cultural differences across different groups within the same society. I focus on the expansion of national radio networks between 1924 and 1940 which generated the first national media platform of American history. Starting in 1927, the largest stations of the country formed networks that shared programs, news and ads, broadcasting the same homogeneous content from the west to the east coast (Sterling and Kittross 2001). While non-affiliated stations offered material that targeted local communities, network stations addressed the entire country, airing content of national relevance. This marked an important discontinuity in the history of media access especially for rural areas that had previously been at the margin of the mainstream cultural life of the country (Marchand 1985).

The advantage of investigating the impact of media on cultural homogenization in this historical setting is twofold. First, the early twentieth century United States provides a simplified setting where access to radio was less likely to be confounded by alternative media or methods of communication. Second, the advent of the *Golden Age of Radio* followed one of the most transformative periods in American history, where diversity was at its peak. Between 1850 and 1920, during the Age of Mass Migration, approximately 30 million immigrants from Europe arrived in the U.S. (Abramitzky and Boustan 2017). The arrival of immigrants from all over Europe generated an extraordinary mix of cultures and ancestries that is unique to this moment in history. Mass migration from Europe was not the only factor that increased diversity in American society during this period. Between WWI and the Great Depression, the first Great Migration of African–Americans significantly redesigned the geography of race relations within the country, while 1920 signed the first census year in American history where at least fifty percent of its population lived in urban areas. How did the expansion of radio networks interact with the great cultural stir of the early twentieth century? Did the democratization of media consumption across the country also have implications for the homogenization of culture?

To answer this question, I construct a novel dataset linking radio signals from U.S. stations to U.S. households between 1924 and 1940. I proxy cultural change with first name patterns of U.S.-born children. Names have always represented an important aspect of vertical cultural transmission and have been increasingly used in economics and sociology (Bazzi et al. 2018; Olivetti and Paserman 2015; Abramitzky et al. 2018; La Ferrara et al. 2012; Fouka 2019). I collect and digitize data on the universe of U.S. stations actively broadcasting between 1924 and 1940. I then implement a model of signal propagation from the engineering literature suitable for AM radio, the only radio technology in use at the time. I use the model to predict which households had access to radio signal coming from a network-affiliated station the same year their children were born. To the best of my knowledge, I am the first to implement this specific signal propagation model that reflects the engineering behind AM radio waves.

Identifying variation comes from within-city exposure over time to radio network signal driven exclusively by stations that were located at considerable distance from receiving locations. This strategy isolates differences in network signal access due to the growth of radio antennas and topographical features of the ground that affected radio signal propagation. The interaction of antenna power growth of non-local stations and topographical features caused similar receiving towns to be differentially treated for reasons orthogonal to underlying characteristics that could have also affected local cultural trends. My identification strategy exploits network signal variation on that part of my sample that is located relatively far from the location of the towers. Since radio stations were located in urban areas, my results should be interpreted in a LATE framework: the average treatment effect of mass media on naming patterns local to rural areas and small towns, the portion of U.S. society with historically little access to the cultural production happening in the urban centers of the country.

The main result of the paper is that access to radio networks spurred homogenization of naming patterns through the assimilation of popular white native names. Children born from households with access to radio networks were more likely to have popular white native names than children from households without access to the networks. The average effect over the whole population is positive for all households but hides a great deal of heterogeneity. I find that the impact of the new media is strongest for immigrant and black households, which experienced magnitudes up to six times as large as those for natives. Crucially, I show that, consistent with the nature of national radio networks, only access to network signal had a sizable impact on naming patterns. Non-affiliated stations had little to no effect on assimilation.

Radio networks did not only augment the rate of popular white native names adopted by black and immigrant households, but they also increased the probability that they would use names more distinctively representative of white native newborns. I construct two separate *whiteness* indexes for black and immigrant households (Abramitzky et al. 2018; Fryer and Levitt 2004). The advantage of using this index is to capture the choice of names that were not just popular among white people but were also more representative of white rather than black or immigrant children names. Using this index, I find that access to network radio induced non white-native households to give names that were more likely to be found among white children. Immigrant children with both parents foreign exposed to network signal scored four points higher on the *whiteness* index than immigrant children without network access. Comparing to Abramitzky et al. (2018), the magnitude of assimilation is equivalent to the type of names that an immigrant household would have given after spending eight to ten years in the United States. Similarly to immigrants, treated black households, on average, assigned names that were more likely to be distinctively white. The magnitude of the coefficients is smaller, between two and three points, or approximately ten percent of a standard deviation. Taken together the results show that, as network radio assimilated all households towards the same white native naming patterns, and especially so immigrant and black households, it homogenized naming patterns during the interwar period.

The assignment of popular white native names is driven by assimilation into names representative of birth cohorts of the early 1900s. The top names that radio network was responsible for propagating are names from white native people who, at the time of radio expansion, were between thirty and forty years old. One intuitive explanation is that households were picking names from the personalities mentioned on the radio. I directly explore this possibility, drawing evidence from first names of baseball players active in the same year when naming decisions were made by American households. I show that while network access increased the probability that white boys were named after baseball players, the opposite is true for girls. On one hand, radio networks persuaded households having boys to name their offspring after baseball players. On the other hand, once the media publicly associated names with a masculine activity, families with female children chose to decrease the use of those names. This result speaks directly to how media can alter what society perceives as representative of their own identity, and consequently shape cultural change for the listening audience.

A second explanation consistent with the positive effect of radio networks on assimilation is that, beyond the sheer popularity of radio personalities, households were naming after success. This is a mechanism similar to those documented by papers highlighting the role of economic incentives in driving the choice of names associated with lower economic penalties and higher returns on the labor market (Olivetti and Paserman 2015; Algan et al. 2013; Biavaschi et al. 2017). I explore this mechanism by analyzing the effect of network radio on the likelihood of giving names of baseball players that were featured in All-Star games versus those that appeared only in the regular league. I find that treated immigrant children were more likely to receive a baseball player name independently of whether the player was featured in the All-Star league or not. This was not true for native households. Network radio only increased the likelihood that native families would give names from players who were playing in the All-Star games. This suggests that radio networks served two purposes. The first was pure information diffusion of names that were popular at the time. The second was that it affected the level of prestige attached to some names more than others. Immigrant households, with lower information about what names were more or less popular in the country, assimilated to all names, effectively expanding the set of names on their menu. Instead, native households that already had a well-established set of names to use engaged exclusively in naming after success.

My research speaks to several streams of literature. First, I contribute to the vast literature on the determinants of cultural assimilation in the aftermath of the Age of Mass Migration in the U.S. Much of this research has focused on immigrants' assimilation. In two contributions, Abramitzky et al. (2018) and Abramitzky et al. (2014) show that immigrants assimilated to natives both culturally and in the labor market. Other work points at factors that might explain trends in cultural assimilation including government policies, mass warfare and differential selective migration (Lleras-Muney and Shertzer 2015; Fouka 2019; Knudsen 2019). With respect to this literature, I make two contributions. In the first place, I put forward an unexplored driver of cultural assimilation: the expansion of radio networks, the first broadcasting mass media that featured homogenous content in American history. In the second place, I document a *successful* episode of cultural assimilation. This is an important difference with respect to the contribution from Fouka (2019) which shows that imposed top down assimilation can result in a cultural backlash. The key difference in my setting with respect to Fouka's is that radio networks promoted assimilation without forcefully imposing it on its audience. On the contrary, the cultural aspect of radio networks was sandwiched with the entertainment side of it.

Second, it relates to previous work on the political and cultural effects of media (Gentzkow 2006; Blouin and Mukand 2019; Olken 2009; Yanagizawa-Drott 2014; Bursztyn and Cantoni 2016). Similar to what Blouin and Mukand (2019) show in the context of modern Rwanda, I find that network access spurred the creation of a shared identity in the U.S. during the interwar period. However, I show that assimilation may arise also in the presence of a privately owned radio industry, without the presence of propaganda. My results highlight a new mechanism through which network programming and advertising unified U.S. households coming from a range of different cultural backgrounds towards a common *imagined identity* (Anderson 2006).

My paper is not the first to look at radio in the U.S. In a seminal contribution, Stromberg (2004) uses county-level data on radio ownership to show that more informed voters received larger shares of New Deal spending. In my contribution, I construct a novel dataset that allows us to trace what channels were available at a given location, beyond the ownership information used by Stromberg (2004). The data I construct records radio signal availability at the city or town level: a much more disaggregated level than the county. In addition, my paper is the first to focus on the advent and expansion of radio, the very first broadcasting mass medium. In doing so, I make a technical contribution to the media literature, constructing a novel model of signal propagation for AM radio. This exercise is complementary to what Gagliarducci et al. (2018) do for long-distance AM radio propagation in the context of WWII propaganda. I provide technical details on the propagation model I build in the online appendix (in preparation).

Finally, I contribute to the literature that investigates how shared collective experiences can affect individual attitudes in politically and culturally relevant ways. In a recent contribution, Gennaioli and Tabellini (2018) shows that exposure to cultural change may affect political polarization and demand for redistribution. Depetris-Chauvin et al. (2018) empirically show that shocks to social identity can affect individual political attitudes in relevant ways. While these studies take the link between shared collective experiences and identity formation as given, I focus specifically on how collective experiences might affect cultural identity. My results highlight that cultural formation responds to shared experiences with different degrees of heterogeneity. The magnitude of the response depends both on the type of shock and on the economic incentives that are accompanied by cultural change. In my context, I show that some of the cultural groups with the largest incentive to culturally assimilate, immigrants, display the strongest response to radio exposure.

The paper proceeds as follows. In section 2, I briefly describe the historical background on the expansion of radio networks during the interwar period. In section 3, I document the signal propagation model I have built to reconstruct radio network access. I also detail the historical data on radio I collect and digitize as well as the data source I employ to measure cultural change. I show my empirical setting in section 4. In this section, I explain why my empirical strategy uncovers the casual effect of mass media on cultural assimilation. I present my main results in section 5: Mass media homogenized American naming patterns. I discuss the robustness of the main results in section 6. Finally, I conclude in section 7.

2 Background: Radio Networks Enter American Homes

In 1894, the Italian inventor Guglielmo Marconi developed the first long-distance radio communication. From then until the end of World War I, the communication industry focused on developing the point-to-point aspect of radio waves, making broadcasting just a fad for amateurs. In 1919, Frank Conrad, an engineer at Westinghouse, started broadcasting music and covering baseball games regularly from Pittsburgh. In 1920, the popularity of the broadcasts led to the establishment of the first radio station in the United States, KDKA (Scott 2008).

In the initial phase of radio, electrical manufacturers, newspapers and educational institutes founded most of the stations. Broadcasting per se was not intended as a profitable activity, as stations did not sell time for advertisement. Instead, most licensees invested in radio to further their main activity, to seek publicity or to pursue fun and prestige in their own community. Despite the fact that owners were looking to build a reputation, they were not actively advertising; the sole announcement of ownership was deemed worth the cost.[1] Manufacturing companies provided programs to encourage the sale of sets. Department stores owned a station for publicity. Newspapers built stations to keep up with the news technology and to service their public role (Sterling and Kittross 2001).

Early stations ran a basic schedule, and their equipment was quite rudimentary. The average station would broadcast a great deal of music and a mix of lectures, news and experimental broadcasts (Lippmann 2008); interferences and hours of dead air were not uncommon. By 1923, the total number of stations had already spiked to over 500 (see Figure 1) but many were not powerful enough to reach further than their immediate surroundings. In addition, lots of stations quickly died out as owners became more concerned with their cost.

[Figure 1 about here.]

Despite the issues with financing and interferences, U.S. households were instantly fascinated by "the voice from the air". Two aspects of radio contributed to its quick diffusion. First, the technology needed to receive signal was easy to assemble and did not require

[1] To solve the issue of funding stations, in other contexts (e.g. Europe), the government imposed a tax on the sets sold to finance programming. This did not happen in the U.S. where the industry remained in the hands of private companies. Historians speculate that leaders of the industry were afraid that allowing the government to collect taxes would give power over the choice of programs.

battery or electricity to work. Constructing a basic radio set only required a tuning coil, a crystal detector and a pair of headphones. Second, manufacturers used broadcasting to stimulate the sale of sets. To match demand between 1922 and 1925, 4.1 million radio sets had already been produced in the country (Sterling and Kittross 2001). The fast growth in popularity of the new medium made the U.S. one of the largest radio audiences in the world (Lenthall 2008). The map in Figure 2 shows the rate of radio ownership in 1930 and 1940. Overall, while radio sets were common on the coasts and the midwest, the south lagged behind.

[Figure 2 about here.]

As the number and the power of stations increased, the issue of wave interference became more severe. This induced the U.S. government to promulgate the Radio Act in 1927. Under the new regulation, radio waves were public property; entry was free of charge, but stations had to be licensed by the government. The Act had two major outcomes: it succeeded in alleviating interference between stations and facilitated the organization of radio networks. By 1928, two networks were founded — the National Broadcasting Company (NBC) and the Columbia Broadcasting System (CBS) — followed by a third network in 1934 called the Mutual Broadcasting System (MBS).

A network was formed by a head station, where content was both created and broadcast, and a set of affiliated local stations across the country. Local radio stations got most of their shows and news from the networks, which enjoyed economies of scale in producing radio programs (Scott 2008). Networks also enjoyed major sponsoring by the largest advertising agencies. As ad money flew into the radio industry, better shows were created, which fueled the expansion of networks, and consequently network programming.

Broadcasting networks have been, and largely remain, among the most important producers and distributors of mass culture in the United States.[2] During the earliest years of radio, stations were small; programming varied widely across the country and their orientation was

[2] NBC and CBS still exist today and own major TV networks (MBS was dissolved in 1999).

distinctively local. Networks completely changed this picture. Broadcasting became a corporate business with a national focus (Lippmann 2008). The network form of broadcasting represented an organizational innovation that had a profound effect on radio broadcasting and mass communications in the United States and across the world. By World War II, broadcasting had grown into a national medium for culture, information and entertainment that helped contribute to the "nationalization" of American culture (Lippmann 2008; Cohen 1990).

The decline in the diversity on the airwaves was largely responsible for the growth of cultural homogenization in the United States (Lippmann 2008). The rise of the networks represented the transformation of culture characterized by local and regional variations to a homogeneous national culture. Networks had the power to connect disparate groups in a large society and create new forms of national-level connections. Listeners tuning in to the national network program airing at a specific time joined a shared experience crucial to the concept of the modern "imagined community" of nationhood (Anderson 2006). Networks were able to unify disparate groups of American by connecting them beyond the great distances and the divisions that local parochial forms of media and communication, such as the newspapers, reinforced (Hilmes 1997). It gave citizens in the same work group, department, and factory more common cultural experiences, but also it made them feel part of a larger national culture (Cohen 1990).

The rise of networks was accompanied by criticism from contemporaries regarding the disappearance of local identities. During the Great Depression, many critics feared the power that modern, network-based broadcasting had in imposing a uniform mass culture and expressed concern over how this power was concentrated in the hands of few networks (Lenthall 2008). Leading radio critics worried that local uniqueness would be lost through the increasing imposition of the urban, north-eastern mass culture (of which New York was the symbol) across the radio waves into small towns and American homes (Lippmann 2008).

One of the most important novelties the networks brought into American homes was mass advertisement. It is with the rise of networks that corporations realized the potential of advertisement on a national scale (Sterling and Kittross 2001). Unlike a magazine page that could be flipped, radio advertisement could not be escaped (Gordon 2017). Radio ads were crafted to dramatize the American dream. Ad agencies soon realized that in order to increase sales they to connect emotionally with their audience. People absorbed the values and the ideas of the ads rather than the specifics of the products advertised. Hence, advertisers distorted reality to show certain images more than others. In fact, some realities never appeared at all. There were no factory workers and no religious scenes, nor were working-class families depicted by the ads. Rather, the radio sponsor would show "life as it ought to be", giving the audience an escape from their own reality rather than a mere representation of it. Working with this mantra, advertisers tried to reflect societal aspirations and popular fantasies instead of crude reality. Often ads represented an upscale setting, associating products with higher social classes than the ones in the audience (Marchand 1985). Ads also contributed to shaping a common discourse among otherwise very distant audiences. Advertising's persuasive power, through repetition, ingenuity and slogans, infused sponsors' messages into America's common discourse.

For the 47 percent of Americans who in 1925 lived on farms and in small rural towns, radio was a revolution. The development of radio devices that did not need electricity, and the spread of efficient batteries, made the use of radios almost universal in rural homes during the 1930s. The relative impact of radio networks was much larger in rural areas. Even though free rural delivery of mail (Perlman and Sprick Schuster 2016; Feigenbaum and Rotemberg 2015) had been able to bring news to rural areas, the arrival of radio brought a completely new form of entertainment. It exposed millions of Americans who were until then culturally disenfranchised to mainstream American culture produced in New York. On the farms of Iowa, radio was described as a pervasive and somewhat godlike presence which had come into their lives and homes (Gordon 2017).

3 Data and Radio Coverage

I collect data from a combination of historical sources, including information on radio stations I digitized for this project. The core of my data construction effort is to trace the expansion of radio network coverage during the interwar period. To do so, I implement a new signal propagation model suitable for AM radio technology — the only technology of the time — to link transmitting stations to receiving households. I exploit this link to compute radio exposure and analyze its impact on several measures of cultural change based on first names.

3.1 Radio Broadcasting Coverage

What radio channels could you hear in a given American city during the interwar period? Data on radio signal coverage between 1924 and 1940 do not exist. In this section, I explain how I reconstruct the set of radio channels *on the air* in a given location and point in time. I start by collecting data on location and technical specifications on the universe of radio signal *transmitters*: radio stations. Next, I turn to the full count U.S. Census to obtain the exact location of radio signal *receivers*: U.S. households. Finally, I construct a new signal propagation model to compute stations' signal strength at receivers' location and determine what channels were available to American families.

Data on Signal Transmitters: Radio Stations. I obtain data on radio stations from a set of contemporary magazines that carried a mix of technical material for engineers and radio amateurs and a list of basic information needed to connect to radio channels for a wider audience. These directories are similar to the ones used by Koenig (2019) and Gentzkow (2006) for television. For every year between 1924 and 1940 and for each active station, I retrieve geographic and technical information from the earliest yearly publication I could obtain.[3] I start geolocating each station down to the city level. For simplicity, I assume

[3] According to data availability, I gather information from three different radio directories: "White's Radio Log", "Radio Yearbook" and "Radio Annuals". To be consistent, I rely on the January edition; only for a few years when the January edition was not available did I digitize the February edition.

that the location of the station is identical to the location of the transmitting antenna and I assign each station to a unique non-directional antenna. While not accurate for modern radio, both assumptions reflect the available technology of the time.[4]

I then collect broadcasting information needed to compute coverage, such as the power of the stations and the broadcasting frequency. In addition to technical specifications, I gather information on the owner of the station and, starting from 1928, the network of affiliation, if any. Major networks (NBC, CBS or MBS) provided local stations with high-quality programs bundled with mass advertisement. These same programs and ads were broadcast by all the affiliated stations, generating a unique media platform that blanketed the country. Figure 3 shows all cities with an active radio station by network affiliation in 1930.

[Figure 3 about here.]

Location of Receivers. I require knowledge of which American households received radio signal and when. Since the signal prediction model I employ outputs signal strength at a given latitude–longitude pair, I go to the U.S. census (Ruggles et al. 2017) and geolocate down to a latitude–longitude pair the city or town of residence of all the U.S. households that reported non missing information on the location of residence. This exercise is crucial for pinning down radio signals available in a given city or town and provides me with the list of locations where we are interested in computing the list of radio channels available. I map such locations in Figure 4. The set of households residing in the cities and towns mapped in Figure 4 composes the sample over which I carry out my analysis. I discuss further the characteristics of this sample in the following section, and I give more details on how I constructed it in the Appendix.

[4] In the initial years of radio, many antennas were built on top of the same buildings where radio stations operated, usually on top of hotels or department stores. Initially, all stations utilized non-directional antennas. In the early 1930s, some stations started experimenting with directional antennas; however, the majority used directional antennas to avoid broadcasting over the ocean or to diminish interference, especially with Canadian stations (Schneider 2019). This limits concerns over the extent to which stations were targeting specific locations.

[Figure 4 about here.]

From Senders to Receivers: A Model of Ground Wave Propagation. To identify what radio channels were available to U.S. households, I construct a new signal propagation model suitable to AM technology. The model allows me to use technical specifications of a station to calculate its signal strength at a given location of choice. I use the computed signal strength to pin down what radio channels were available in a given city at a given point in time.

Radio stations during the interwar period broadcast exclusively through amplitude modulation (AM) on lower to medium frequencies.[5] Just like FM radio, AM signal strength is positively affected by the power of the transmitting antenna, and it fades away as distance from the antenna increases. One of the key differences between AM and FM waves is that while FM waves are affected by orography, AM waves are influenced by the conductivity of the soil.[6] Ground conductivity is a pre-determined characteristic, and higher levels translate into a more favorable propagation of radio signal.

I construct a ground wave propagation model based on a simplification of the Sommersfeld-Norton model that I borrow from the radio engineering literature (DeMinco 1999; Trainotti 1990). In the appendix, I show that the signal predictions I obtain from this model replicate official reports from the International Telecommunication Union (ITU 2010). I feed the model with data I collected on U.S. radio stations, ground conductivity, and the location of U.S. households. The model connects all active stations to all receiving locations outputting a level of signal strength. I then keep only connections that are above a minimum cutoff that ensures good reception. To account for higher levels of interference in urban areas, I follow Trainotti (1990) in specifying three different cutoffs depending on whether the receiving

[5] The first experimentations with FM radio started in the late 1930s, but it was only after the war that the first commercial FM stations were established.

[6] The literature on media looking at the effect of radio broadcasts has predominantly focused on FM radio. For this reason, the go-to propagation model in the literature is the Irregular Terrain System (ITS) model. However, this model is not suitable for the frequencies at which AM propagates.

household lived in an urban, residential or rural location.[7] Finally, I use the set of surviving signal connections available in a city to pin down the list of channels available in that location. This allows me to compute the number of radio channels available and to determine whether any of the channels was affiliated to a network, and if so, to what network.

[Figure 5 about here.]

[Figure 6 about here.]

[Figure 7 about here.]

In relative terms, radio networks were more prevalent in rural areas than in urban areas. Figure 5 shows that, on average, the number of channels that a household had access to increased over time. The evolution of the average number of radio channels available follows closely the total number of radio stations actively broadcasting in the country (see Figure 1). While urban areas had access to approximately ten channels by 1940, rural areas were limited to just three. However, despite the difference in radio channel availability, the share of newborns covered by network broadcasts is very similar between urban and rural areas. The geography of radio stations across the country accounts for this fact. Stations tended to cluster in metropolitan areas, and only larger stations, which were network affiliated (see Figure 7), could broadcast far enough to be listened to in rural areas. Hence, while households in urban areas could choose between a variety of radio channels, network affiliated or not, households outside metropolitan areas were limited to larger network channels. This feature, together with the overall scarcity of other media outlets in rural areas, emphasizes the revolutionizing role that network radio played in shaping American media access outside large metropolises.

[7] I construct the urban, residential and urban classification from the census. Results are robust to different classifications of urban, rural and residential. The minimum signal strength needed for good signal reception is 25 mVolt/m for urban areas, 5 mVolt/m for suburban areas and 0.5 mVolt/m for rural areas.

[Figure 8 about here.]

[Figure 9 about here.]

The radio capital of the country was the midwest. Cities like Cincinnati, Cleveland, Pittsburgh and Chicago were among the first to establish 50-thousand-Watt antennas, the largest wattage at the time. For a brief period, WLW in Ohio was defined as America's *super station* when its antenna reached 500 thousand Watts. Outside the midwest, New York City dominated the air on the East Coast with WJZ and WEAF. San Francisco KPO became one of the largest stations on the west coast. In the South, the largest stations were located in Texas. Only in the late 1930s did larger stations in Alabama, Georgia and Louisiana bring network content to the rest of the Southerners.

In Figure 8, I map the expansion of network radio access across the locations that I could geolocate from the U.S. census (the same locations mapped in Figure 4). Areas surrounding large network stations of the midwest were more likely to be covered by a network. As the power of the antennas grew over time, more households gained access to the networks. Figure 8 together with Figure 9 highlights that ground conductivity mattered. Areas with the highest ground conductivity of the country, from the top of the midwest down to Oklahoma and Texas, enjoyed the highest network coverage.[8]

3.2 Data on Newborns and Their Households

I obtain data on the birth cohorts contemporaneous to radio expansion and their families from the U.S. full count census (Ruggles et al. 2017). To attenuate attrition due to mortality and migration between year of birth and census year, I construct my sample stacking up the

[8] Some urban areas, despite having a station in their vicinity, experienced low level of access due to interference. This feature might be partially caused by the model I construct where I impose a relatively higher cutoff for good reception in urban areas than residential and rural areas. While it is possible that my prediction is too conservative for urban areas, working with city fixed effects ensures that I compare network access within the same city over time. This alleviates concerns that systematic differences in the treatment I construct *between* cities might drive my results.

relevant cohorts from the 1930 and the 1940 census, keeping children aged ten years old or less from the 1940 census and six years old or less from the 1930 census. For each birth cohort between 1924 and 1940, I extract information on children's name, gender and race as well as a range of characteristics on their household and their location. While ideally I would like to observe city of birth, that information is not available. Hence, I rely on city or town of residence at census year. I then proceed in associating a latitude and longitude to the town or city where the household resided at census year. Unfortunately, city or town of residence is not systematically reported. I am able to locate the city of residence for 55% of the universe of U.S.-born children. In Figure 4 I map the towns that I could locate; each point in the map is a place where I am interested in predicting network access.

[Table 1 about here.]

The sample I am able to locate is not representative of the full count census. Table 1 shows that although the sample is similar across many dimensions it is much more urban (column 2 versus column 1). Despite this, the sample over which I can identify exogenous variation in signal variation over time (column 3) is predominantly rural. Hence, my results shed light on the effect of radio network expansion over small towns and rural areas of the U.S. To ensure that sample selection is not affecting my results, I construct a second dataset based on the universe of all U.S.-born children between 1924 and 1940. Just like my main sample, I locate 55% of children down to the town of residence listed in the census. For those who have place of residence missing, I locate them at the county centroids. In the robustness section I show that my results are robust to this approximation but coefficients are watered down by measurement error.

Finally, I lack information on the location of birth. Despite this limitation, during the expansion of radio, internal migratory flows were greatly reduced due to the bite of the Great Depression (Fishback et al. 2006). In the robustness section, I show that my results are robust when I focus on a sample of children for whom state of residence at census year was identical to state of birth.

4 Empirical Strategy

In this section, I describe my empirical strategy to analyze the relationship between network access and cultural change. I first explain how I use first names of children born during the expansion of radio networks to measure cultural homogenization, and then I document why my findings support a causal interpretation.

4.1 Measures of Cultural Change using First Names

To assess the impact of radio on cultural homogenization I require a measure of cultural change measurable across U.S. households and over time. Quantifying culture consistently and at an aggregation level that is fine enough is difficult. Hence, I rely on a well established proxy: naming patterns for newborns. First names have been widely used in economics (Bazzi et al. 2018; Olivetti and Paserman 2015; Abramitzky et al. 2018; La Ferrara et al. 2012; Fouka 2019) as well as in sociology (Gureckis and Goldstone 2011) to capture cultural norms and patterns of cultural transmission across generations.

In my study, I examine whether local names were more likely to assimilate to birth cohorts that might have been more representative of people and images presented by radio broadcasts. Networks featured actors and presenters born before the radio, and advertisement often filtered reality, enhancing only certain images. For example, advertisers were biased towards an upscale world that excluded immigrant or black families (Marchand 1985). Hence, I focus on quantifying assimilation patterns towards mainstream native culture, which, during the interwar period, dominated *the air*. To understand the assimilation patterns induced by radio, I construct a set of outcome variables that vary at the children-name level. This allows me to control for household controls, explore heterogeneous effects across relevant characteristics and analyze variation in naming patterns focusing within the same households over time.

The main outcome variable is the likelihood that a name observed locally was one of the most popular names in the white native distribution of names. Given the nature of the personalities on radio, I test for assimilation into top white native names of birth cohorts from the early 1900s. The likelihood of giving a name from the top ten names might also be interpreted as a decrease of individualism in society (Bazzi et al. 2018; Knudsen 2019). Work done by social psychologists highlight how giving the most frequent names reflects lower levels of individualism and correlates with other proxies of collectivism (Varnum and Kitayama 2011). While I aim to measure naming assimilation and homogenization, a reduction in individualism is also consistent with a higher levels of homogenization. Another simple outcome I can construct based on white native national distributions is the rank of the name. Together, these measures gauge the likelihood that households adopted popular native names and allow an assessment of, on average, what was the gap in popularity of the names given to a child before and after the connection to a radio network.

[Table 2 about here.]

In Table 2, I list the top ten white native names across three birth cohorts: 1880, 1910 and 1940. While some names are consistently in the top 10, like John, James, or William, others oscillate in and out, allowing me to differentiate between assimilation into specific birth cohorts. This is particularly true for female names, which exhibit larger rates of variation.

The second set of outcomes takes a name given by a U.S. household and computes the difference in the relative popularity of that name at the local level and in the national distribution. To compute the popularity of a name locally, I rely on the universe of children born in the household's county of residence. This allows me to construct a meaningful distribution of names by gender and race. To understand how the name fared in the two distributions, I examine the percentile of the cumulative distribution of name frequency in shares. I then take the absolute difference between percentile rank for a given name between the two distributions.

While I approximate the popularity of the names available to a household with the county distribution, the naming decision varies at the household by city level. Thus, I compare households that had access to a given menu of names and ask whether those that got connected to the radio networks over time were more likely to pick those names that were ranked similarly in the national distribution of names. Table B.1 offers an example of how I construct this outcome in a population with only three names: James, Gianluca and Bob. In this case, I quantify the distance between local and national naming patterns for a child named Gianluca to be 5 percentile points.

[Table 3 about here.]

To paint a richer picture of the cultural changes introduced by radio networks, I investigate whether immigrant and black households were more likely to give their children names that were not just popular in the nation but that were also more likely to be associated to white children. To do so, I readapt the *foreignness* index of names (Abramitzky et al. 2018) and extend it to black names.[9] For immigrants and African–Americans I construct two separate indexes of *whiteness*. For immigrants, the index is a standardized version of the relative probability that a name was given to a white native versus an immigrant child. The definition for African–American names follows the same logic. It is a standardized version of the relative probability that a name was assigned to a white native versus a black child. In equation 1, I show how I compute the *whiteness* index for immigrants W_{name} from the relative probability of name *whiteness* R_{name}. In both instances, high levels of the index are representative of names disproportionally given to white native children. To make sure these indexes are predetermined with respect to treatment I construct relative probabilities based on names of children born in 1920 (plus and minus two years).

$$R_{name} = \frac{\frac{\#Native_{name}}{total\#Native}}{\frac{\#Foreign_{name}}{total\#Foreign}} \qquad W_{name} = \frac{R_{name}}{1 + R_{name}} \tag{1}$$

Below, I use the outcomes described in this section to support the hypothesis that radio networks affected naming patterns. While I provide direct evidence on first names, I interpret

[9] This is similar to Fryer and Levitt (2004) for black and Fouka (2019) for German-sounding names.

results as a broader shift in the cultural attitudes of the households exposed to radio networks.

4.2 Instrumental Variable Approach

To estimate the causal effect of network access on cultural homogenization, I exploit variation in the reception of radio signal from radio ground waves. Using the propagation model I constructed, I predict signal of U.S. stations at receiving locations. The most important determinants of radio signal reception are the power of the transmitting station, the ground conductivity between the sending and receiving end and the distance between transmitting and receiving locations. As radio towers increased their wattage, radio signal traveled further, and it did increasingly so along paths with better ground conductivity.

Clearly, location and power of radio stations during the interwar period were not randomly assigned. Radio owners built towers in urban areas, and the most powerful stations were clustered in large metropolises. These places exhibited high access to transportation networks and larger access to alternative forms of communication and media such as newspapers and movies. Hence, results based on a naive comparison between towns with and without network access over time might be confounded by omitted characteristics affecting both radio expansion and cultural changes. The inclusion of town fixed effects partially solves this issue by focusing on variation in signal access within the same location over time.[10] However, if urbanized places have also differential access to other form of communication or media over time, changes in network access could also be confounded by changes in other outlets affecting culture independently of radio networks.

A convenient feature of radio signal reception is that its variation was not solely induced by local or nearby stations. Hence, I can decompose the variation in network access in two components: the endogenous part driven by local stations and the exogenous part driven by stations that were far from the receiving location but were powerful enough to spill over in farther areas. The interaction of larger antennas and good conductivity paths positively

[10] Town fixed effects refer to fixed effects to the location I geolocated from the full count census.

affected the expansion of radio signal along some dimensions more than others. To define stations that were sufficiently far from receiving locations, I look at the distribution of all transmitting-receiving signal connections by distance and retain only connections coming from towers located further than the median distance observed in the data. Figure B.1 shows the distribution of signal connections by distance and highlights that the median distance was approximately equal to 112 km, or 70 miles. I then use an instrumental variable empirical framework and instrument network access over time, with network access induced exclusively by the stations located beyond the median distance. In the robustness section, I provide evidence that my results remain unchanged if I require higher distances up to 80^{th} percentile.

One might worry that being reached by a station located beyond the median distance in the data does not take into account the possibility that the receiving end was at the same time located close to another large antenna, effectively considering as exogenously treated a town that in fact was situated near another station. While this is theoretically possible, I argue that it does not have practical importance. Stations were quite spread out across the country, reducing the likelihood that they would propagate signal in each other's immediate relative surroundings. In the appendix A I provide robustness results redefining my instrumental variable using network signal variation when the *minimum* distance from any radio tower ever erected was above the median.

[Figure 10 about here.]

To explain the ideal experiment of my identification strategy I zoom into Illinois' ground conductivity. I focus on two radiuses expanding from Chicago and characterize both treatment and instrument variation induced by the signal exiting from Chicago on four towns in the state. Figure 10 maps the ground conductivity in Illinois and the location of the four towns, Newark, Braidwood, Auburn and Laharpe, for convenience respectively indexed by letters A, B, C and D. Figure 10 presents the period prior to radio expansion. At time zero as no station is active in Chicago, none of the towns is treated.

[Figure 11 about here.]

In Figure 11, I describe the treatment experience of the four cities in this example when Chicago (red square) gets a network affiliated station. At time one, Chicago can propagate signal to cities A, B and C. Despite C and D have the same exact distance from Chicago, city D does not get access because the ground conductivity between D and Chicago is relatively poorer than the one between C and Chicago. This example illustrates another important feature of the empirical strategy: sitting on great conductivity is not enough to receive radio signal. While both C and D have great local conductivity levels, what matters for signal propagation is the conductivity between towers and receiving locations.

Panel (a) maps treatment variation at time one. The OLS specification (with the addition of birth cohort and city fixed effects) would compare changes in naming patterns in cities A, B and C, with changes in non treated cities like D. This is not the variation I want to exploit because cities too close to Chicago might confound the treatment effect of network access with other sources of cultural change that could bias the estimates either upward or downward. Panel (b) presents treatment variation according to the instrumental variable. Since cities A and B are too close to Chicago only city C is considered as treated by the IV. The IV considers cities like A and B always untreated because they are too close to Chicago's tower; given the inclusion of city fixed effects, they do not contribute to the estimation of the coefficient attached to the effect of network access on naming patterns. Hence my estimation strategy compares only variation in naming patters between cities like C and D, before and after they got access to the networks.

Panel (c) of Figure 11 illustrates what happens as the towers in Chicago expand their wattage. Finally, also households in D gain access to network radio. The IV (panel (d)) considers as treated only cities D and C and, compares the change in naming patterns in D to the change in city C, that had been previously treated, as control. This approach makes sure that changes in network access is not correlated with omitted variables that contemporaneously could affect naming patterns in areas were radio towers are particularly dense.

Instead, variation in access is determined exclusively by the growth of stations that were sufficiently far but — because of conductivity and technological improvements — happened to cover places outside their surroundings.

One important feature of my empirical strategy is that it characterizes the impact of media only over areas that were indeed far from antennas. These locations were predominantly composed by small towns and rural areas. The sample over which I observe useful variation in exogenous network signal is the same presented in column 3 of Table 1. While I can only retrieve a local treatment effect, this is also the most relevant portion of society over which the new media had its largest impact (Sterling and Kittross 2001).

$$Y_{ict} = \beta\ 1\{Network_{ct} > 0\} + \gamma X_{ict} + \alpha_t + \alpha_c + \varepsilon_{ict} \tag{2}$$

$$Network_{ct} = \sum_s 1\{Signal_{sct} > \tau\}$$

In equation 2 I formalize the second stage of the instrumental variable strategy. I regress the measures of cultural assimilation based on the name of child i, in birth cohort t, residing in city t, on an indicator for network access in the same city, conditional on a set of household-level controls (X_{ict}), city and birth cohort fixed effects. I define network access equal to one if signal from station s for birth cohort t is larger than a cutoff for minimal reception at the location c where child i is born.

Equation 2 effectively describes a generalized difference in difference analysis. The key assumption that validates the use of this strategy is that naming patterns would have evolved with similar trends in the absence of treatment, between cities that got access to the network and those that did not. In the results section I validate this assumption showing that the reduced form of my IV strategy displays parallel trends between treated and control groups, while OLS does not.

Most relevant controls are all measured at the household head level and include age, nativity status, employment status, occupational score and an indicator for home ownership status. Given the different level of variation between outcome and treatment — child name versus town — I cluster standard error at the treatment (town) level.

To avoid estimating a confounded effect of radio networks, I instrument network access with variation induced exclusively by stations further than the median distance. I present the first stage of this strategy as well as the formalization of the instrument in equation 3. I define exogenous network access — $Network_{ct}^{d>M}$ — equal to one if the signal from station s for birth cohort t is larger than τ *and* the signal is coming from a station which distance is larger than the median distance observed in the data ($Distance_s > Median$).

$$1\{Network_{ct} > 0\} = \delta_1 \, 1\{Network_{ct}^{d>M} > 0\} + \delta_2 X_{ict} + \lambda_t + \lambda_c + \epsilon_{ict} \tag{3}$$

$$Network_{ct}^{d>M} = \sum_s \left(1\{Signal_{sct} > \tau\} \cdot 1\{Distance_s > Median\}\right)$$

[Table 4 about here.]

In Table 4 I show results from the first stage specification displayed in equation 3. Not surprisingly exogenous network access strongly predicts all network access for both white and black households, regardless of the gender of their offspring. Coefficients indicate that households with access to the network signal induced by exogenous stations were between 50 and 60 percent more likely to get access from any station. The F statistics exceed all usual critical values, including the value of 10, indicating a strong first stage.

5 Results

The advent of radio broadcasting followed a period of great cultural transformation in American history. How did radio networks shape local cultural identities? Did access to the first unique media platform provide a common cultural background to which different groups could converge to? Or did it allow for sorting into local content, possibly reinforcing local identities? In this section, I document the main contribution of the paper using newborn naming patterns: access to radio networks homogenized American culture during the inter-war period. Households from different parts of the country exposed to the same national radio networks named their offspring in ways that hewed more closely to each other. Homogenization was driven by assimilation of all households towards the same type of names: representative of white native mainstream culture.

I show that the dynamics of assimilation differed substantially across gender, race and cultural backgrounds. I find that all families were more likely to assign popular white native names after being exposed to radio networks. Crucially, I show that only access to the larger national networks had a sizable impact on name pattens. White households exhibited larger magnitudes of assimilation when naming their daughters rather than their sons. I then break down the main effect on white households to show that the effect was strongest on immigrants and African–Americans. Drawing evidence from an index of assimilation into names representative of white native children, I show that radio networks led immigrant and black households to give names that were *less* likely to be associated respectively to immigrant and black children. While I find that the effects on native households are driven by female children, I observe the opposite pattern between gender for non white-native offsprings, especially for immigrants.

Finally, I argue that radio networks shaped the perception that American households had on what names were considered successful and upcoming. I do so by looking at different patterns of assimilation into baseball players names between immigrants and native and by how well the player performed in a given year.

5.1 The Effect of Network Radio on White Households

I start by examining the effect of radio networks on all white families, regardless of whether the household head was native or foreign. The main empirical challenge is that the expansion of network access might be endogenously driven by local stations. However, one key aspect of radio signal reception is that not all variation is induced by local stations. Hence, I focus on changes to network access that are solely driven by signal received from stations that were far enough, that is, farther than the median distance observed in the data. This approach ensures that network access does not correlate with omitted factors contemporaneously affecting naming patterns.

[Figure 12 about here.]

I first validate the choice of my empirical strategy setting up an event study for the reduced form of my IV approach. I estimate the effect of exogenous network access k years since treatment on the likelihood to assign the ten most popular white native names among birth cohorts from the start of the century. Figure 12 displays the point estimates of this event study over the window $k \in [-5, 6]$ around the first access to network radio. I normalize the coefficient in the year prior to treatment to be equal to zero. The key feature of Figure 12 is that prior to network access (negative years since network access) towns that will be treated are not statistically different in terms of top ten names rates than towns that serve as controls. This validates the standard identifying assumption in difference in differences designs, suggesting that the control group forms a valid counterfactual trend for the treatment group. Intuitively, this is achieved because the IV compares changes in names between small comparable towns before and after the access to networks, leaving out variation from larger urban areas. The figure also shows that after getting access to the networks there is a statistically significant increase of one percent in the probability of naming newborns with top white native names. The effect is stable over the time window.

[Figure 13 about here.]

While the event study over the reduced form show no differential pre-trends, this is not the case when I use variation in network access from all transmitting stations regardless of the distance to receiving locations. Figure 13 shows that before network signal reached treated cities, they were already more likely to have top white native names. The point estimate at time zero shows no effect of network access. This is consistent with the hypothesis that the impact of network access is biased downward when I use signal variation stemming from all stations. The coefficient at $k = 0$ pools together the effect of radio networks in both urban and rural places. It is possible that the broader connection or the intense cultural production that urban areas experience increased diversity effectively biasing towards zero the estimates of network access. As urban areas contain a larger number of children, it weights the estimates towards zero. Taken together the two event studies motivate and validate the use of an instrumental variable approach. In what follows, I show results based on the standard IV strategy described with equations 2 and 3.

[Table 5 about here.]

Table 5 shows that treated white households were more likely to name their children using top ten names from birth cohorts of the end of the nineteenth century. The magnitude is larger for female newborns (column 1), who were 1.8 percent more likely to receive a top name, while boys were 1 percent more likely (column 3). In columns 2 and 4 I highlight that the assimilation effect of radio is driven by network affiliated stations. For both genders, controlling for non-affiliated radio access leaves the coefficient on network access unchanged. In addition, non-network access has no effect in assimilating boys' names, while for female names, the magnitude is quite small and is dominated by the role played by network access. The differential results I find across gender are consistent with previous research that uses names as a proxy for cultural change in economics and sociology (Sue and Telles 2007; Lieberson and Bell 1992).

5.2 Radio Networks Assimilated Immigrants and African–American Towards White America

In the previous section, I showed that white families exposed to network programming were more likely to use white native names. How did other groups in American society respond to radio networks? I show that both immigrant and black households assimilated into white native names, effectively homogenizing naming patterns.

5.2.1 The effect of Radio Networks on Immigrant Households

One of the most important cultural and economic shocks in American history is the Age of Mass Migration. Between 1850 and 1920 approximately 30 million Europeans entered the country profoundly altering its cultural landscape. In this section, I explore how radio networks interacted with immigrant families and how this dynamic compares to white native families. I do this by carrying out two exercises. First, I decompose the main results on white households by the nativity status of the newborn family to show that networks largely facilitated the assimilation of immigrant families. Second, I demonstrate that radio network access increased name whiteness for children of immigrants, speeding up their assimilation process.

[Figure 14 about here.]

Figure 14 breaks down the main result on white families by the nativity status of the parents. Households with at least one foreign parent were much more likely than native households to use white native names after getting access to radio networks. The magnitude of the coefficients for male children from immigrant households is six times larger than those for white native children. The increase in probability of using top native names is equal to six percent for immigrant households. This helps close the gap between urban and rural places that at the start of the study period was approximately equal to ten percentage points. The difference in assimilation to white native names for immigrant and native daughters' names is less stark. This is due to smaller magnitudes for immigrants' daughters and larger coefficients for native ones. Daughters with at least one non-native parent were about four percent more likely to be given top white native names after accessing radio networks.

[Figure 15 about here.]

In addition to using more nationally popular names, the assimilation into white native culture happened through the choice of names that were more distinctively white. I measure the *whiteness* of names chosen by U.S. households following the work by Abramitzky et al. (2018). Names that were distinctively white are different names from those that were overall popular across the country. For example, popular names from white native cohorts are William or James. Names that instead were more likely to be exclusively adopted by white households are names such as Arlie or Coy (see Tables 2 and 3). An increase in the *whiteness* index reflects the increase of adoption of names more similar to the latter.

Abramitzky et al. (2018) show that immigrant households assigned less foreign names as they spent more time in the U.S. They interpret this trend as an increase of assimilation into American culture by immigrant families. Did radio play a role into pushing immigrants to assimilate? I answer this question using a specification with household fixed effects instead of city fixed effects. This allows me to track more precisely changes in name whiteness over time, within the same households, instead of households of a different country of origin. Figure 15 shows that radio networks pushed immigrant households to increase the use of names more likely to be given to white children. I find that the effect is driven by households with both parents foreign, with an increase in the *whiteness* of their offspring names by about four points. The magnitude is non-trivial, as it is equivalent to twenty percent of a standard deviation.

5.2.2 The Effect of Radio Networks on Black Households

Between the end of WWI and the start of the Great Depression, more than 1.3 million African–Americans migrated to the north of the U.S. The sudden inflow of African–Americans in the northern cities made cultural differences between races even more salient (Fouka et al. 2018). In this section, I ask whether network broadcasting, which predominantly featured content made by white people for the rising white middle class, had spillovers on black families, affecting their use of white names or, vice-versa, causing a backlash. I find that exposure to radio networks spurred black families to draw names from top white names and names that were less distinctively associated to black children.

[Table 6 about here.]

The effect of radio networks on black households is more similar to the one I found on immigrant households than the one on white natives. Columns 1 and 3 of Table 6 show that African–American children were more likely to be given popular white native names from the early 1900s. Just like immigrants, the magnitude indicates a stronger assimilation of black boys' than black girls' names. The size of the coefficient for black male children points to an increase in likelihood of almost four percent and it is fifty percent arger than the effect on female names.

In columns 2 and 4 of Table 6 I control for access to radio from non-network stations. Coefficients attached to national network stations remain unchanged, providing additional evidence that assimilation into white native names was a product exclusively of network radio. I find no direct effect of non-affiliated stations on black households' assimilation.

[Table 7 about here.]

Treated black households were more likely to adopt popular names from white native adults born around the turn of the twentieth century. Were these names also distinctively less representative of African–American naming patterns? In Table 7 I show that this was the case. Black households exposed to radio networks assigned, on average, names that were more likely to be associated with white rather than black children. The first row of columns 1 and 3 of Table 7 shows results from a specification with city and birth cohort fixed effects for black children. Network radio led to an increase in the *whiteness* of the names given to both male and female children. The magnitude of the coefficients indicate a slightly stronger results for females, with a reduction of almost 3 points against a reduction of 2 points for males. The magnitude of the effect explains ten percent of a standard deviation, smaller than the effect on immigrants.

In columns 2 and 4 of Table 7 I focus on household fixed effects. I find less evidence that black households were increasingly using white distinctive names. However, household fixed effects are quite demanding for black households, especially given they are much less numerous. This enlarges the standard errors in columns 2 and 4. While the coefficient for black female names stays constant and is significant at the ten percent level, I do not observe a statistically significant effect for black male names.

The second row of Table 7 presents results over white native households. Using city fixed effects, interacted coefficients suggest that white households were also increasing the *whiteness* of names assigned to their offspring. The magnitude is similar between black and white females, while it is much smaller for white male names than black male names. The coefficients on white households are essentially unchanged when focusing on intra-household variation. However, since the effect on black male names becomes smaller, I find a small reduction in how distinctively white names were for sons of white households. The effect is tiny, approximately 0.3 points however it could be suggestive that radio networks decreased how distinctively names could be associated to black or white males.

Taken together, results on white, immigrant and black households show that the rise of radio networks homogenized naming patterns during the interwar period. Homogenization was driven by similar assimilation into popular names from white native birth cohorts. While the effect is positive on all households, it was much larger on immigrants and black families. These households also reacted to network radio assigning names that were less distinctively foreign and black, respectively. How did national radio networks push American families to change their naming patterns? In the next section I investigate the role of famous radio personalities in selling an ideal of assimilation tied with success: baseball players.

5.3 Names From Successful Personalities Drove Assimilation

Radio networks played an important role in changing naming patterns during the interwar period. One intuitive mechanism is that radio broadcasts suggested a set of names that American households could use. These names could be those of the presenters, the actors or even the fictional characters. However, one of the most popular activities broadcast on radio during the interwar period was sports, and especially in this period it was baseball. During this period, radio networks played a key part in making baseball a national sport and an icon of U.S. popular culture.

In this section, I test two closely related explanations behind the main results on assimilation using names from baseball players. I try to disentangle whether assimilation of names was driven by the sheer popularity of the personalities appearing on radio, or whether families were engaging in naming after successful ones. To do so, I collect data on baseball players' names active during the interwar period (Michael Friendly 2019). I match players names active in a year to children's names born in the same year. The dataset allows me to distinguish baseball players who were playing in the regular league from those who were also particularly successful and were featured in the All-Star games.

[Table 8 about here.]

I start by documenting that treated households were more likely to name their boys after baseball players. Table 8 shows that boys from treated families are one percent more likely to be named after baseball players active in the same year they were born. On a different note, families with daughters were less likely to use those same names after radio networks broadcast them. While the magnitude is quite small, the negative sign might indicate that the attachment of those names to specifically masculine roles reduced parents' willingness to use them for females. In this regard, media reduced the gender fluidity of baseball names, altering the set of names that were distinctively male versus female.

Table 8 highlights that households were *buying* names from radio. Disentangling whether it was the persuasion of the radio broadcasts or whether there was something about the ideal of success that was tied with certain personalities is complicated. Obviously, people who appeared on radio a lot, especially on the national networks, were famous and most likely fairly successful as well. One possible approach to teasing out one explanation from the other is to look at the behavior of natives versus immigrant households. Foreign households might have used radio as one of the sources of information to form their menu of names to be given in the U.S. This was much less likely for native households. Hence, comparing the results across these two groups can help understand whether network radio was just *selling* names, or instead, the idea of success behind them.

[Figure 16 about here.]

Using the distinction between regular players and those featured in the All-Star games, I find suggestive evidence that immigrant households were picking names from both sets of players. Native families were not: they named exclusively after players who were successful enough to be part of the All-Star games. Figure 16 plots the coefficients attached to network access by the nativity status of children's parents and by whether players' names were more likely to be All-Star that year. The coefficients on immigrant households are fairly stable across successful and non-successful players, although they are imprecisely estimated for the latter. The size of these estimates is always larger for immigrants than for natives, similarly to what I find in the main results on assimilation. The effect on native households is positive only for players who were featured in the All-Star games, while there is no assimilation into players' names who were playing only in the regular league.

These results suggest that immigrants were expanding the menu of names they used and tended to assimilate to *all names* associated with baseball. On the contrary, natives were picking only names that were tied with successful ones. This finding is indicative that part of the assimilation I documented in the main results might be driven by desire to give their offspring names that were considered to be upcoming. This mechanism is similar to those documented by papers that described the importance of economic incentives in driving naming patterns (Olivetti and Paserman 2015; Algan et al. 2013; Biavaschi et al. 2017). Results from this section document that media can play a large role in determining what societies perceive as success by filtering in some personalities, images and backgrounds rather than others.

6 Robustness Checks

6.1 Robustness to Different Sample Restrictions

In my main analysis I assume that children location of birth is identical to the location of residence at census year. While this assumption is inaccurate for some of the children in my sample, I can rule out that my results are systematically driven by internal migration. While I do not have information on the precise location of birth, the U.S. census reports information on state of birth. In column 2 of Table 9 and Table 10, respectively for white and black families, I show that the effect of radio network access on assimilation are robust to using a sample where I keep only children that lived in the same state where they were born. The sample sizes in column 2 of both tables show that the number of families relocating between the birth of their children and census year is quite low, approximately only three percent of the whole sample. As a result the exclusion of children that had migrated across states leaves estimated coefficients basically unchanged (column 1 reports baseline results for convenience).

One could still argue that because of within state migration, I am mis-measuring location of birth for some of the children in my sample. The most predominant type of migration that we observe in the early twentieth century is one that goes from rural to urban places. This is an issue only if we think that families migrating out of rural into urban areas would have been more likely to resist changing naming patterns after connecting to radio networks.

While I cannot fully investigate this hypothesis, to the extent that the selection of households migrating within states is similar to the one of households migrating across states, results from Table 9 and Table 10 are reassuring that my results are unlikely to be explained by internal migration. In addition it is worth pointing out that the historical period at hand and the type of households, those with young children, contribute to explain why I observe such low rates of across state migration. In particular, the historical period during which radio networks expanded over the country is one characterized by especially low levels of migration. During the 1930s the Great Depression hit the country, greatly reducing internal migratory flows relatively to close decades (Fishback et al. 2006).

I replicate my main specification on a sample that excludes children residing in the south of the U.S. Maps in Figure 2 show that already in 1930 most of the households in the northeast, the midwest and part of the west coast had access a radio set. The South lagged behind the rest of the country. In addition, most immigrants from Europe did not locate in the South. In column 3 of Table 9 I show that the effect of radio networks on white households is not affected by this sample restriction. If anything, I find that focusing on households outside the south of the country increases the magnitude of the coefficients with respect to my baseline.

Differently from white households, for black households I find a significant increase in the magnitude of assimilation, when I look at households outside the south. The size of the coefficients is especially salient for male children, where the estimate is doubles from baseline. While larger in magnitude, coefficients are less precisely estimated and the result on female is marginally not statistically significant. The results on African-Americans seem to suggest that black households that migrated outside the south were different than those that did not migrate ways that also correlated with their response to radio network exposure. It is indeed possible that beyond differences in the availability of radio sets, selection in the type of black people that decided to migrate correlates also with the likelihood to respond to cultural stimulus such as radio.

Results are also robust to focus on a sample that keeps only firstborns. Abramitzky et al. (2018) show that as immigrant spend more time in the United States they were more likely to name their children like natives did. To make sure my results are not driven by an overall trend of name assimilation over time not already captured by birth cohort fixed effects, I focus on the effect that radio networks had on the names of firstborns. Further, especially male first borns of immigrant origin are likely to follow naming conventions of their country of origins, such as naming the first child after the eldest member of the household. In columns 4 of Table 9 and Table 10 I show that running my main specification on a sample composed by firstborns does not significantly affect the estimated effect of network access on the likelihood to give popular white native names. In particular, the effect on treated white households with at least one foreign parent is not driven by later births. In fact foreign households are between 3 and 5 percent more likely to name their first male child using popular white native names from the early 1900s.

Finally, in column 5 of Table 9 and Table 10 I run my main specification on a sample of children with all the aforementioned restrictions: only firstborns still residing in their state of birth at census year and outside the South of the country. For white households the coefficients from this specification are either statistically indistinguishable from the baseline coefficients in column 1 or slightly larger, bringing additional evidence to the robustness of the main results. The effect on black households are qualitatively similar to the baseline results in column 1 but, given the sample size is reduced to one sixth of the original, estimates lose statistical significance.

[Table 9 about here.]

[Table 10 about here.]

To understand what households were able to listen to radio networks I locate US households down to the town or city of residence. Unfortunately the U.S. census does not report this information uniformly. I am able to recover city or town of residence for approximately 55% of the children born in the U.S. between 1924 and 1940. Hence, the baseline sample over which I run my main analysis is composed exclusively by children for which I can observe their household's town of residence (the 55%). This sample is not representative of the universe of U.S. born children during this period. The fact I cannot observe location of residence is strongly correlated with the likelihood the location was urban. Nevertheless, my identification strategy undercover the average treatment effect local to the portion of my baseline sample that is located in rural areas and small towns.

In order to rout doubts on whether my results are driven by sample selection, I locate the rest of the children with missing information on town of residence down to the centroid of their county of residence. This allows me to work with the universe of U.S. born children between 1924 and 1940. Here, I show that my results are robust to using this sample composed by the universe of children. However, consistent with the coarser approximation for 45 % of the sample I find that the magnitude of my results is attenuated by measurement error. The downward bias is particularly salient because most of the children for which I do not observe a precise location are in the west of the country, where counties are relatively larger in size.

[Figure 17 about here.]

[Table 11 about here.]

Figure 17 plots the estimated effect of network access on the likelihood of assigning popular white names by parental nativity status. The plotted coefficients tell a similar story to the main result of the paper. Immigrant households reacted to network access assimilating with a larger magnitude than white native households. This was especially true for male children. However, while the relative distances in magnitudes are similar between the two samples, I find that the overall size of coefficients is smaller than what I find in my baseline sample. The same applies to black households. In Table 11 I show that African-Americans families exposed to radio networks were more likely to use nationally popular white names. Also here the magnitude of the effect is smaller than the one I document using my baseline sample. I replicate the rest of my results on *Whiteness* indexes for immigrant and black households in the Appendix.

7 Conclusion

In this paper, I have explored the impact of the first mass media at-large on cultural assimilation and homogenization during the interwar period in the United States. Exploiting within cities variation in naming patterns over time, I provided evidence that access to radio networks homogenized American culture through the assimilation of all households towards white native mainstream culture.

I have focused on the expansion of national radio networks that covered the country with homogenous programming. Radio networks promoted a homogenous cultural standard representative of white mainstream America rather than local identities. Mass advertisement, national news and shows played a key role in breaking down geographic and cultural barriers to create a common national identity around white native culture. The rise of the radio networks generated the first uniform media platform in American history, which — especially for rural areas — was the first accessible outlet of mass culture produced in the metropolis of the country.

To investigate the impact of radio networks on cultural change, I have linked novel data on radio stations to U.S. household characteristics. In order to know when and where Americans could listen to the networks, I borrowed a signal propagation model suitable to AM technology, the only available during the interwar period. Using this model, I reconstructed radio network coverage across the country and over time and link it to an established proxy for culture: naming patterns for U.S. children.

Households exposed to network radio were more likely to use popular white names from birth cohorts prior to radio expansion. While radio networks had a positive effect on all the households, black and immigrant families exhibited stronger assimilation, as large as six times the effect for natives. Within white native households the results are larger for daughters, while the opposite is true for immigrants and African–Americans. In addition to increasing the spread of top white native names, radio networks increased the likelihood that black and immigrant families assigned names more distinctively associated to white children. Taken together, white, immigrant and black households all mutated their naming decisions towards white native naming patterns, homogenizing naming patterns during the interwar period.

Finally, I have used baseball player names to provide evidence over one possible mechanism at play behind the result on assimilation into American mainstream culture. I showed that radio changed U.S. families' naming decision by directly providing names to assign their offspring. Households responded by naming their sons after baseball players. On the contrary, girls became less likely to be named after baseball players upon families' connection to radio networks, highlighting another important dimension through which media can affect identity. To highlight that radio was not just selling names, but also an ideal of success tied to it, I decomposed the effect of network access by how successful baseball players were. I highlighted that immigrant households bought names independently of how successful players were. Instead, native families only used names of players that featured in the All-Star games.

How else did radio networks affect American society during the interwar period? In another contribution I investigate whether the democratization of media access translated into the homogenization of political preferences. I show that network access increased turnout, reduced political competition and rose the similarity between these two voting outcomes at the county level data and the national average. In future research I will complement this results by focusing on the effect that radio played in the rise of African-American political activism.

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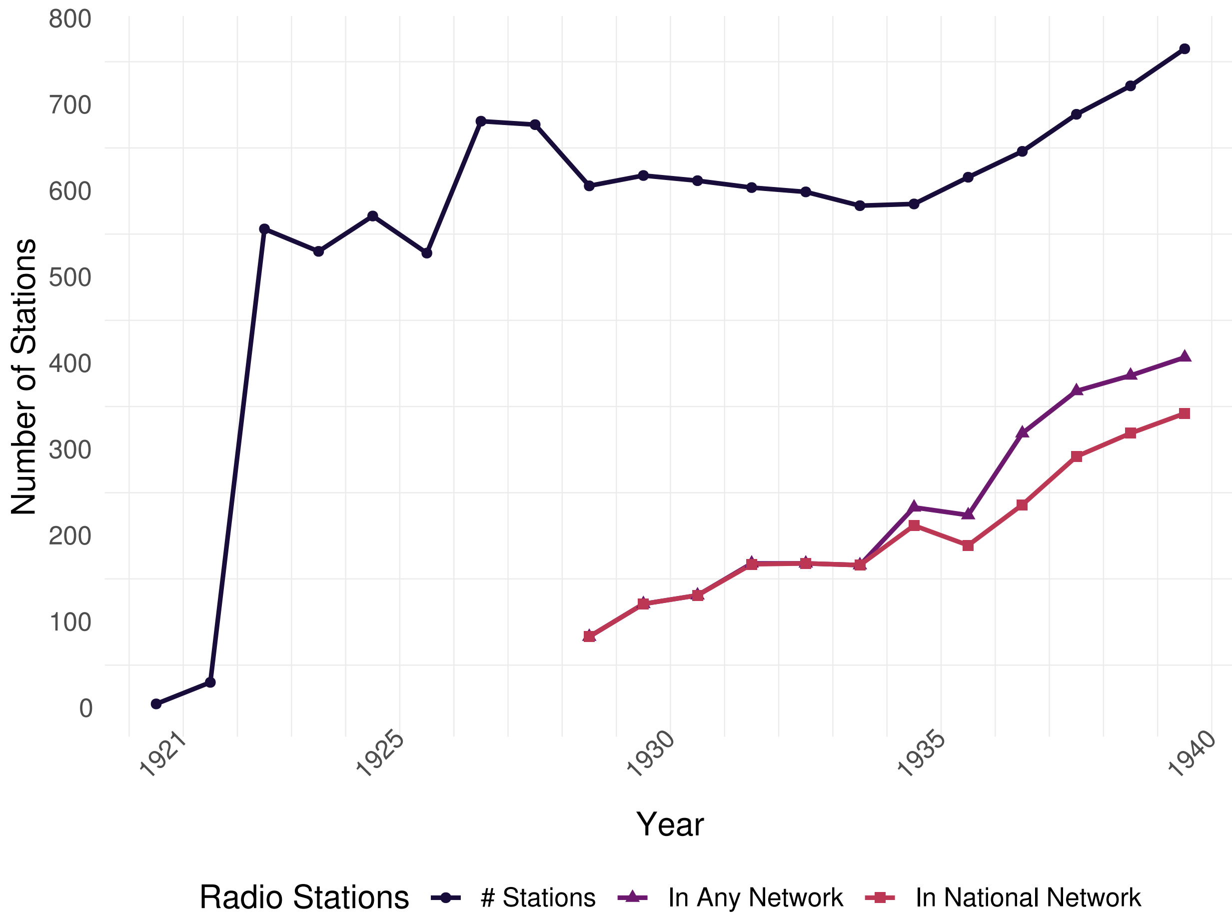
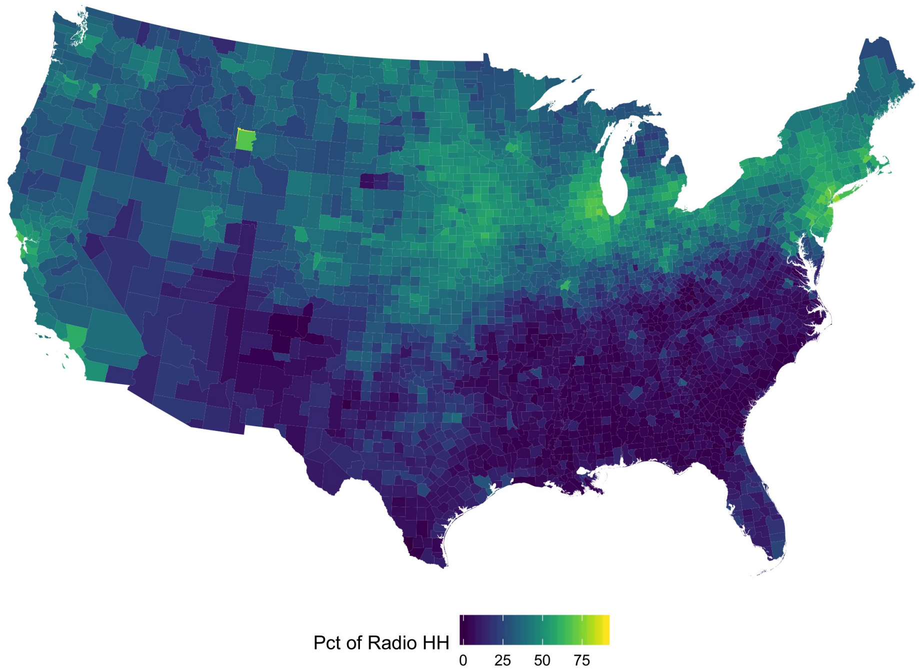
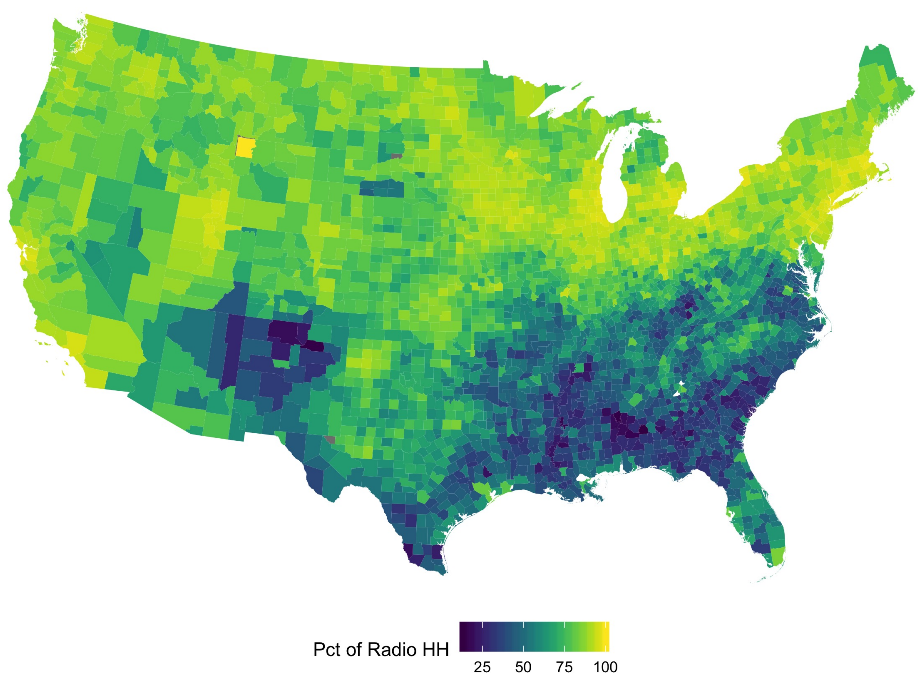


Figure 1: The number of radio stations increased over time. From 1927, stations started becoming affiliated to networks. NBC, CBS and MBS were the major national networks. During the same period, other small regional networks were formed but they represented only a small fraction of the stations affiliated.



(a) Share of Households With a Radio Set in 1930



(b) Share of Households With a Radio Set in 1940

Figure 2: Share of households that owned a radio set at the county level in 1930 and 1940. Source: Manson et al. (2019)

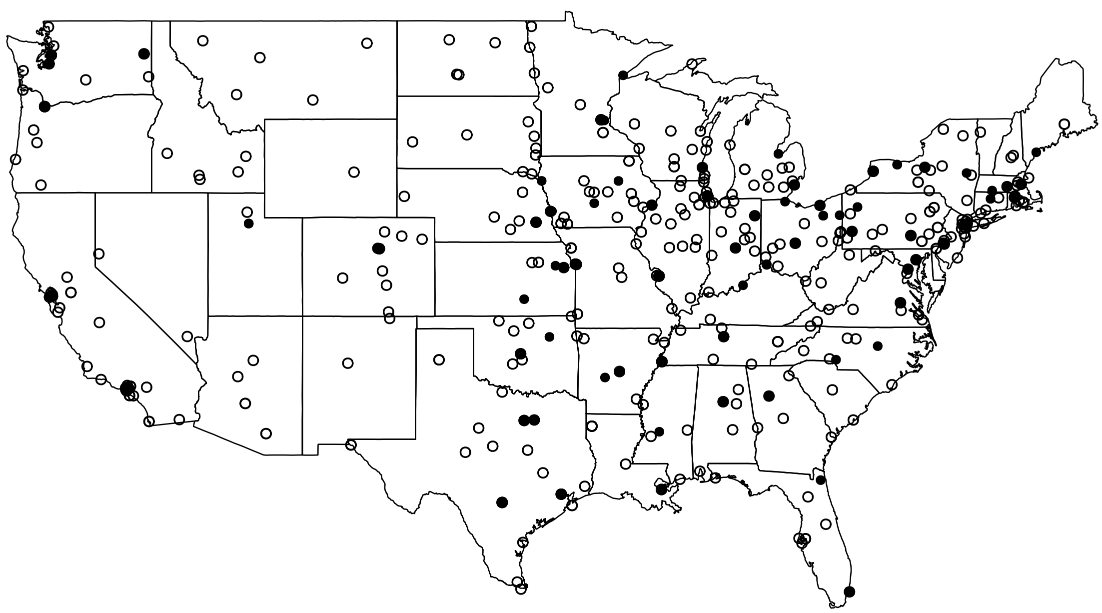


Figure 3: Location of U.S. cities with at least one active radio station in 1930. Filled dots are cities where at least one station is network affiliated, whereas empty dots have none.

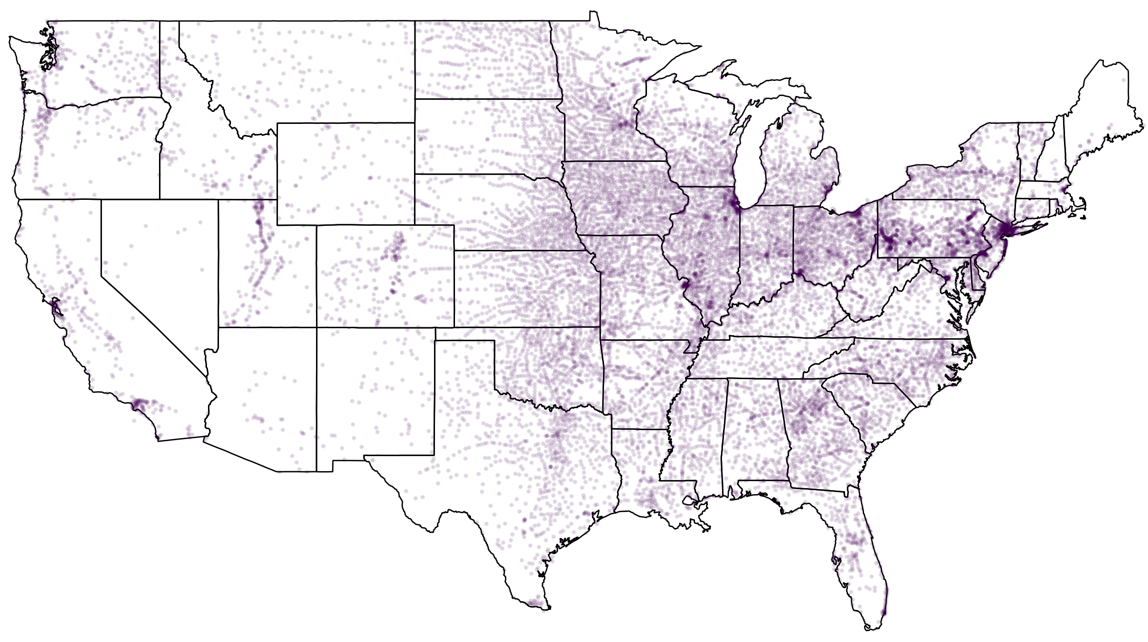


Figure 4: Map of locations where U.S. household declared to reside. Each point is a city or town that at least one household in my sample declared residing in. My main sample is composed by households that resided in these locations.

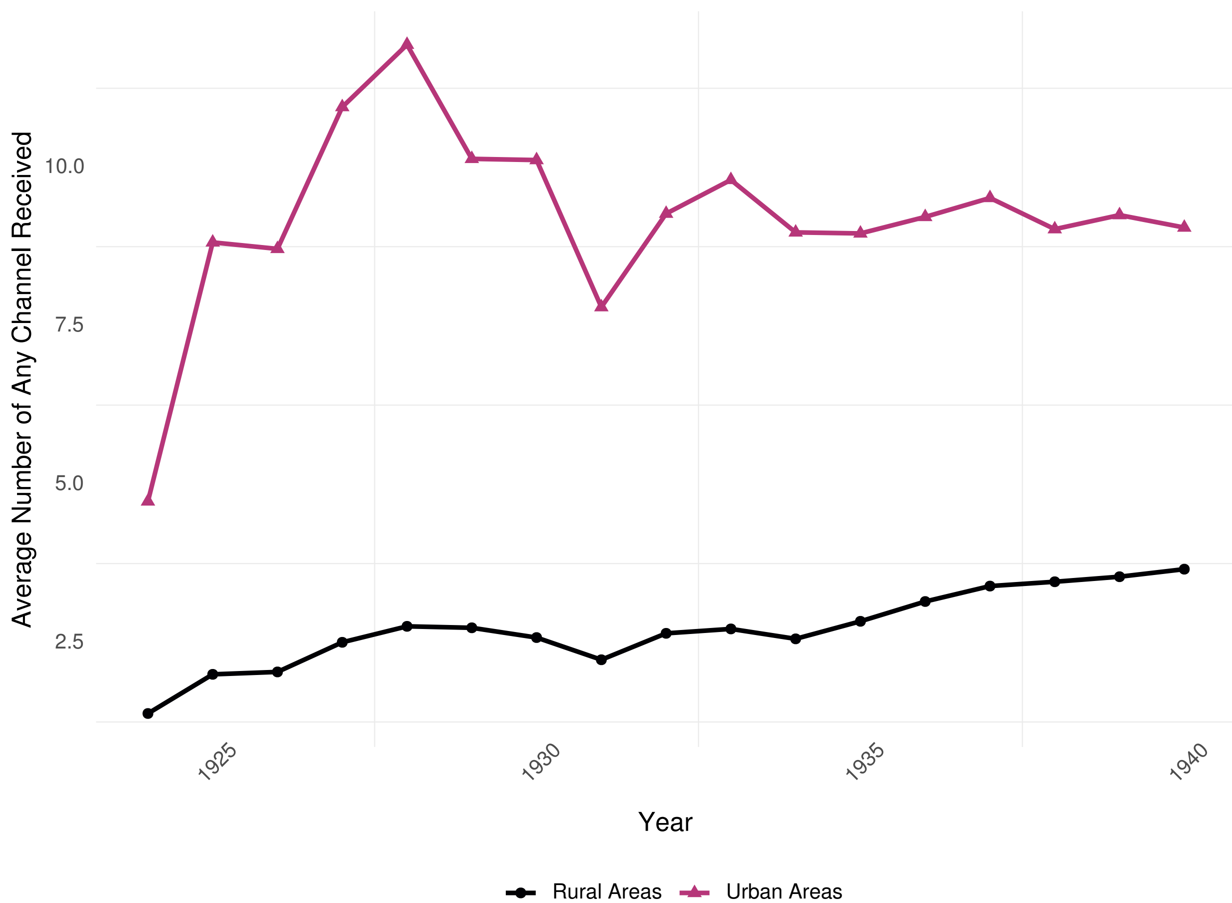


Figure 5: On average, the number of all channels available grows over time. However, there is great variation in radio exposure between rural and urban areas. While urban areas had access on average to 10 radio channels in 1940, rural areas had access to only 3. The dip in the number of radio channels available during the early 1930s is due to the change in regulation which restricted the total number of stations that could broadcast. The same reduction is evident in Figure 1, where I plot the number of stations actively broadcasting in the country.

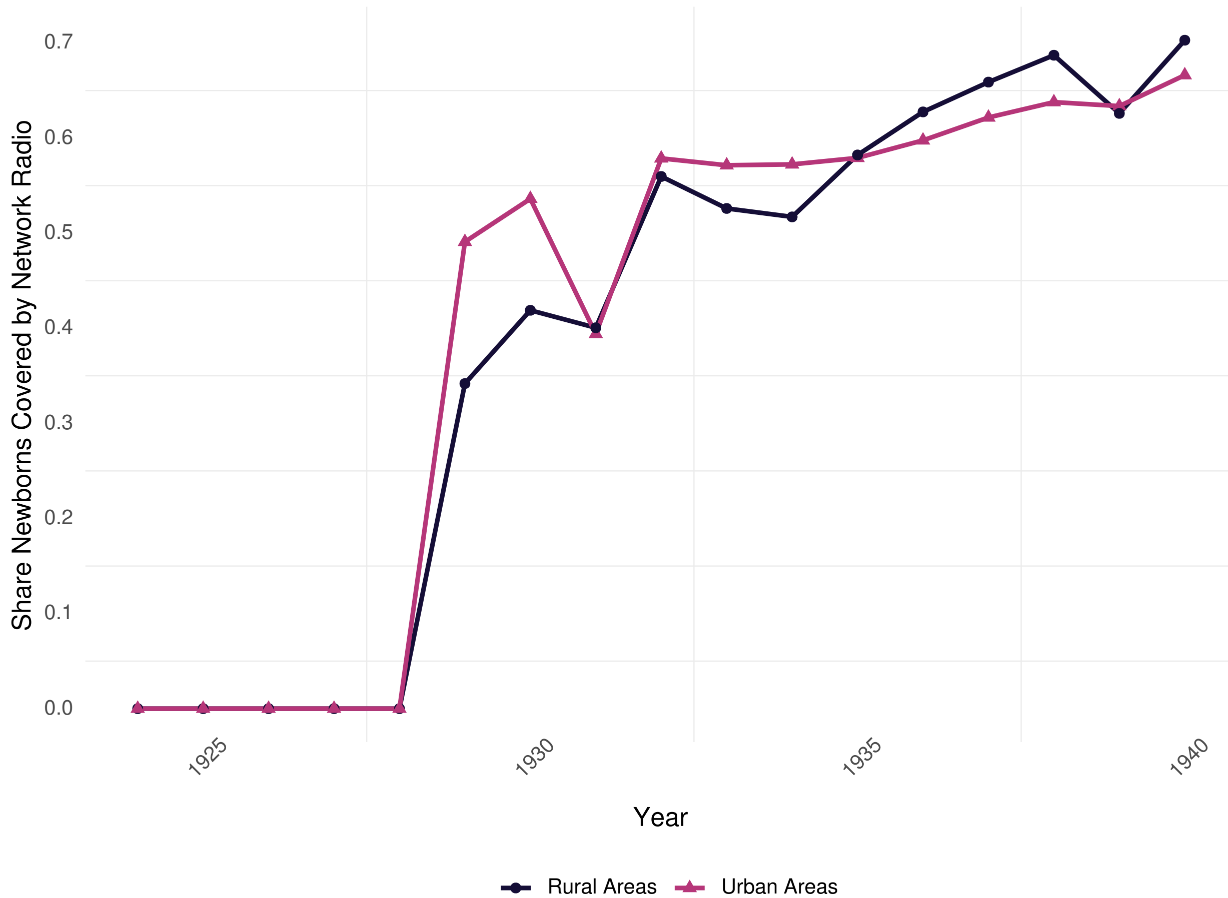


Figure 6: The share of newborns in my sample covered by network radio grows over time. Despite the few radio channels available to rural areas, by the end of the study period, over 70% of families had access to a network channel.

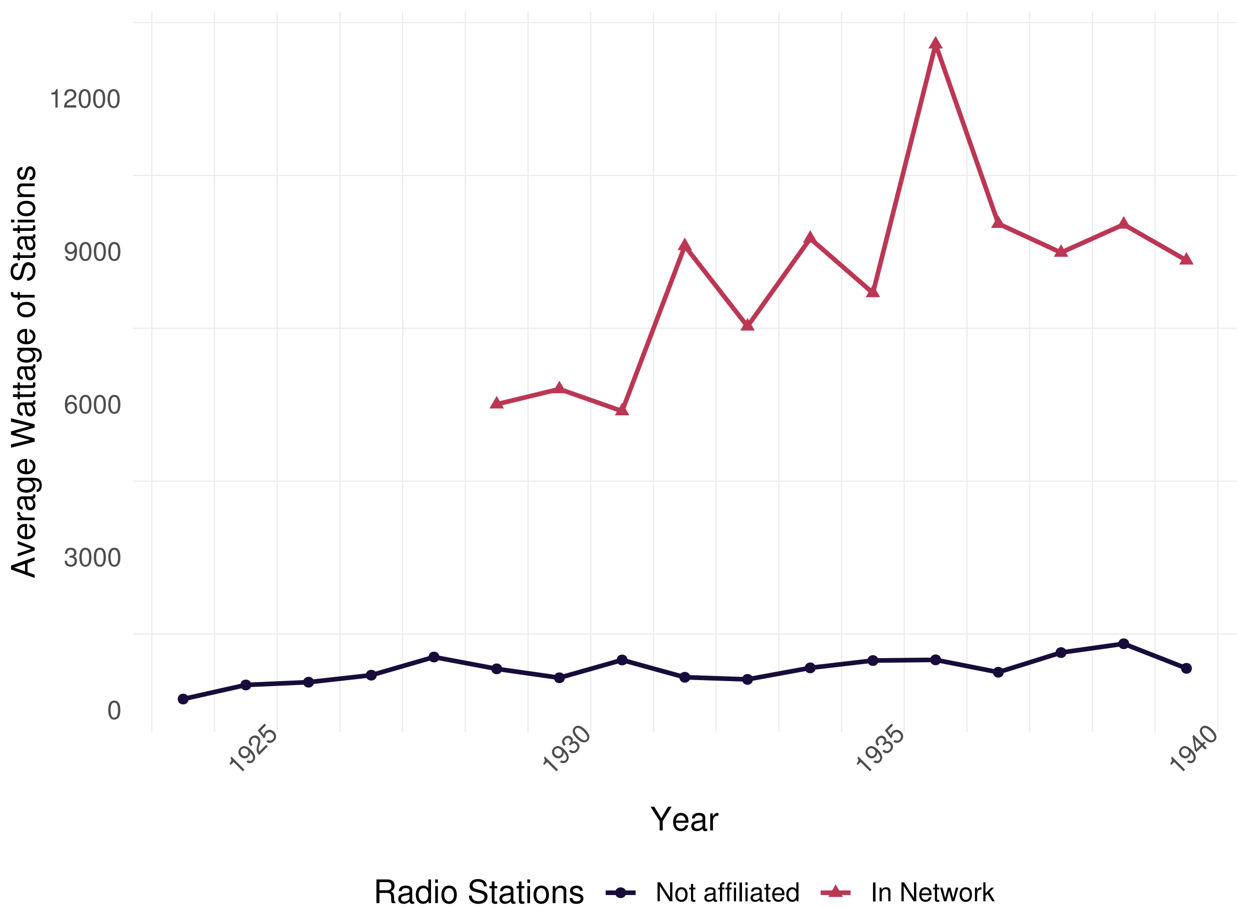
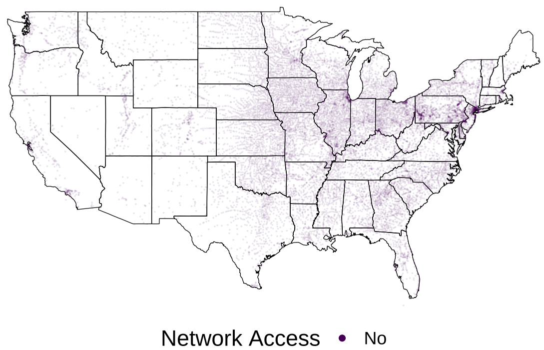
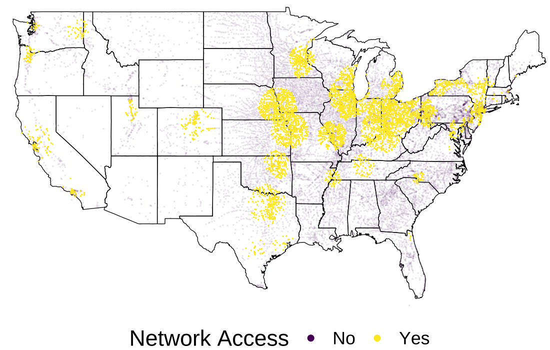


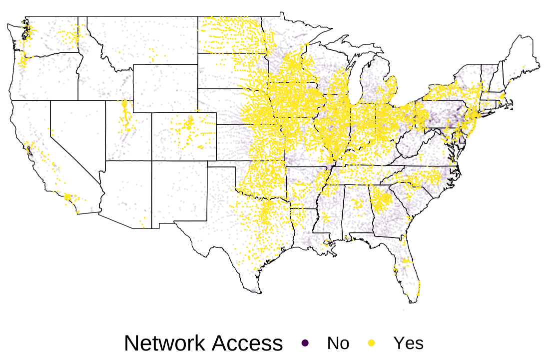
Figure 7: The average wattage of stations affiliated to national networks was vastly larger than that of non-affiliated stations.



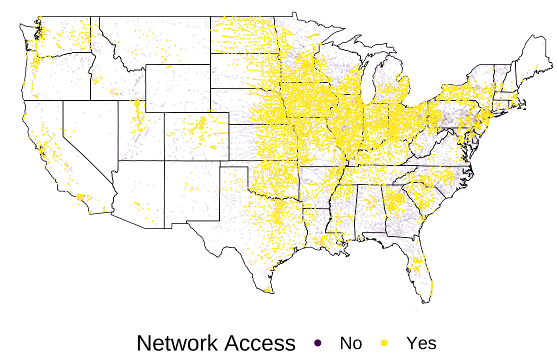
(a) Network Access 1925



(b) Network Access 1930



(c) Network Access 1935



(d) Network Access 1940

Figure 8: Network Coverage Expanded Across the Country over the Interwar Period. Click here to see an animated version of the map.

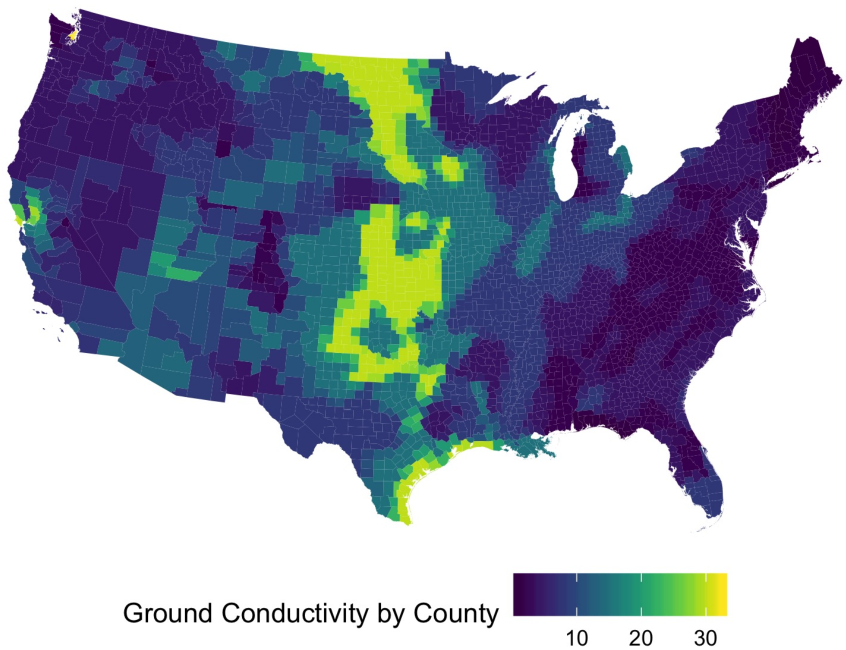


Figure 9: Map of ground conductivity at the county level. Ground conductivity is the electrical conductivity of the subsurface of the earth. It is the most important factor in determining coverage area in ground wave propagation for medium and low frequencies, the same frequencies used by AM radio during the interwar period.

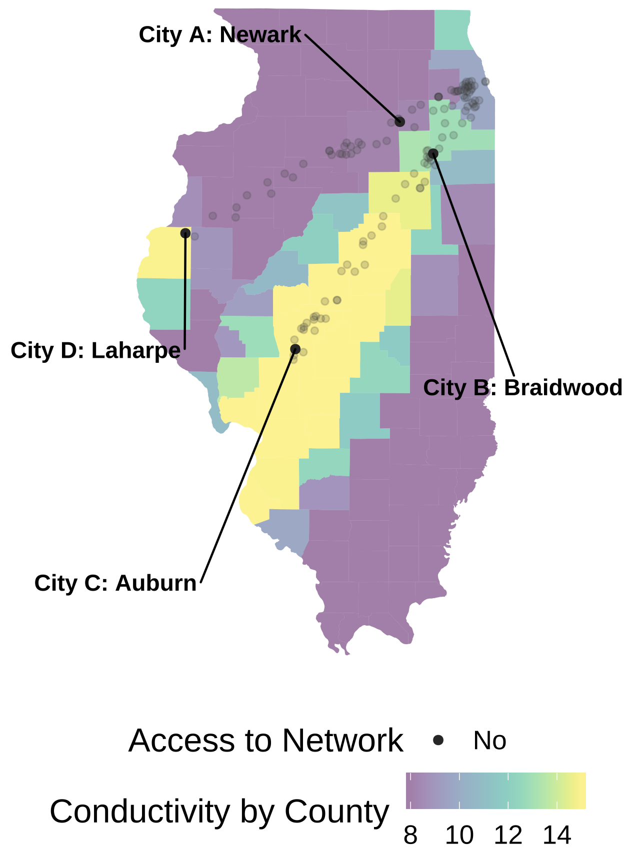
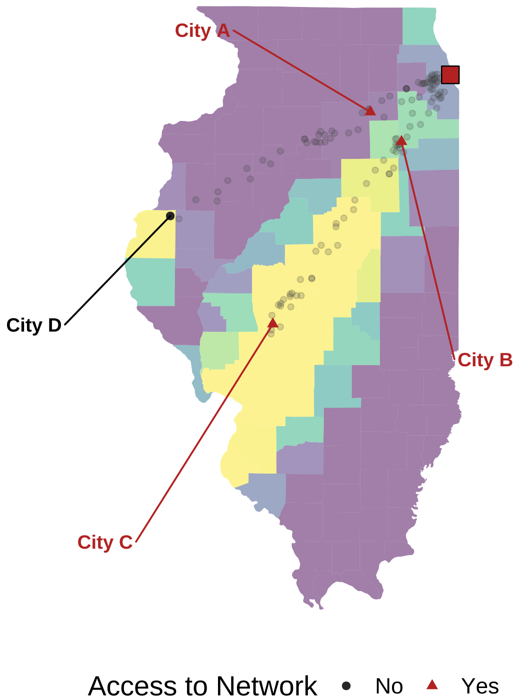
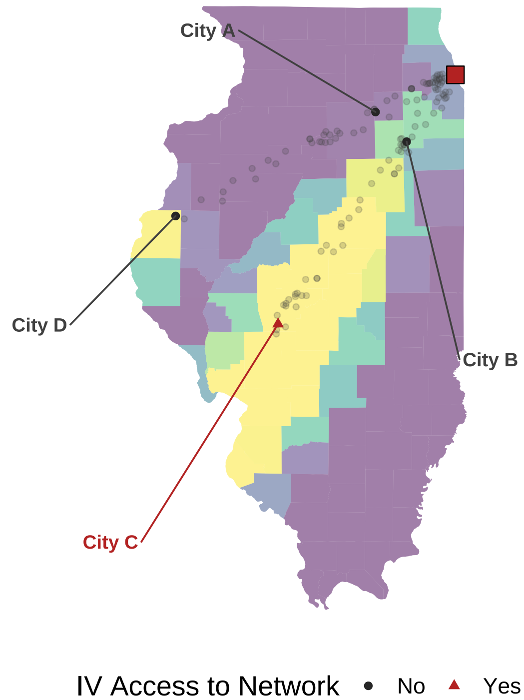


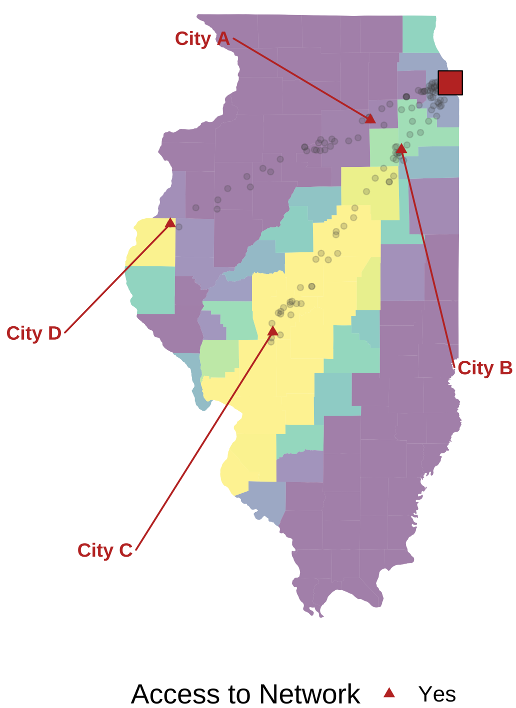
Figure 10: Example of Empirical Strategy Focusing on Illinois' Ground Conductivity. To explain my empirical strategy I look at the network variation experience induced by the stations in Chicago on four towns in Illinois: Newark (A), Braidwood (B), Auburn (C), Laharpe (D). At time 0, when Chicago does not have a station, all towns are not treated.



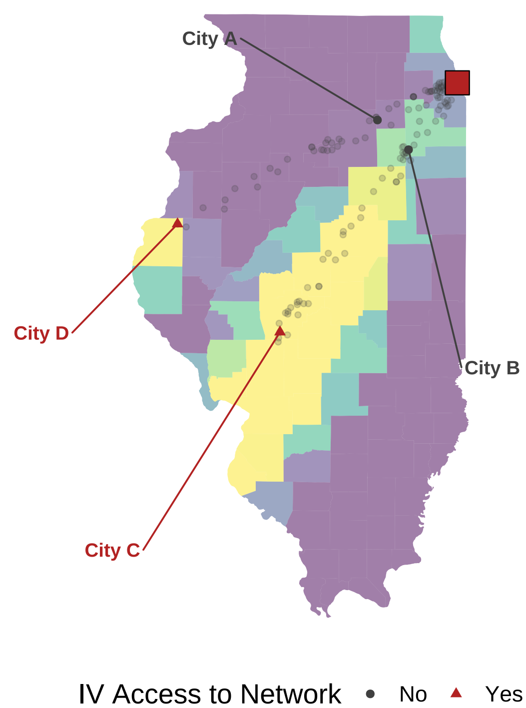
(a) Treatment Variation at t = 1



(b) Instrument Variation at t = 1



(c) Treatment Variation at t = 2



(d) Instrument Variation at t = 2

Figure 11: Example of Empirical Strategy Focusing on Illinois' Ground Conductivity. To explain my empirical strategy I look at the network variation experience induced by the stations in Chicago on four towns in Illinois: Newark (A), Braidwood (B), Auburn (C), Laharpe (D). As the stations in Chicago becomes more powerful, towns in Illinois gets access to network signal. However, some get earlier access because on a better conductivity path than others.

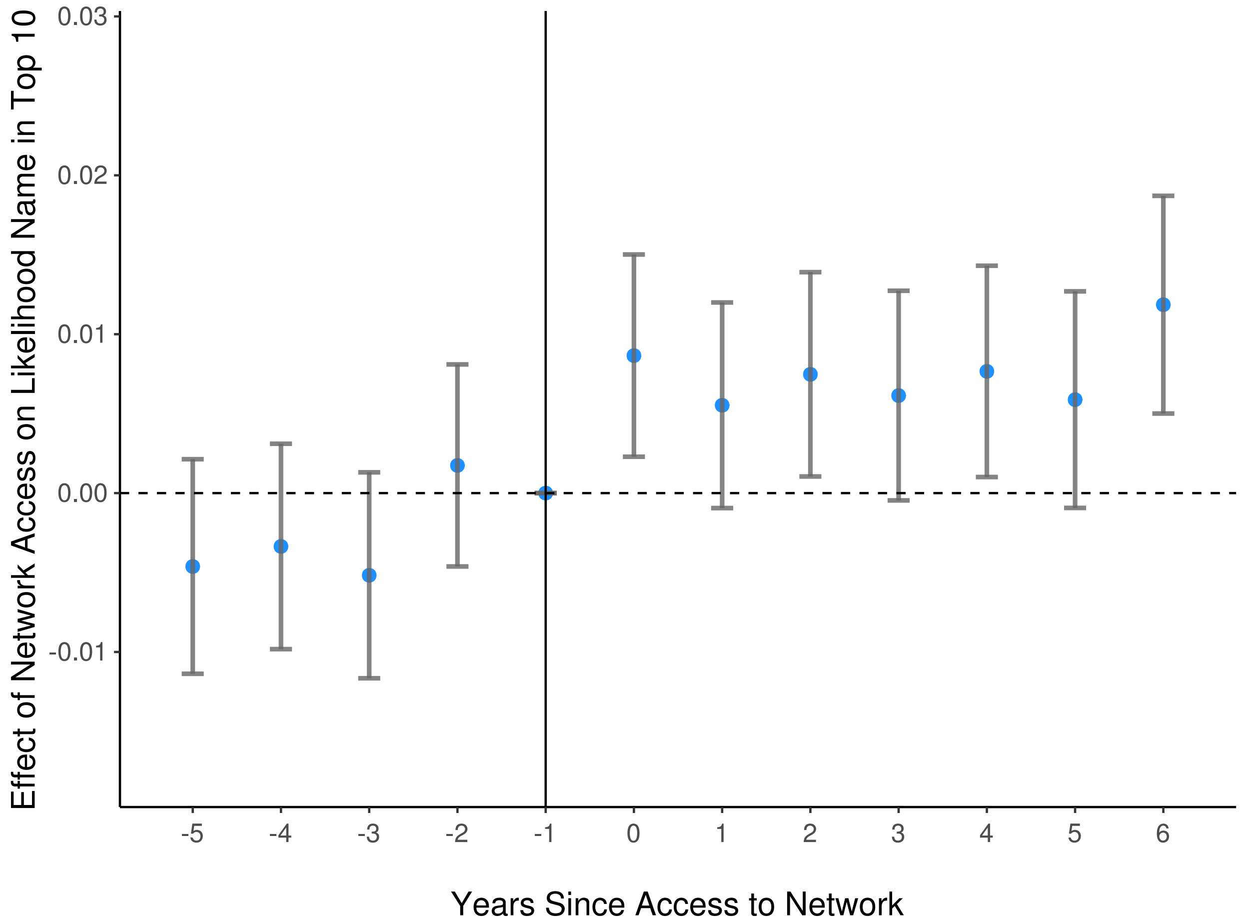


Figure 12: Estimated Effect Of Years Since Network Access On the Probability To Assign a Top White Native Name (Event Study). Network access constructed using only stations located farther than the median distance from receiving locations. Birth cohorts used to generate top 10 names pooled from 1890 and 1900. Sample includes only white children. All regressions include city, birth cohort fixed effects. I cluster standard errors at the city level, the treatment level.

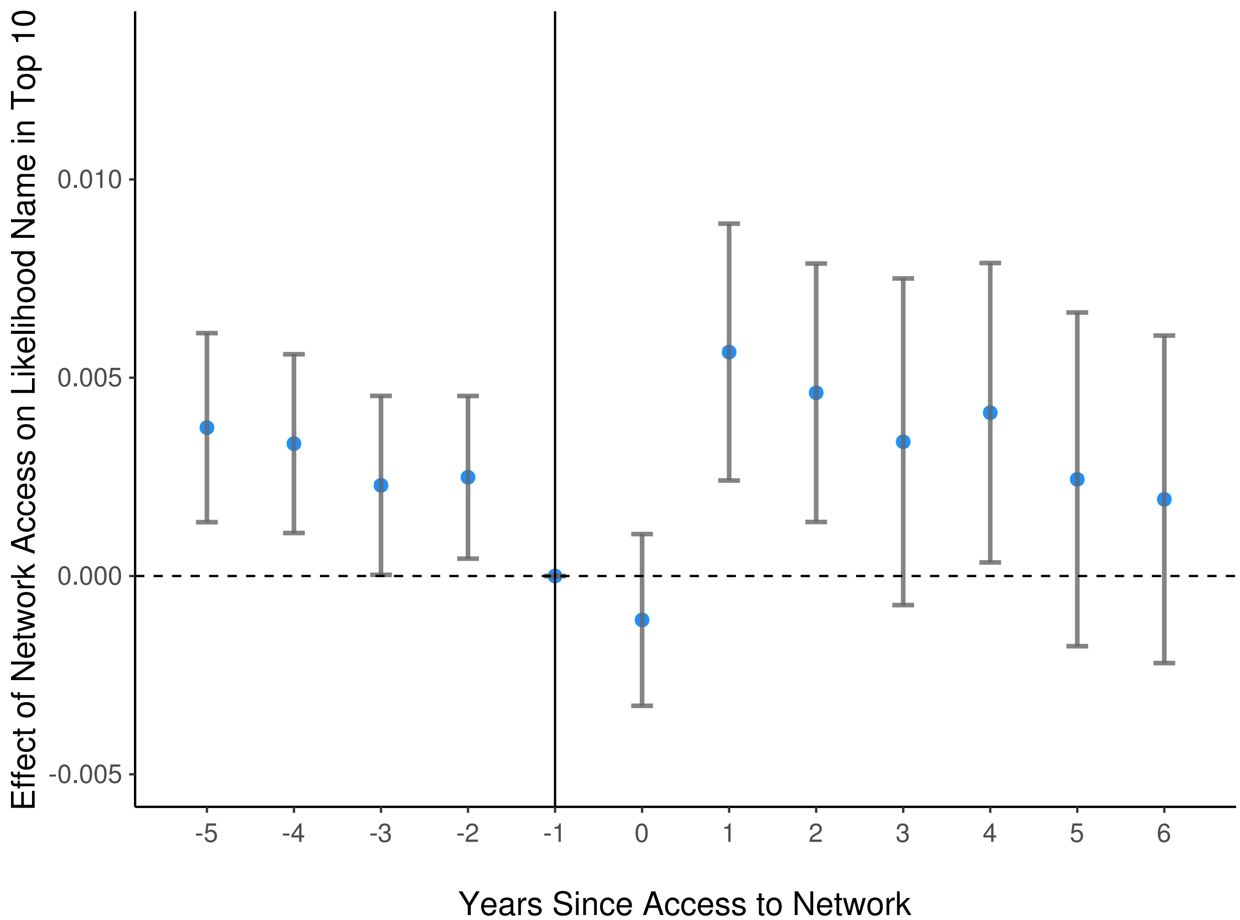


Figure 13: Estimated Effect Of Years Since Network Access On the Probability To Assign a Top White Native Name (Event Study). Network access constructed using all stations. Birth cohorts used to generate top 10 names pooled from 1890 and 1900. Sample includes only white children. All regressions include city, birth cohort fixed effects. I cluster standard errors at the city level, the treatment level.

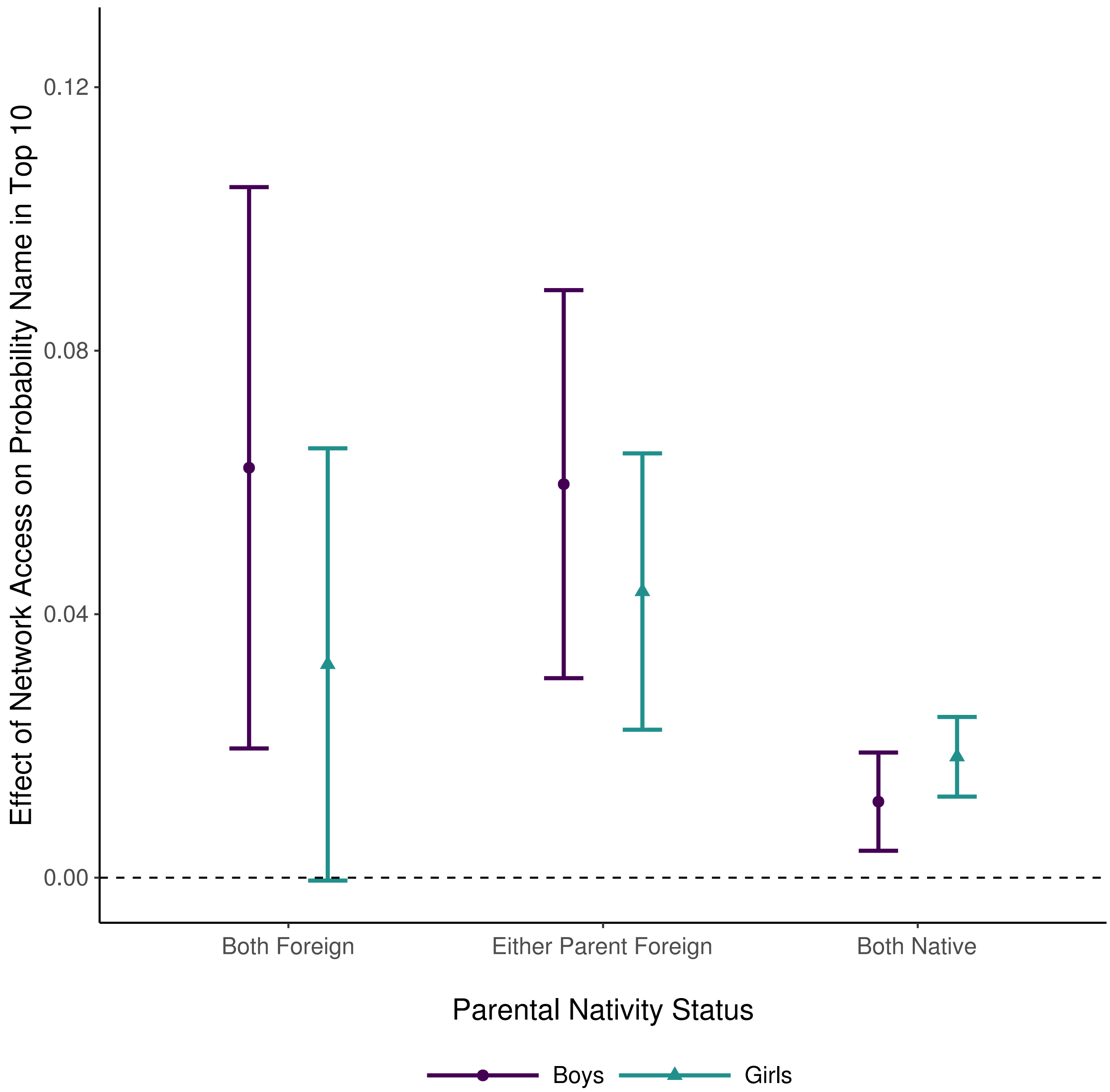


Figure 14: Estimated effect network access on the likelihood that a name is drawn from the top ten names of the white native birth cohort. Coefficients plotted by gender and nativity status of the parents. Birth cohorts used to generate top 10 names are pooled from 1890 and 1900. Sample includes only white children. All regressions include city, birth cohort fixed effects and a range of household controls. I cluster standard errors at the city level, the treatment level. Main controls include home ownership, age of household head at child birth, occupational score of household head and household head employment status.

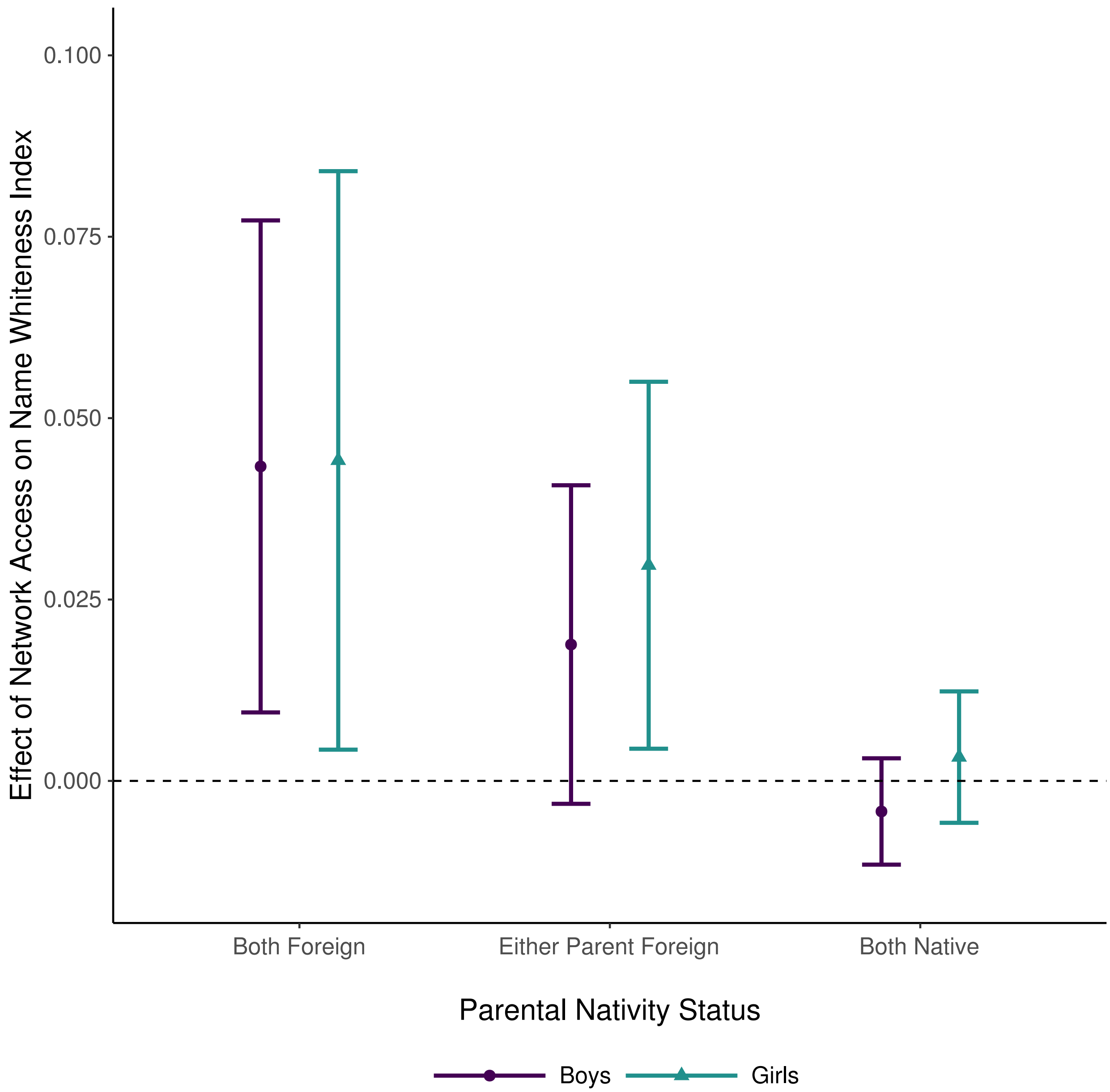


Figure 15: Effects of Radio Network Access on Name Whiteness Index by Parental Nativity Status. Results suggest that network radio led immigrant households to assign names that were more likely to be associated with a white American born child rather than an immigrant child. Whiteness Index computed from 1920 birth cohort. This sample only includes children with non missing city or town of residence. Following Abramitzky et al. (2018) coefficients come from a model with households fixed effects

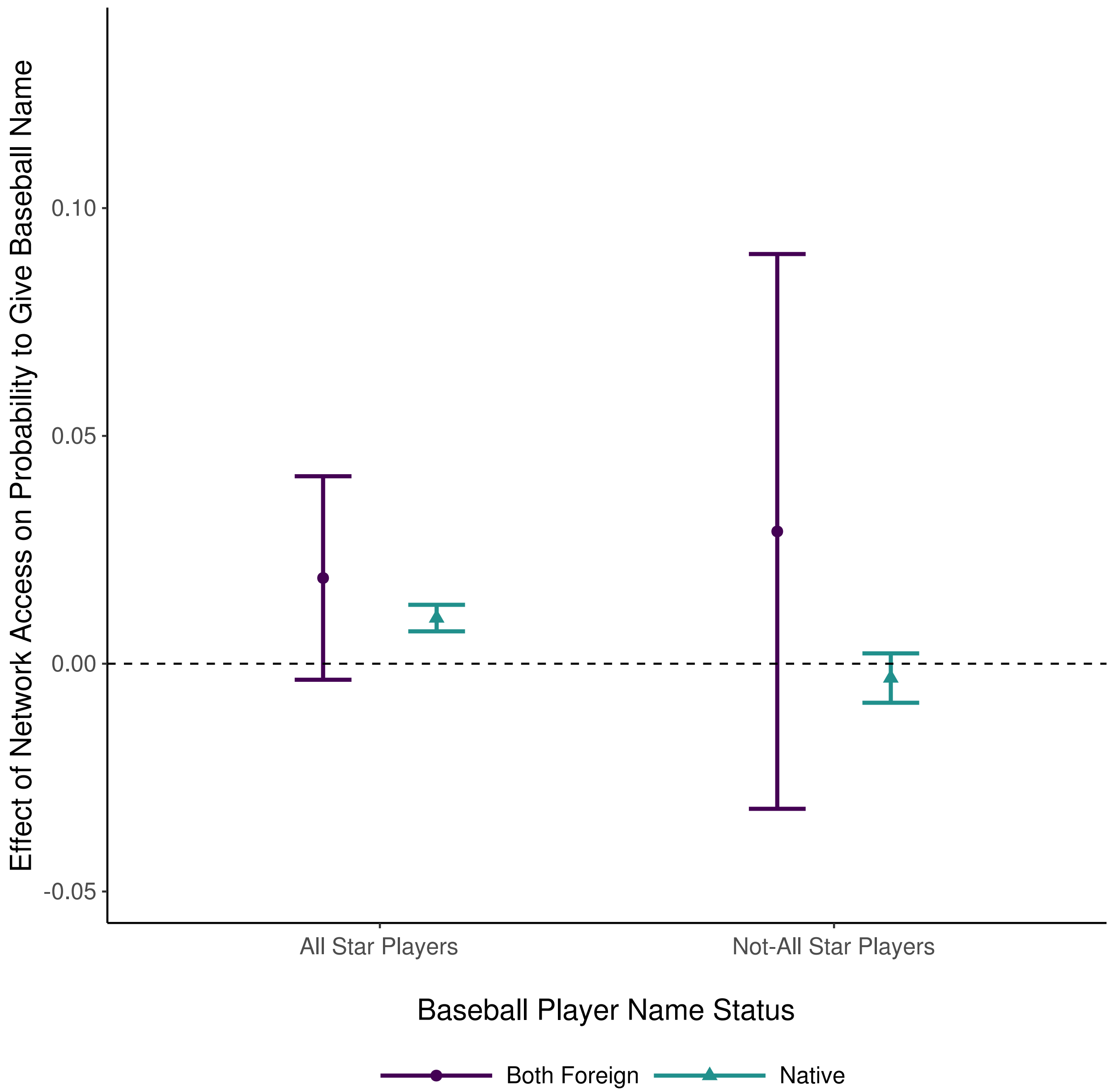


Figure 16: Estimated effect of network access on likelihood of naming after baseball players by successfulness of player and parental nativity status. Baseball players' names used are those of players active during the same year the child was born. Successful players are defined as those who were playing in the All-Star games. Sample composed by white children only. All regressions include city, birth cohort fixed effects and a range of household controls. I cluster standard errors at the city level, the treatment level. Main controls include home ownership, age of household head at child birth, occupational score of household head, household head employment status and household head nativity status.

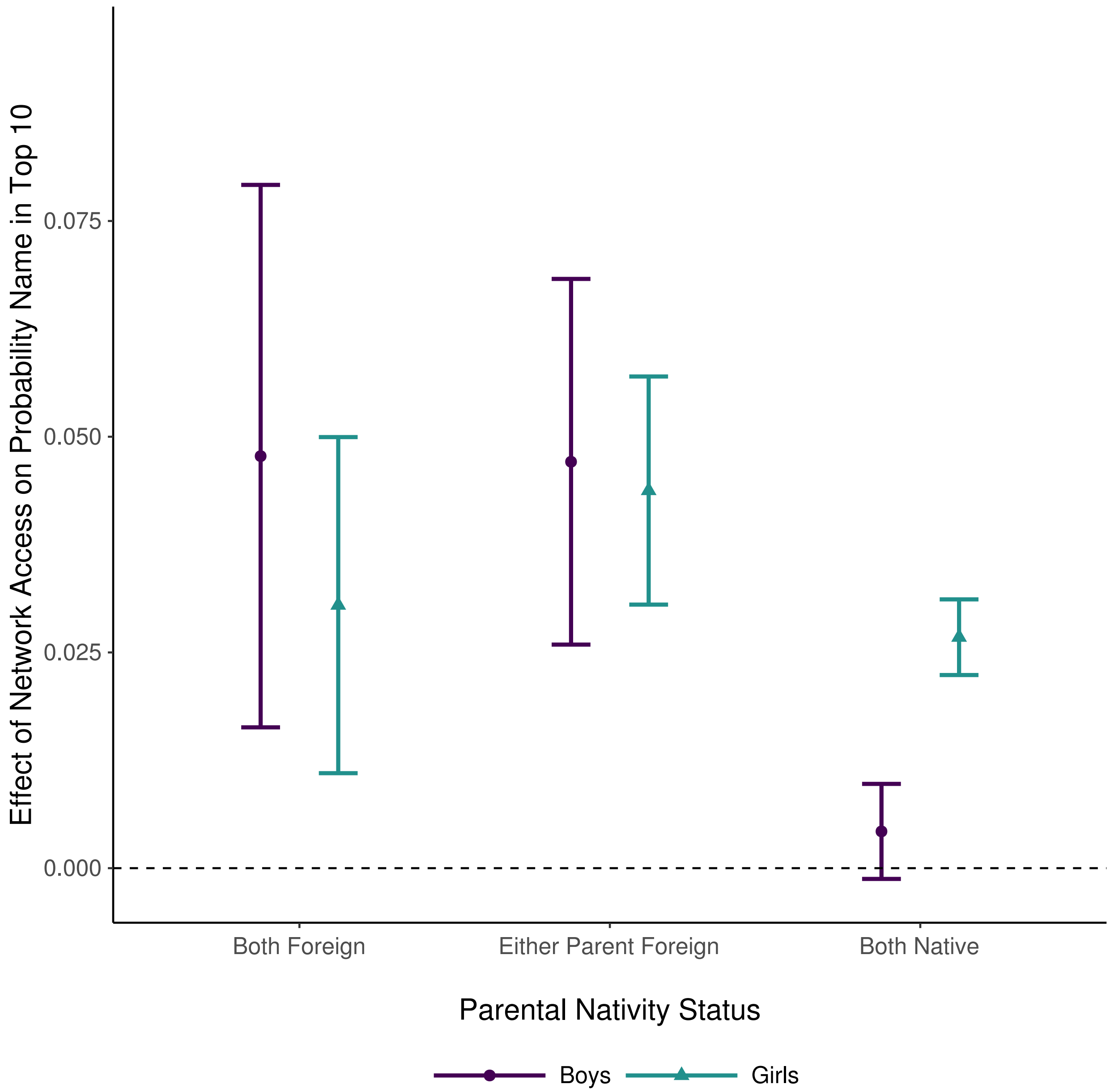


Figure 17: Estimated effect radio network access on the likelihood that a name chosen locally during the Golden Age of Radio is drawn from the top 10 names of the white native birth cohort. Coefficients by gender of child and nativity status of parents. Sample includes the universe of white children born between 1924 and 1940. For the children with missing information on location of residence I locate them at the county centroid. Birth cohorts used to generate top 10 names are pooled from 1890 and 1900. All regressions include city, birth cohort fixed effects and a range of household controls. Main controls include home ownership, age of household head at child birth, occupational score of household head and household head employment status. I cluster standard errors at the city level, the treatment level.

Table 1: The Geolocated Sample is Not Representative of the Full Count Census. Sample Over Which IV Varies is Representative of Rural and Small Town America

	Full Count	Geolocated Sample	IV Variation Sample
	(1)	(2)	(3)
Male	0.51	0.51	0.51
	(0.50)	(0.50)	(0.50)
White	0.88	0.91	0.95
	(0.33)	(0.29)	(0.21)
Native Household Head	0.86	0.81	0.95
	(0.35)	(0.39)	(0.22)
Age Household Head	31.63	27.73	28.43
	(13.64)	(9.3)	(9.78)
Employed Household Head	0.93	0.93	0.92
	(0.25)	(0.26)	(0.28)
Family Size	5.72	5.34	5.45
	(2.29)	(2.12)	(2.07)
Number of Siblings	2.38	2.02	2.22
	(2.11)	(1.92)	(1.97)
Own Home	0.36	0.34	0.41
	(0.48)	(0.47)	(0.49)
Urban	0.48	0.87	0.02
	(0.51)	(0.34)	(0.15)

Note: Descriptive statistics on three samples of U.S. newborns are extracted from full count census. All samples include 1924 to 1929 birth cohorts extracted from 1930 census and 1930 to 1940 birth cohorts extracted from 1940 census. First column gives descriptives of the universe of children born in the U.S. between 1924 and 1940 who were still alive at the census years. Second column describes sample with non-missing information on city or town of residence, sample size is 19,640,567 children. Third column describes sample over which my instrument, signal propagation from far stations, exhibits variation over time.

Table 2: Top 10 White Names by Gender Across Birth Cohorts

	Male Names		
	1880	1910	1940
1	William	William	William
2	James	James	James
3	Charles	Charles	Charles
4	Edward	Edward	John
5	George	George	Thomas
6	John	John	David
7	Frank	Frank	Richard
8	Harry	Robert	Robert
9	Henry	Joseph	Donald
10	Joseph	Walter	Ronald
	Female Names		
1	Mary	Mary	Mary
2	Ida	Dorothy	Dorothy
3	Annie	Mildred	Margaret
4	Elizabeth	Elizabeth	Barbara
5	Margaret	Margaret	Joan
6	Minnie	Ruth	Shirley
7	Alice	Alice	Nancy
8	Emma	Florence	Patricia
9	Bertha	Helen	Carol
10	Anna	Anna	Judith

Note: Most popular names in 1880, 1910 and 1940 white native birth cohorts by gender. Calculations of the author using data from the US full count Census.

Table 3: Example of Most Foreign, Black and White Native Names, 1920

	Ten Most Black Names	
	Male Names	Female Names
1	Mose	WillieLee
2	Elizah	Evelena
3	Nathaniel	WillieMay
4	Ivory	Liza
5	Nathanial	Savannah
6	Isaiah	Ceola
7	WillieLee	Luvenia
8	Roosevelt	Magnolia
9	Isiah	Pinkie
10	Booker	Queen
	Ten Most Foreign Names	
	Male Names	Female Names
1	Gust	Astrid
2	Erie	Lucienne
3	Luigi	Greta
4	Fritz	Germaine
5	Eric	Gerda
6	Erick	Ingrid
7	Gunnar	Bridget
8	Hans	Sonia
9	Erich	Herta
10	Kurt	Bridie
	Ten Most White Native Names	
	Male Names	Female Names
1	Arlie	Allene
2	Buford	Belva
3	Coy	Clyde
4	Doyle	Floy
5	Garland	Johnnie
6	Grady	Myrtie
7	Odell	Odessa
8	Thurman	Retha
9	Wilburn	Rubie
10	Wiley	Vergie

	Ten Most Foreign Names	
	Male Names	Female Names
1	Gust	Astrid
2	Erie	Lucienne
3	Luigi	Greta
4	Fritz	Germaine
5	Eric	Gerda
6	Erick	Ingrid

Table 4: Network Access from Far Stations is a Strong Predictor of Overall Network Access

	Network Access			
	White		Black	
	Male	Female	Male	Female
	(1)	(2)	(3)	(4)
Exogenous Network Access	0.565***	0.567***	0.607***	0.617***
	(0.014)	(0.015)	(0.020)	(0.020)
Controls	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
F Stat	1524	1491	883	935
Observations	7,249,387	6,641,657	644,446	653,048
Adjusted R^2	0.735	0.732	0.718	0.714
Mean of Outcome	0.405	0.396	0.379	0.362

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Estimated effect of access to radio networks induced by signal propagating from stations further than median distance (112 km) on the likelihood of receiving any radio network signal. All regressions include city and birth cohort fixed effects and a range of household controls. Main controls include home ownership, age of household head, occupational score of household head, household head employment status and household head nativity status. I cluster standard errors at the city level, that is at the treatment level. I construct my sample from the 1930 and 1940 full count census waves. To diminish attrition, I retrieve the 1920s birth cohorts from the 1930 census and the 1930s birth cohorts from the 1940 census wave. The sample includes all children for whom I could geolocate the city of residence at census year.

Table 5: Network Access Assimilated White Households to White Native Names from the Early 1900s

	1{In top 10 names from 1900s birth cohort}			
	Boys		Girls	
	(1)	(2)	(3)	(4)
Access to Network Radio	0.010***	0.010***	0.018***	0.017***
	(0.004)	(0.003)	(0.003)	(0.003)
Access to Non-Network Radio		0.001		0.009**
		(0.004)		(0.004)
Controls	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	7,249,387	7,249,387	6,641,657	6,641,657
Adjusted R^2	0.021	0.021	0.025	0.025
Mean of Outcome	0.265	0.265	0.161	0.161

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Estimated Effect of Access to Radio Networks on the Likelihood That a Name is Drawn From Top 10 Most Popular White Native Names. Birth cohorts used to generate top 10 names are pooled from 1890 and 1900. All regressions include city and birth cohort fixed effects and a range of household controls. Main controls include home ownership, age of household head at child birth, occupational score of household head, household head employment status and household head nativity status. I cluster standard errors at the city level, i.e. at the treatment level. I construct my sample from the 1930 and 1940 full count census waves. To diminish attrition I retrieve the 1920s birth cohorts from the 1930 census and the 1930s birth cohorts from the 1940 census wave. The sample includes all children for whom I could geolocate the city of residence at census year.

Table 6: Network Access Assimilated Black Households to White Native Names from the Early 1900s

	1{In top 10 names from 1900s birth cohort}			
	Boys		Girls	
	(1)	(2)	(3)	(4)
Access to Network Radio	0.038***	0.038***	0.029***	0.028***
	(0.014)	(0.014)	(0.010)	(0.011)
Access to Non-Network Radio		0.004		−0.008
		(0.015)		(0.012)
Controls	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	654,307	654,307	653,048	653,048
Adjusted R^2	0.021	0.021	0.014	0.014
Mean of Outcome	0.252	0.252	0.142	0.142

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Estimated Effect of Access to Radio Networks on the Likelihood That a Name is Drawn From the Top 10 Names of the White Native Birth Cohort. Birth cohorts used to generate top 10 names pooled from 1890 and 1900. Sample composed of black households only. All regressions include city and birth cohort fixed effects and a range of household controls. Main controls include home ownership, age of household head at child birth, occupational score of household head, household head employment status and household head nativity status. I cluster standard errors at the city level, i.e. the treatment level. I construct my sample from the 1930 and 1940 full count census waves. To diminish attrition I retrieve the 1920s birth cohorts from the 1930 census and the 1930s birth cohorts from the 1940 census wave. The sample includes all children for whom I could geolocate the city of residence at census year.

Table 7: Radio Networks Increased *Whiteness* Index of Names for Treated Black Children

	Whiteness Index			
	Male		Female	
	(1)	(2)	(3)	(4)
Access to Network	0.020***	0.009	0.031***	0.030*
	(0.007)	(0.016)	(0.008)	(0.017)
Access to Network × White	−0.014***	−0.013***	0.006***	−0.001
	(0.001)	(0.004)	(0.002)	(0.004)
Controls	Yes	Yes	Yes	Yes
City FE	Yes	No	Yes	No
Household FE	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	6,686,521	6,969,158	6,320,201	6,591,707
Adjusted R^2	0.054	0.096	0.089	0.146
Mean of Outcome	0.385	0.386	0.286	0.288

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Estimated effect of Network Access on Names' Whiteness Index. All specifications use full sample with interactions for race. Whiteness index computed on 1920 birth cohort. All regressions include birth cohort fixed, city or household fixed effects as reported in table and a range of household controls. Main controls include home ownership, age of household head at child birth, occupational score of household head, household head employment status and household head nativity status. I cluster standard errors at the city level, i.e. the treatment level. I construct my sample from the 1930 and 1940 full count census waves. To diminish attrition I retrieve the 1920s birth cohorts from the 1930 census and the 1930s birth cohorts from the 1940 census wave. The sample includes all children for whom I could geolocate the city of residence at census year.

Table 8: Radio Networks Increased Likelihood of Naming After Baseball Players

	1{Baseball Name}	
	Boys	Girls
	(1)	(2)
Access to Network	0.018***	−0.002***
	(0.002)	(0.001)
Controls	Yes	Yes
City FE	Yes	Yes
Year FE	Yes	Yes
Observations	7,459,188	6,876,131
Adjusted R^2	0.025	0.006
Mean of Outcome	0.127	0.007

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Estimated effect of network access on likelihood to name after baseball players active during the same year the child was born. Sample composed by white children only. All regressions include city and birth cohort fixed and a range of household controls. Main controls include home ownership, age of household head at child birth, occupational score of household head, household head employment status and household head nativity status. I cluster standard errors at the city level, that is at the treatment level. I construct my sample from the 1930 and 1940 full count census waves. To diminish attrition I retrieve the 1920s birth cohorts from the 1930 census and the 1930s birth cohorts from the 1940 census wave. The sample includes all children for whom I could geolocate the city of residence at census year.

Table 9: Results On White Households Are Robust to Different Sample Restrictions

	1{In top 10 name from 1900s birth cohort}				
	Boys				
	(1)	(2)	(3)	(4)	(5)
Access to Network Radio	0.012***	0.013***	0.015***	0.010**	0.015***
	(0.004)	(0.004)	(0.005)	(0.004)	(0.006)
× Either Foreign	0.048***	0.046***	0.051***	0.058***	0.060***
	(0.013)	(0.014)	(0.014)	(0.015)	(0.017)
× Both Foreign	0.051***	0.054***	0.056***	0.040*	0.052**
	(0.019)	(0.020)	(0.021)	(0.022)	(0.024)
Sample restriction	None	Same SOB	No South	Firstborns	All
Controls	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	6,917,726	6,676,631	6,059,156	5,741,059	4,409,086
Adjusted R^2	0.020	0.021	0.021	0.020	0.021
Mean of Outcome	0.265	0.266	0.269	0.271	0.276

	1{In top 10 name from 1900s birth cohort}				
	Girls				
	(1)	(2)	(3)	(4)	(5)
Access to Network Radio	0.018***	0.019***	0.019***	0.017***	0.016***
	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)
× Either Foreign	0.025***	0.027***	0.027***	0.031***	0.031**
	(0.010)	(0.010)	(0.010)	(0.011)	(0.012)
× Both Foreign	0.014	0.015	0.023	0.006	0.013
	(0.015)	(0.016)	(0.016)	(0.018)	(0.020)
Sample restriction	None	Same SOB	No South	Firstborns	All
Controls	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	6,328,114	6,115,689	5,543,273	5,290,209	4,059,492
Adjusted R^2	0.025	0.025	0.025	0.025	0.027
Mean of Outcome	0.161	0.161	0.163	0.163	0.166

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Estimated effect of access to radio networks on the likelihood that a name is drawn from the top 10 of the white native birth cohort. Birth cohorts used to generate top 10 names are pooled from 1890 and 1900. All regressions include city and birth cohort fixed effects and a range of household controls. Main controls include home ownership, age of household head at child birth, occupational score of household head, household head employment status and household head nativity status. I cluster standard errors at the city level, i.e. at the treatment level. I construct my sample from the 1930 and 1940 full count census waves. To diminish attrition I retrieve the 1920s birth cohorts from the 1930 census and the 1930s birth cohorts from the 1940 census wave. The sample includes all children for whom I could geolocate the city of residence at census year.

Table 10: Results On Black Households Are Robust to Different Sample Restrictions

	1{Probability top 10 name from 1900s birth cohort}				
	Boys				
	(1)	(2)	(3)	(4)	(5)
Access to Network Radio	0.038***	0.032**	0.083**	0.046***	0.020
	(0.014)	(0.014)	(0.038)	(0.017)	(0.052)
Sample restriction	None	Same SOB	No South	Firstborns	All
Controls	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	654,307	594,541	292,347	472,671	175,248
Adjusted R^2	0.021	0.021	0.018	0.022	0.021
Mean of Outcome	0.252	0.250	0.260	0.260	0.267
	1{Probability top 10 name from 1900s birth cohort}				
	Girls				
	(1)	(2)	(3)	(4)	(5)
Access to Network Radio	0.029***	0.030***	0.042	0.038***	0.047
	(0.010)	(0.010)	(0.032)	(0.013)	(0.044)
Sample restriction	None	Same SOB	No South	Firstborns	All
Controls	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	653,048	590,667	285,205	471,449	169,797
Adjusted R^2	0.014	0.015	0.014	0.014	0.016
Mean of Outcome	0.142	0.141	0.145	0.146	0.147

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Estimated effect of access to radio networks on the likelihood that a name is drawn from the top 10 of the white native birth cohort. Birth cohorts used to generate top 10 names pooled from 1890 and 1900. Sample composed of black households only. All regressions include city and birth cohort fixed effects and a range of household controls. Main controls include home ownership, age of household head at child birth, occupational score of household head, household head employment status and household head nativity status. I cluster standard errors at the city level, i.e. the treatment level. I construct my sample from the 1930 and 1940 full count census waves. To diminish attrition I retrieve the 1920s birth cohorts from the 1930 census and the 1930s birth cohorts from the 1940 census wave. The sample includes all children for whom I could geolocate the city of residence at census year.

Table 11: Results On Black Households Robust to the Universe of U.S. Born Children

	1{Top 10 name from 1900s birth cohort}	
	Boys	Girls
	(1)	(2)
Access to Network Radio	0.012**	0.021***
	(0.005)	(0.004)
Controls	Yes	Yes
Location FE	Yes	Yes
Year FE	Yes	Yes
Observations	1,431,005	1,470,189
Adjusted R^2	0.020	0.013
Mean of Outcome	0.233	0.127

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Estimated effect of access to radio networks on the likelihood that a name chosen locally during the Golden Age of Radio is drawn from the top 10 names of the white native birth cohort. Birth cohorts used to generate top 10 names pooled from 1890 and 1900. Sample composed of black households only. This sample locates all children with non missing information on city/town of residence at the city/town of residence level. Rest of children are assumed to be located at the county centroid. All regressions include city and birth cohort fixed effects and a range of household controls. Main controls include home ownership, age of household head at child birth, occupational score of household head, household head employment status and household head nativity status. I cluster standard errors at the city level, i.e. the treatment level. I construct my sample from the 1930 and 1940 full count census waves. To diminish attrition I retrieve the 1920s birth cohorts from the 1930 census and the 1930s birth cohorts from the 1940 census wave.

A Appendix: Extra Tables and Figures

[Table 12 about here.]

[Figure 18 about here.]

[Figure 19 about here.]

[Figure 20 about here.]

[Table 13 about here.]

[Table 14 about here.]

[Table 15 about here.]

B Online Appendix: Radio Signal Computation

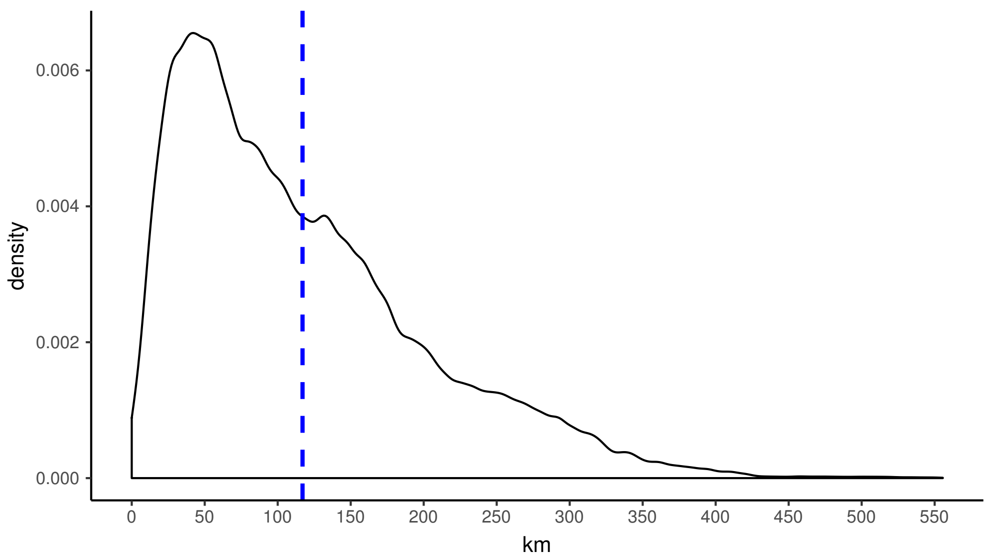


Figure B.1: Town Level Density of Radio Signal Connections by Distance to Stations; Vertical Line at Median Connection

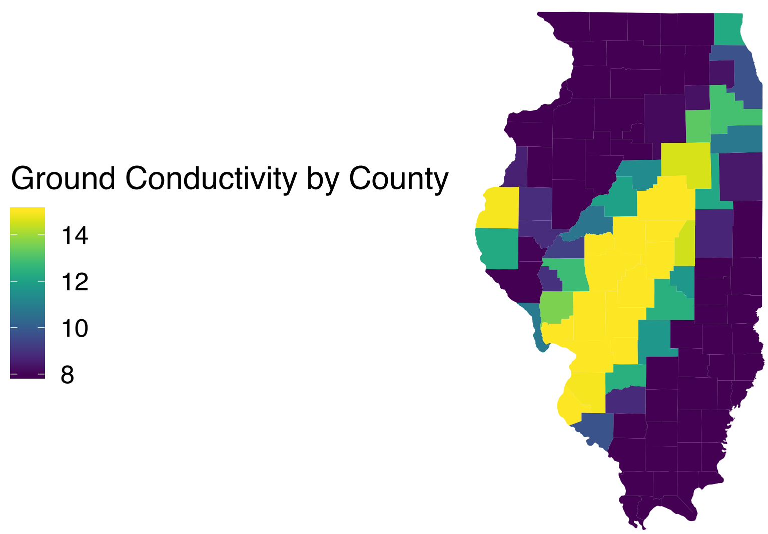


Figure B.2: Example of Ground Conductivity from Illinois. Ground conductivity is a fundamental driver of radio signal expansion.

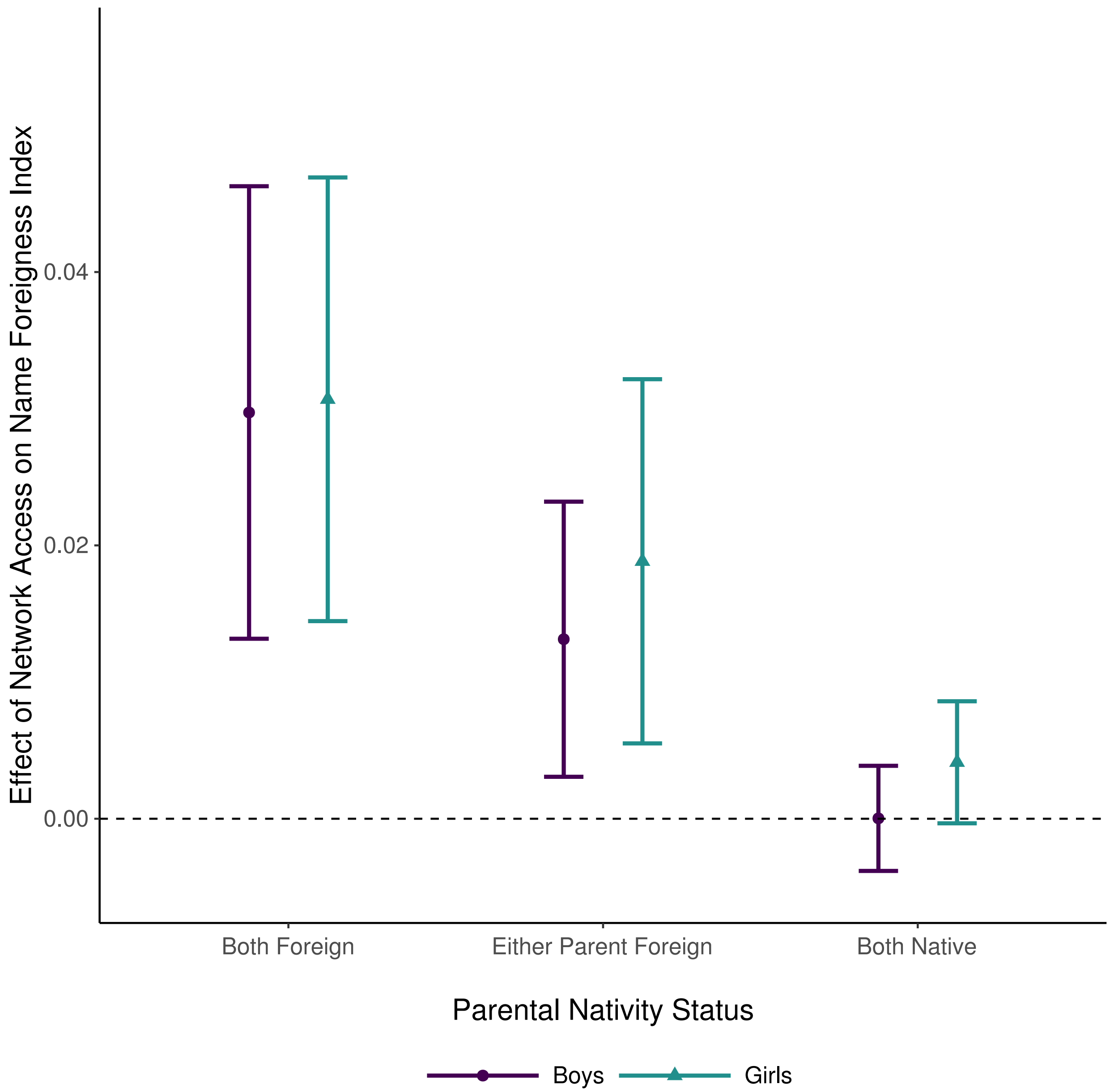


Figure B.3: Effects of Radio Network Access on Name Whiteness Index by Parental Nativity Status (Full count). Results suggest that network radio led immigrant households to assign names that were more likely to be associated with a white American born child rather than an immigrant child. Whiteness Index computed from 1920 birth cohort. This sample includes the universe of white children born in the U.S. between 1924 and 1940. Those I could not locate precisely to a city or town of residence I assign them to the county centroid. Following Abramitzky et al. (2018) coefficients come from a model with households fixed effects

Table B.1: Example of Homogenization Measured with Naming Patterns

	Names in Local Distribution		Names in Target Distribution	
	Name	Percentile in Cumulative	Name	Percentile in Cumulative
1.	James	50%	James	40%
2.	Gianluca	80%	Gianluca	75%
3.	Bob	100%	Bob	100%

Table B.2: Radio Networks Increased *Whiteness* Index of Names for Treated Black Children (Full count)

	Male		Female	
	(1)	(2)	(3)	(4)
Network Access	0.012***	0.005	0.017***	0.017*
	(0.004)	(0.009)	(0.005)	(0.009)
Network Access X White	0.003	−0.009	0.007	−0.015
	(0.004)	(0.009)	(0.005)	(0.010)
Controls	Yes	Yes	Yes	Yes
City FE	Yes	No	Yes	No
Household FE	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	11,498,844	12,455,653	10,918,571	11,829,915
Adjusted R^2	0.083	0.108	0.144	0.184
Mean of Outcome	0.398	0.398	0.324	0.325

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Estimated effect of Network Access on Names' Whiteness Index for Black Children. All specifications use full sample with interactions for race. This sample includes the universe of U.S. born children born between 1924 and 1940. If location of residence is not available I located them at the centroid of the county of residence. Blackness index based on children from 1920 birth cohort. Mean outcome reports the average blackness index for black children only. All regressions include birth cohort fixed, city or household fixed effects as reported in table and a range of household controls. Main controls include home ownership, age of household head at child birth, occupational score of household head, household head employment status and household head nativity status. I cluster standard errors at the city level, i.e. the treatment level. I construct my sample from the 1930 and 1940 full count census waves. To diminish attrition I retrieve the 1920s birth cohorts from the 1930 census and the 1930s birth cohorts from the 1940 census wave.

Table B.3: Names Given By Treated Households Are On Average More Popular in National Birth Cohort from 1900s

	Log Rank in White Native Distribution of Names					
	Male			Female		
	(1)	(2)	(3)	(4)	(5)	(6)
Network Access						
× Both Native	0.050***	0.070***	−0.025	0.030	−0.001	−0.307***
	(0.019)	(0.017)	(0.020)	(0.021)	(0.018)	(0.021)
× Either Foreign	−0.477***	−0.365***	−0.558***	−0.171**	−0.169***	−0.415***
	(0.090)	(0.075)	(0.089)	(0.074)	(0.064)	(0.071)
× Both Foreign	−0.621***	−0.428***	−0.817***	−0.317***	−0.137	−0.349***
	(0.118)	(0.100)	(0.113)	(0.118)	(0.103)	(0.108)
Trim bottom 10 pctile	No	Yes	Compliers	No	Yes	Compliers
Controls	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,249,387	6,534,177	7,205,181	6,641,657	5,974,293	6,601,167
Adjusted R^2	0.042	0.063	0.038	0.070	0.071	0.068
Mean of Outcome	3.791	3.369	3.766	4.988	4.550	4.963

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Estimated effect of access to radio networks on the rank of a name given to a white child during study period (1924–1940) has in white native birth cohort from the early 1900s. Most popular name have lowest integers. All regressions include city and birth cohort fixed effects and a range of household controls. Main controls include home ownership, age of household head at child birth, occupational score of household head, household head employment status and household head nativity status. I cluster standard errors at the city level, that is at the treatment level. I construct my sample from the 1930 and 1940 full count census waves. To diminish attrition I retrieve the 1920s birth cohorts from the 1930 census and the 1930s birth cohorts from the 1940 census wave. The sample includes all children for whom I could geolocate the city of residence at census year

Table B.4: The Homogenizing Effect of Radio on Percentile Rank Distance is Driven by Network Programs

	Male		Female	
	(1)	(2)	(3)	(4)
Access to Network Radio	0.049	0.029	-2.046^{***}	-2.023^{***}
	(0.176)	(0.175)	(0.212)	(0.210)
Access to Non-Network Radio		0.233		-0.311
		(0.210)		(0.234)
Controls	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	7,249,387	7,249,387	6,641,657	6,641,657
Adjusted R^2	0.114	0.114	0.112	0.112
Mean of Outcome	18.745	18.745	25.163	25.163

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Estimated effect of access to radio by network affiliation on distance between child name rank percentile at the local level and selected white native birth cohorts by gender. Percentile rank at local level constructed from county-level name distributions by gender and race. Sample includes only white children with non missing information on location of residence at census year. All regressions include city, birth cohort fixed effects and a range of household controls. Main controls include home ownership, age of household head at child birth, occupational score of household head and household head employment status. I cluster standard errors at the city level, i.e. the treatment level. I construct my sample from the 1930 and 1940 full count census waves. To diminish attrition I retrieve the 1920s birth cohorts from the 1930 census and the 1930s birth cohorts from the 1940 census wave.