Linguistic Barriers to State Capacity and Ideology: Evidence from the Cultural Revolution

PRELIMINARY AND INCOMPLETE

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Abstract

We study the role of media in the transmission of state ideology. In particular, we explore its perverse consequences in the context of the Chinese Cultural Revolution. During the 1950s, the Chinese government developed a wired broadcasting network to disseminate state rhetoric. To combat localism, media content was largely delivered in the national standardized language: Mandarin. This allows us to construct a measure of exposure based on the interaction of radio density and intelligibility of local dialects with Mandarin. We find that while the presence of radio increased revolutionary intensity locally, the effect was especially pronounced where Mandarin was more widely understood. On the individual level, we discover that native Mandarin speakers of the impressionable age group at the start of Cultural Revolution participated more in revolutionary activities, underscoring a mechanism through which propaganda operated. Our results highlight linguistics as a constraint on state capacity and illustrate a persistent tension faced by the state between policy standardization and efficiency.

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1 Introduction

State capacity, broadly conceived, is increasingly invoked as a necessary precursor for economic development. But where does this capacity originate? More specifically, what determines a state's ability to adopt policy positions it attends to achieve, especially when the policies themselves may be radical in nature and their enforcement rife with coordination challenges? In this paper, we study the role of media as a determinant of "infrastructural power" and its perverse implications in the setting of the Chinese Cultural Revolution.

The Cultural Revolution (1966-1976) was a large-scale political movement with the expressed purpose of eradicating bourgeois elements and forestalling a capitalist restoration. It encompassed a campaign of violence against the educated elite and the former landowning class. The implementation of the Cultural Revolution hinged on popular participation among ordinary citizens who willingly perpetrated violence on behalf of the state with limited personal incentives.

Despite a large literature documenting the consequences of this traumatic episode on Chinese history and the cohorts which experienced it, there is little consensus on what accounted for the overwhelming civilian response and cooperation. This question features centrally in our empirical inquiry.

We argue that state sponsored media played a role in the local intensity of the Cultural Revolution. We provide empirical evidence that Communist state leveraged radio propaganda as a nation-building strategy to ensure mass mobilization and compliance during the Cultural Revolution. In doing so, we explore the linguistic constraints to the transmission of ideology and indoctrination.

Our first contribution is developing a way to measure exposure to radio broadcasting at a fine geographic level. From the 1950s onward, the Communist Party developed a wired broadcasting network to disseminate politicized state rhetoric. The Communist Party invested heavily in radio infrastructure, creating a way in which it could quickly and easily reach all its constituents, even peasants living in the remote countryside. These broadcasts became a ubiquitous and an unavoidable feature of daily life.

While the presence of the propaganda was pervasive, the comprehension and reception of the message was not uniform. In 1956, the party initiated a process of language standardization. As an attempt to combat localism and foster integration, there were severe restrictions on the use of minority dialects on the airwaves and it was mandated that all central broadcasts from Beijing would be conducted in the official party language: Standard Mandarin. As a result, the propaganda effort became muted in areas whose people did not comprehend Standard Mandarin.

We exploit this institutional detail to create a novel measure of the intensity of treatment. Leveraging prior work in experimental linguistics and linguistic genealogy, we quantify a local dialect's

intelligibility with Standard Mandarin. This measure of linguistic distance in conjunction with the provincial radio density allows us to construct a proxy for the intensity of propaganda that reflects both the passive access to radio broadcasts as well as the active salience of the broadcasts. This enables us to determine the contemporaneous effect of media on the extent of collective killings attributed to the Cultural Revolution at the county level.

Ultimately we examine the relationship between this interaction term and casualties attributed to the Cultural Revolution spatially. We establish that counties which had *both* a higher level of comprehension of Mandarin and more robust radio infrastructure experienced more revolutionary activities; and *only* in counties where Mandarin was readily understood, was radio particularly effective in mobilizing mass participation.

The success of indoctrination hinged not only on the availability of broadcast infrastructure but also on the linguistic compatibility of the listening public. Thus, the policy to use Mandarin on the airwaves was at odds with the simultaneous goal of spreading ideology among a linguistically heterogeneous state. Our result highlights a persistent tension faced by the state, between effective administration and centralization of policy.

China is a well suited quasi-experimental setting in which to study the linguistic constraints on state capacity. China is composed of hundreds of mutually unintelligible dialects, with the degree of intelligibility sometimes decreasing gradually with distance, sometimes sharply. Unlike other modern nation states with the same level of linguistic diversity, most of China's linguistic variation does not stem from ethnic differences. Whereas other linguistically fragmented states such as former Yugoslavia are recent inventions of international diplomacy, China is an organically consolidated nation state with a long history of unified identity. Linguistic differences in China reflect historical migration patterns and language diffusion of cultural groups that were no longer salient by the eve of the event studied. There is no sense that an individual from Shanghai or Guangzhou who does not speak Mandarin is any less Chinese than an individual from Beijing who does. The unique intersection of linguistic heterogeneity and ethnic homogeneity lends itself to plausibly exogenous variation for causal identification.

In addition to examining the contemporaneous effects of propaganda, we also investigate its persistent effects to further explore potential ideological mechanisms which incited individuals to action during the Cultural Revolution. We draw our evidence from the China Family Panel Studies (CFPS) survey. We investigate if the effect of propaganda is especially persistent for those belonging to certain impressionable age groups, particularly youth, at the start of the Cultural Revolution. We find that individuals between the age of 12 and 21 at the start of the Cultural Revolution who understood Mandarin are more likely to join the Communist Party later in life, as well as participate in the send down movement. This result coincides with both the psychological and historical literature regarding the susceptibility of adolescents to media indoctrination and the age of the Red

Guard participants during the Cultural Revolution.

This paper contributes to the literature on state capacity and linguistic diversity. Fractionalization is a barrier to state capacity, hindering the government's ability to rule over its people. Outcomes due to this limitation on state capacity are found to have an unfavorable impact on the country. Numerous studies have attributed this diversity to political instability, poor political and economic institutions and low economic growth. Easterly and Levine (1997) find that GDP growth is inversely related to fractionalization across a large sample of countries. La Porta et al. (1999) find that ethnolinguistic fractionalization is important in determining the quality of government. We provide a clear mechanism of the limits to centralization when there is fractionalization. During the Cultural Revolution in China, linguistic fractionalization prevented the state from carrying out its goals by constraining the audience of state sponsored media, limiting the scope of persuasion. This provides evidence that linguistic standardization augments state capacity and linguistic differences constrain the transmission of state ideology.

Our work also complements recent work exploring the effect of state propaganda on violence. Voigtländer and Voth (2014) find that highway building during the Nazi regime was a form of propaganda which garnered support for the Nazi party. Media in the form of radio specifically has also been the subject of recent literature. Yanagizawa-Drott (2014) finds that radio broadcasts encouraging violence during the Rwandan genocide increased militia violence. Adena et al. (2014) attributes the rise of Nazi support partially to the influence of radio propaganda. Our paper explores the effect of propaganda in novel setting – the Cultural Revolution, in addition to exploring a broader set of outcomes and long term consequences of propaganda (Alesina and Fuchs-Schündeln (2007a)).

Many papers have also explored the long run outcomes of living through the Cultural Revolution, both on an individual level and geographic level. Meng and Gregory (2007) find that those whose education was disrupted during this time period faced a decrease in lifetime earnings. Zhou (2013) explores the long term effects of the send down movement on individuals, finding that those who were sent down in fact have better economic outcomes. Gong et al. (2015) explores the persistent effect of China's "send-down" movement during the Cultural Revolution, finding that those individuals who were sent down to work in the countryside are less likely to believe that external circumstances such as luck, control their lives. Gong et al. (2014) also find that these sent-down youth are more likely to experience mental health problems and chronic diseases. Bai (2014) investigates the economic legacies of violence during the Cultural Revolution, finding that more revolutionary regions were slower to industrialize and have a lower GDP. To our knowledge, we are the first to explore the causes of violence.

The rest of the paper proceeds as follows: Section 2 provides a brief history of the Cultural Revolution, and Section 3 describes our data. Then Section 4 describes the main empirical strategy and

results, and Section 5 discusses a potential mechanism. Concluding remarks are offered in Section 6.

2 Background

The Cultural Revolution began with the ostensible purpose of consolidating the progress made in the Communist Revolution and to preclude the re-emergence of inequitable and capitalist tendencies. In reality, Cultural Revolution was borne out of factional in fighting between Mao and other senior party leaders within the Chinese Communist Party (CCP) leadership. Following the failure of the Great Leap Forward, Mao found himself increasingly marginalized and isolated from the political process in the central committee. In his absence, party leadership endorsed more conservative policies which partially restored limited free market practices. As a result, in 1966 Mao launched the Great Proletarian Cultural Revolution with an intent to regain effective decision making and "cleansing the class ranks" of "bourgeois elements".

The first two years of the Cultural Revolution, from 1966 to 1968, were characterized by violence and breakdown in social order. However, this violence did not originate directly from agents of the central government. The Cultural Revolution did not involve shootings from the state. Rather most of the violence was individual on individual violence from group monitoring. Individuals deemed incompatible with the socialist system were persecuted, including intellectuals, senior party officials, rich peasants, teachers and elites. These "class enemies" were subject to public denunciations, forced self criticisms, and beatings if not outright death. School and universities were shut down so that youths could devote their time to revolutionary activity. Mao mobilized the Red Guard, a revolutionary youth organization which targeted the easily molded minds of the youth. The Red Guards terrorized class enemies, which included teachers and even own family members. Since there were no official rules about how to identify anti-Revolutionaries, even ordinary citizens began to incite violence as a way to prove loyalty to the revolutionary cause.

State apparatuses such as the police and the military were largely paralyzed. Legitimacy during the Cultural Revolution grew from association with Mao and active suppression of revolutionaries was politically problematic. Hitherto, Red Guards acted with impunity and chaos ensued. In addition to attacking people, historical culture and art were also attacked. The "Destroy the Four Olds" movement encouraged the destruction of old customs, habits, culture, and ideas. This led to the ransacking and desecration of cultural relics, temples, literature, artwork, and religious items reminiscent of "old culture" (Spence (1991), MacFarquhar and Schoenhals (2009)). According to varying sources, between 200,000 and 8 million were killed, and many more were victims of persecution (Walder and Su (2003)).

In mid 1968, with the violence escalating, Mao ordered the Red Guard movement to be disbanded.

He feared that further disorder might prove to be detrimental, if those inciting violence became uncontrollable. In response to the revolution's excesses, Mao began the "Up to the Mountains, Down to the Countryside" Movement, also known as the *sent down movement*, during which 17 million youth from the cities were sent to the countryside to learn from farmers and villagers. Although rural rustication was framed as a necessary reeducation, it served a dual purpose to defuse violence and lower unemployment in the cities. With schools shut down, youth had nowhere to go. Mao depicted this movement as a patriotic event, so former Red Guards and youth volunteered to be rusticated. Red Guards were disproportionately likely to have been sent down either out of their own volition or ideological manipulation, although many were also forcibly sent down to the countryside as part of compulsory policy.

The Cultural Revolution required participation at many levels of the public. As a young and relatively poor government, it was infeasible to carry out policies through centralized state agents operating from Beijing. Instead, the Communist Party relied on a grass roots mobilization agenda, in which group monitoring precluded the need for centralized policing. In order to mobilize the public, the government needed to find a way to sway the psyches of the people and convince them to ascribe to Communist ideology. Local bureaucrats far away from Beijing, who were historically loyal to their people, had to be persuaded to listen to the messages from the central government. In turn, these bureaucrats would spread the message of the state, encouraging the people of their own locality to participate in the country's cause as well. Thus, those who ended up participating in the Cultural Revolution were not agents of the central government, but instead, the common people. It was these ordinary citizens who monitored each other to make sure that the goals of the central state were carried out.

2.1 Propaganda and Popular Participation

Crucial to the implementation of the Cultural Revolution was collective participation among cadres and individuals whose connection to political life was tangential at best. The key question centers around how state sponsorship induced ordinary citizens to become institutional agents.

In initiating the Cultural Revolution, Mao bypassed traditional party infrastructure and reached out directly to millions of youths who readily responded. Beginning in Beijing, grassroots Red Guard organizations formed within the first months of the Cultural Revolution and at its peak, there were an estimated 11 million Red Guards across the country. The overwhelming mass response became the instrument of Mao's de facto power and featured integrally in his ability to remove his opponents.

Both scholars writing contemporaneously during the midst of the Cultural Revolution and researchers writing retrospectively have noted the pervasiveness of politicized rhetoric during this

time period and have contemplated its role in facilitating the events (Jan (1967), Howse (1960), Markham and Liu (1969)). The Communist party itself was keenly aware of media as source of indoctrination and social control. The amazing alacrity with which Chinese government developed its network of state sponsored media following its establishment in 1949 was described by Western sources as the "most extensive propaganda effort" in history (Howse (1960)).

While premeditating the Cultural Revolution, Mao deliberately took control of propaganda during the Socialist Education Movement of 1962-1965. During this time period, political propaganda actively promoted the demagoguery of Mao and emphasized *Maoist* thought over any semblance of orthodox Marxism. The worship of Mao intensified to a unprecedented level and this cult of personality laid the foundation for the subsequent mass mobilization. Mao's collected quotes were published "Quotations from Chairman Mao Zedong", which became one of the most printed books in history, with more than 1 billion copies in circulation between 1964 to 1976.

Mao's direct channel of communication with the people enabled him to subvert party leadership when his power within the party diminished. Instead of instructing the people to follow authority, Mao now sanctioned attacks on figures of authority and those with whom he disagreed with in the Communist Party. The masses had already been indoctrinated to recognize the authority of Mao over the party, so he was easily able to persuade the people to follow his word to turn against authority.

Propaganda was delivered through a variety of mediums: books, posters, newspapers, magazines, and radio. Because of the largely rural and illiterate populace, radio became a particularly effective channel of persuasion and state communication.

2.2 Radio Content and Scope

Radio broadcasts were a unavoidable part of everyday life in China from the mid 1950s onward. Because personal receiver sets were costly to manufacture and private ownership were scarce, radio broadcasts were typically transmitted through wired loudspeakers. Wired loudspeakers were cheaper to build en mass, and also allowed the Communist government complete control over listening content.

Most villages were equipped with central listening stations, typically in public spaces such as town squares or production center, where people gathered to listen to radio broadcasts (see Figure 9). Listening was largely compulsory as the loudspeakers broadcasted for set hours each day.

Propaganda constituted a significant portion of the content over the airwaves. On average, radio broadcasts on the eve of the Cultural Revolution would last 435 minutes per day, consisting of program announcements (5%), educational programs (16%), newscasts (29%), weather (20%), agricultural programs (7%), and entertainment (41%). In addition to newscasts, even educational

and agricultural programs would include propaganda. Newscasts would consist of broadcasts from the Central People's Broadcasting Station, the official party station, including programs such as "Quotations from Chairman Mao," "Selected Reading of Chairman Mao's Works," and leaders' speeches (Jan (1967)). Entertainment included revolutionary songs and dances. All Western influences, including music, were purged, leaving only party propaganda. Agricultural programming consisted of half technical advice and half propaganda, which included speeches of model farmers. Propaganda and indoctrination totaled 85% of broadcast time. These radio broadcasts encouraged listeners to participate in the revolutionary cause to build a greater China together.

Plans to extend the radio broadcast system were implemented beginning in the 1950s. The Communist Party built up extensive radio infrastructure across the country, and by the start of the Cultural Revolution, radio broadcasting had reached over 95% of counties, with 11.5 million radio receiving sets across the country, amounting to 1.6 radios per 100 people (Latham (2007)) and at least 6 million loudspeakers. The number of loudspeakers increased dramatically to more than 100 million by the 1970s. The integration of radio programs with political agenda forced the people to focus on the goals of the nation. Political indoctrination created a mass political awakening and nationalized public attention. The unified content of the coercive listening system fostered a sense of unity that was especially apparent and effective among poorly educated peasants in rural areas and among the youth. The radio network across China thus helped to shape the image of national authority (Liu (1971a)).

The ubiquity of radio infrastructure and unavoidable nature of radio broadcasts allowed the Communist Party to regularly communicate with the masses. However, even though nearly everyone was exposed to this propaganda, comprehension varied across the country. In an attempt to combat localism and to facilitate integration, it was mandated that all official party propaganda transmitted through the wired rural broadcast network be conducted in Standard Mandarin. As a result, in provincial counties where the native dialect was not Mandarin only an estimated 15% of audience members could actually comprehend the centrally relayed broadcasts from Beijing (Liu (1971a)). Zhou Enlai himself remarked in 1958:

> Radio and the cinema are powerful publicity instruments. But as our common speech has not yet been made universal, their effectiveness in the districts where only local dialects are spoken is inevitably limited. (Liu (1971a))

We exploit this important historical detail in our paper.

2.3 Language Standardization and Policy

China is a linguistically diverse nation, within which the predominant language is Chinese, or *Hanyu*.[1] Chinese itself refers to a collection of related but often mutually unintelligible dialects. The varieties of Chinese resemble distinct spoken languages united by a single written script and shared cognates.[2] The varieties of Chinese differ mainly in their phonology and to a lesser degree, syntax and vocabulary. Linguists have categorized the varieties in several different ways, but most agree that there are between seven and ten groups, only one of which is the Mandarin family.[3] There is a general consensus of a North and South division with more pronounced variation in the rugged South.[4]

Before the ascendance of the Communist party in 1949, there was no national standard language. A common governmental language existed in the form of *Guanhua* during the dynastic periods but it was used only by upper echelons of bureaucrats and magistrates (Ramsey (1987)). In the incipient years of Communist rule, the regime was quite tolerant of minority dialects as the Communist revolution had drawn its support from the largely dialect-speaking rural peasant population. But by 1955, the government had become highly cognizant of linguistic barriers to national construction and in a little publicized Conference on Standardization of Chinese Language in 1956, a simplified version of Standard Mandarin was devised and promoted as the common tongue.

This language policy was implemented into language practices through different mechanisms including laws, regulations, language education policies, language exams, and restriction of minority language use in public spaces (Barnes (1982)). In 1956, primary school teachers were trained in the standard language and use of minority dialects in schools or over the airwaves was rebuked. Even the primacy of propaganda had to be subjugated under the directory of language standardization. Thus the use of Mandarin in propaganda in counties where it was not understood should not be considered an oblivious oversight by a non optimizing bureaucrat. Rather, it was a calculated choice under constraints and a careful trade off between the static efficiency of persuasion and dynamic efficiency of linguistic standardization.

[1] There are also at least nine groups of non Chinese languages spoken by ethnic minorities within the present PRC borders. These are excluded from consideration.

[2] To fix ideas, a helpful analogy can be drawn to variations within the Western Romance languages. But unlike the Romance languages, the differences in Chinese dialects reflect only the spoken form. There is only one written form of Chinese, which would be used for anyone writing or reading Chinese. Henceforth we will refer to the varieties of Chinese as dialects for simplicity.

[3] The common agreed upon groups include: Mandarin, Hakka, Cantonese, Wu, Gan, Min, and Hui. This level of categorization subsumes a great deal of underlying differences as there is local variation even within these broad groups.

[4] Northern China is composed of flat central plains whereas the South is riddled with mountains and rivers.

3 Data, Variable Definitions and Summary Statistics

3.1 Intensity of Cultural Revolution

The main outcome of interest is the intensity of the Cultural Revolution. On the county level, the proxy for intensity is the number of killings due to Cultural Revolution violence. The data was collected by Walder and Su (2003) from county annals published in the late 1980s, and the violence data was digitized by Bai (2014). The geographic distribution of county level deaths from this data is shown in Figure 4b. China's tradition of compiling gazetteers dates back to the Qin dynasty, when they consisted of basic maps. These gazetteers were mostly compiled from local instead of national directives. Over time, the annals became more detailed and contained information about a county's boundaries, population, geographic features, customs, and ethnographic information.

The annals from where our data comes from included narratives and personal anecdotes of the violence that occurred during the Cultural Revolution compiled from local archives and official investigations in the 1970s and 1980s. Because of the details of the Cultural Revolution, compilers faced a dilemma of how to precisely record this history. In 1985, national standards were established, to record the history of the Cultural Revolution in "broad strokes, not in detail." Each county was at liberty to interpret this phrase however it wanted to. Some of the annals were very lengthy and detailed, including details on the method of killing, while others were brief and conservative. Although these annals contained varying degrees of details, they all included specifics on the number of deaths. The reason for this investigation into the number of deaths due to the Cultural Revolution came from a directive to compensate wrongfully persecuted victims and their families as well as to punish perpetrators Su (2011). The data that Walder and Su (2003) compile come specifically from violence that occurred between June 1966 and December 1971.

Walder and Su (2003) estimate between 750,000 to 1.5 million killed due to violence from the Cultural Revolution, after accounting for under reporting. In addition to the violence dataset, we also use several rounds of country-wide census data from 1964, 1982, and 2000. This data comes from the University of Michigan's China Data Center. Table 8 shows the county level histogram of percentage killed by county, and Figures 4 show the geographic distribution of deaths, by count and percent of county population, respectively.

3.2 Radio Network Data

Important to our analysis is the geographic distribution of the rural broadcasting network which transmitted content from the broadcasting nuclei to its periphery. Radio programs were broadcast via loudspeakers to the listening public, but we do not have precise information on either the

placement or number of the installed loudspeakers. Instead, we construct a proxy for the variation in radio coverage based on the locations of radio stations.

Radio signals from the central government in Beijing were not relayed directly to loudspeaker systems in each county; instead, they had to be relayed to provincial or provincial radio stations first, before being transmitted to local radio speakers, and then to loudspeakers. Wired radio speakers were gathered into nets, called radio diffusion exchanges. Each exchange received programs from both central and provincial radio stations through aerial receivers or through telephone lines, which it then distributed over a system of wires to loudspeakers in public places: factory shops, dormitories, and other areas were large groups of people could hear the broadcasts. This wired system enabled complete control over listening content, with all loudspeakers within the same net receiving the same message (Houn (1957)).[5]

Because of the engineering requisite to these radio diffusion exchanges, the density of radio stations had a first order effect on local loudspeaker coverage. The growth in local loudspeaker networks was in proportion to the development of the central radio broadcasting stations Liu (1971b). Using historical archival data on the locations of radio stations, we compute the number of radio stations in each province as a measure of local loudspeaker density. Figure 5 shows the geographic distribution of these radio stations across China in 1962 on the eve of the Cultural Revolution.

While the Communist government pursued an ambitious plan to expand radio infrastructure nationwide, the reality of development was uneven. There is surprising amount of variation in the aggregate number of radio stations provincially, even after normalizing for province size. The number ranges from one to ten stations per province. The differential scope in radio infrastructure can be largely attributed to the main constraint to its construction: electricity.

Sustained radio operation required a consistent source of electrical power. By the mid 1960s, widespread electrification still eluded significant portions of China. Large power plants were concentrated only in coastal locations and former Japanese occupied regions of Manchuria. This was despite the call for installation of large hydro and thermal plants in Beijing's first Five Year Plan, initiated in 1956. The actuality electrification campaign consisted of crude generating plants of every conceivable method; for example, small hydro motors, hand generators, gas motors, and wind motors.

As a result, radio development was confined to areas areas where the power supply was relatively sufficient. This pattern of radio stations is confirmed in the data as radio station presence is most prevalent along the two main railroad routes at the time: from Beijing to Hangzhou, and from Guandong to Hangzhou, as well as near tributaries of major waterways. In some parts of the country radio infrastructure was bootstrapped from older telephone lines.

[5]This system of radio diffusion exchanges was modeled after a very similar system in Soviet Union.

As should be expected, the distribution of radio station was not random. However a central determinant, electricity, reflects technological limitations rather than considerations immediately pertinent to the political climate. Thus, the distribution of radio stations is orthogonal to the incidences of the Culture Revolution.

3.3 Linguistic Data

Our identifying variation is generated by differences in regional vernacular dialects and heterogeneity in their compatibility with Mandarin. We assemble this data in two steps. First, we identify the spatial variation in dialects across China from *The Language Atlas of China*. The Language Atlas is a compilation of local linguistic studies documenting Chinese dialects and their genealogical relationships. The digitized data is organized at the county level. It records the primary dialect spoken in each county, other minor dialects present if available, and the dialect families they belong to. We restrict our attention to linguistic diversity within ethnically Han population and exclude observations, primarily in autonomous regions, where non Chinese languages, such as Turkic, Altaic, or Mongolian languages are observed. This mitigates possible confounding bias of ethnicity.

Second, to assess the strength of each dialect's linguistic distance to Mandarin, we appeal to experimental data collected by linguists in the field. Tang and Van Heuven (2009) studies the strength of pairwise mutual intelligibility between Chinese dialects. They relate functional intelligibility between dialects to proximity in lexical structural and phonological regularity.

The authors conducted an extensive experiment in order to find the mutual intelligibility between pairs of Chinese dialects. 150 native speakers of each of 15 different Chinese dialects were subjected to a listening exam where they were asked to identify words and sentences read by speakers of another dialect, including their own. The listening exam was administered via a recording of 288 standard Chinese core words read by a native speaker of each dialect. The participants resided in rural areas and were around the age of 50 in 2009, and thus, were youths at the time of the Cultural Revolution.[6] From this experiment a measure of bilateral intelligibility between dialects was compiled. The findings are shown in Figure 7. From this chart, we focus on the row "Beijing," which represents the ability of listeners of each dialect to correctly identify words from the Mandarin dialect. Since only 15 dialects were studied instead of the entirety of Chinese dialects, we use each of these dialects to be the representative of the family of dialects that they originate from.

We construct our analytical dataset by combining the geographical data on variation in the dialects spoken by county and the proximity of each of these dialects to Mandarin.

[6]Therefore, their intelligibility scores would closely reflect intelligibility of youths during the time period we are interested in.

3.4 Individual-level Data

Individual-level microdata comes from the China Family Panel Studies (CFPS), a cross sectional and contemporary survey. The CFPS is a longitudinal survey conducted by the Institute of Social Science Survey of Peking University in China, consisting of data relating to respondents' educational outcomes, family dynamics, migration and health. Demographic information include date of birth, province of birth, province of residence at various points throughout one's childhood, send down movement experience, gender, ethnicity, parents' occupation, hukou status and language spoken at home. The CFPS dataset consists of 33,000 individual observations.

The specific individual level outcomes that we study in our paper are revolutionary activity, and to measure this, we examine the responses to the following questions:

- "Are you a member of the Communist Party of China?" We refer to joining the Communist party within 45 years of birth as *communist*
- "Have you had any of the following life experiences?" Choices include the "Send-Down" experience, referred to as *sent-down*.

In addition to these outcome variables, we also proxy for comprehension of Mandarin during the respondent's youth with a dummy variable indicating if the primary language used in daily communication with the respondent's family is Mandarin Chinese, as opposed to a Chinese local dialect or Minority ethnic dialect. This variable is referred to as *mandarin*. Summary statistics are shown in Table 1.

4 Empirical Strategy & Results

In this section, we study the degree to which radio propaganda mediated the intensity of the Cultural Revolution. To preview our results, we find that only counties with both a higher concentration of radio infrastructure and whose main dialect is highly intelligible with Mandarin experienced a greater degree of violence during the Cultural Revolution. Neither speaking Mandarin nor having a high radio network concentration alone are able to explain Cultural Revolution intensity; rather, it is the interaction of comprehension and availability of the messages that result in a higher observed number of killings per county during this time period.

We begin by documenting patterns of descriptive associations central to our research design. We relate the strength of the radio network provincially and the intelligibility of a county's main dialect with Mandarin to the local intensity of the Cultural Revolution in two separate regressions. Specifically the two estimating equations are:

$$CR_{c,p} = \alpha_r radio\ density_p + \boldsymbol{\gamma}\mathbf{X_{c,p}} + u_c \tag{1}$$

$$CR_{c,p} = \alpha_l Mandarin_c + \boldsymbol{\gamma}\mathbf{X_{c,p}} + \delta_p + u_c \tag{2}$$

We regress the number of casualties attributed to Cultural Revolution violence in county c of province p, $CR_{c,p}$, first on the number of radio stations in province p, and second on an indicator variable for whether the local dialect in county c is Mandarin. $\mathbf{X_{c,p}}$ is a control vector that contains a large set of contemporary and historical characteristics.

In the second specification, using a dummy for speaking Mandarin as the independent variable, we include a province fixed effect, δ_p, to capture residual unobserved variation across provinces. Columns 1 and 2 of Table 4 report the regression results. Counties located in provinces with a higher concentration of radio stations experienced a greater level of violence after controlling for observables. In addition, Mandarin speaking areas had significantly more deaths than their non Mandarin counterparts within the same province. The effect is sizable and corresponds to a near 25% increase in overall death toll if the entire country was Mandarin-speaking. Overall the findings confirm that the degree of violence varied systematically with the density of radio stations and the local dialect spoken.

4.1 Baseline Specification

To delve further into detail, we turn to our main empirical analysis. Our empirical strategy is motivated by the institutional features of the historical episode, where both the penetration of the broadcast network and the local people's ability to comprehend Mandarin influenced the strength of exposure. Thus, we investigate the interaction between radio coverage and linguistic comprehension. Equation 3 describes the baseline specification:

$$CR_{c,p} = \alpha_r radio\ density_p + \alpha_l Mandarin_c + \beta Mandarin_c * radio\ density_p + \boldsymbol{\gamma}\mathbf{X_{c,p}} + u_c \tag{3}$$

where all variables are defined as above and the coefficient of interest is β. Our baseline control, $\mathbf{X_{c,p}}$, includes following variables at the county level: railroad access, ruggedness of the terrain, river and coastal access, area, treaty port status, distance to major cities, distance to Beijing, historical Buddhist temples,1964 population, 1964 gender ratio, 1964 fraction of non agricultural population, number of households, and ethnolinguistic fragmentation.

Our econometric framework relies on the interaction between the two sources of variation, *radio density* and $Mandarin$, and only the interaction is to be interpreted as plausibly exogenous. The key identifying assumption is that the interaction term between $Mandarin_c$ and $radio\ density_p$ is orthogonal to other determinants of violence. We address the concern of the potentially endogenous selection of radio station locations with our specification.

The coefficient β reflects the relative difference in the degree of violence between Mandarin and non Mandarin speaking counties in provinces of high radio coverage versus low radio coverage. Our strategy is similar in spirit to a traditional differences in differences framework, only exploiting comparisons across space rather than time. Analogously, identification requires that the unobserved differences between Mandarin and non Mandarin counties in high radio density provinces to be comparable to the unobserved differences between Mandarin and non Mandarin counties in low radio density provinces in a counterfactual world in the absence of radio stations. This assumption would be violated if radio stations were installed more heavily in places where the Mandarin speaking counties were expected to be more violent. We argue this is implausible, given that this would be a peculiar criteria for selection of radio station placement on the part of Communist regime, and because radio station construction were largely governed by technological constraints.

Nevertheless, we make progress towards addressing selection and examining the validity of our research design by controlling for potential omitted variables explicitly in our main specifications as well as by performing extensive robustness checks where we include full interactions of the $Mandarin_c$ dummy with reasonable control variables in the robustness section. Drawing on the growing and emerging literature on determinants of violence, we add controls to dissuade potential competing stories. Specifically, we add 1968-1969 monthly precipitation given the various findings documenting the relationship between climate and violence (Miguel et al. (2004)), geographic controls based on agricultural suitability and ruggedness of terrain to account for the links between geography and institutions (Nunn and Puga (2012), Jia (2014)), historical development to accommodate for unobserved difference in economic opportunities across locations, and historical conflict to address potential persistence in violent behavior (Bai and Jia (2016), Dube and Vargas (2013)).

The estimates from our main estimation equation are presented in the last three columns of Table 4. The raw relationship without additional controls is reported in column (3). Whereas the coefficients on just *radio density* and $Mandarin_c$ are negative or small, we detect a meaningful and significant positive coefficient of 0.011 on the interaction term.

In column (4) we introduce control variables that capture cross county differences in railroad access, ruggedness, river and coastal access, area, treaty port status, distance to major cities, distance to Beijing, historical Buddhist temples,1964 population, 1964 gender ratio, 1964 fraction of non agricultural population, number of households, and ethnolinguistic fragmentation. This is our preferred specification.

Adding the baseline controls improves the explanatory power of the econometric model and the significance of the estimated effect. In counties that speak Mandarin, an extra radio per province leads to about a 0.015 percentage point increase in the number killed per county, relative to non Mandarin speaking areas in the same province. This is a meaningful effect, as the average percent killed per county is 0.042 percent.

The response to propaganda is driven by the interaction between ubiquity of propaganda along with ability to comprehend the propaganda. With the inclusion of the interaction term, the coefficient on *Radio Network* alone becomes economically small and statistically insignificant, and the coefficient on *Mandarin* alone is negative, as compared to columns (1) and (2). This is evidence that the unique intersection between comprehension of radio broadcasts as well as access to radio broadcasts was a mechanism in driving Cultural Revolution violence. Access without comprehension, or vice versa, was not sufficient.

In the last specification, column (5), we include provincial level controls for the intensity of the Great Leap Forward as proxied by dining hall participation, steel production, and collectivization. This ensures our estimate is not confounded by latent differences in party infrastructure or membership. The estimated effect is largely comparable.

4.2 Alternative Specifications

One might think that results are driven by Mandarin speakers being somehow different – that they more educated, or more "Communist" than Non-Mandarin speakers. However, in the early days of the Cultural Revolution and during the rise of the Communist Party, language standardization had nothing to do with Communism. The National Language Unification Commission established the Beijing dialect of Mandarin as the standard language of the country in 1932, and the People's Republic retained this standard when they took power in 1949. In addition, in the early days of the Republic, there was no sense in which Mandarin speakers were more educated (although this may be the case today, as Mandarin is the official language taught in schools). Since language standardization was still beginning to take effect at the start of the Cultural Revolution, language comprehension was a matter of location, not of education.

In a similar vein, one might question whether Mandarin speakers and non Mandarin speakers have a different sense of identity. If this were true, Mandarin speakers might have more motivation to act upon messages they hear from radio broadcasts, while non Mandarin speakers may ignore these messages, even if they do understand them. However, we emphasize that the linguistic divisions we explore are variations within the Han Chinese ethnicity. There is no "Mandarin" ethnicity. Thus, theories from literature on identity and conflict do not apply in this context. The Han Chinese do not see Non-Mandarin as the language of outsiders, but rather, just as dialects of China. A balance

test between Mandarin speaking and non-Mandarin speaking counties is shown in Table 3.

To further dissuade concerns that our results are driven by fundamental differences between Mandarin and Non Mandarin locations, we also use a more continuous measure of language, *experimental intelligibility*. The *experimental intelligibility* measure is created from data collected in Tang and Van Heuven (2009). Since they only focus on 15 dialects, we use each dialect they study as the representative dialect for that group or supergroup of languages, depending on the granularity of the dialects in the Tang and Van Heuven (2009) study. This measure is constructed using the percentage of the 266 core Mandarin words understood by the sample of 150 speakers of each representative dialect. We standardize these comprehension measures by subtracting the percent understood by native speakers of each dialect.

Because there exist differences in mutual intelligibility with Standard Mandarin between dialects within the Mandarin supergroup as well as variation across other language groups, this continuous measure utilizes more variation that is arguably more exogenous. The main regression we run is the same as Equations 2 and 3, but instead using the *experimental intelligibility* specification for *language*.

In Table 5, we present the analogous results from Table 4, but using the *experimental intelligibility* as a measure of *language*. In the first column, we find that a higher intelligibility with Mandarin leads to a higher percent killed due to Cultural Revolution violence in that county. This is suggestive evidence that radio propaganda contributed to a greater intensity of the Cultural Revolution in counties which spoke Mandarin, through the channel of language comprehension. In the second column, we present results from Equation 3, and find that a higher percent intelligibility of Mandarin interacted with number of radio networks per province also leads to a higher percent dead in a county. In the last column, we restrict the analysis to non-Mandarin speaking counties, exploring the variation in language only among this group.

Next, we consider an alternative measure of broadcast infrastructure. Additional to simply the number of radio stations provincially, we also observe the location of these stations. Under the assumption that wired broadcast network expanded concentrically from these stations, we calculate the distance to the nearest station from the centroid of each county as a proxy for the density of broadcast network of that county.

We find that the shift in violence varied systematically with proximity to the nearest radio station *only* for Mandarin speaking counties. Areas located near radio stations but with low mutual intelligibility with Mandarin dialect showed no differential increase in intensity of conflict while Mandarin speaking counties do. This stark contrast illustrates radio coverage was relevant only in Mandarin speaking locations.

The result is robust across several different definition of distance, using ln(Distance to Nearest

Station) as well as a dummy variable for being located within 120 km (mean distance) of radio station.

Altogether the findings illustrate linguistic barriers to the state capacity for unilateral persuasion.

4.3 Robustness

To further assess robustness, we successively include controls to our baseline specification that correspond to additional determinants of violence as described above. Our choice of additional controls is guided by the determinants of violence that have been emphasized in the literature. Because identification in our setting draws from the interaction of radio network and linguistic distance, a potential threat to identification is correlation between interaction of radio with other controls with language and vice versa.

Table 6 displays a correlation table relating both $Mandarin$ and $Radio\ Network$ to variables they might be associated with. This table motivates the full set of interaction we include. The inclusion of interacted controls allow the effect of any control we include to vary by the language of the county as well as the level of radio infrastructure provincially. Thus the residual variation captured by β is not conflated by differential impact of controls across our treatment.

The robustness results are shown in Table 7. Column (1) refers to our baseline specification. In the subsequent columns we successively add more controls; in column (2) and (3), we interact each of our baseline control with $Mandarin_c$ and also $Radio\ Network$ respectively.

In column (4), we control for crop suitability of the local soil (this includes suitability of grain, wheat, rice, and millet); in columns (5), we control for the interacted terms of agricultural suitability with both $Mandarin_c$ and $Radio\ Network$. This is motivated by the literature on effect of crop suitability on long run economic development.

In column (6) we include controls for historical development such as the number of civil service entrants and imperial exam qualifiers. This is included to capture the possible effect of economic development on the extent of the violence given the purported goal of punishing former land owners. In column (7) we interact these controls with $Mandarin_c$ and $Radio\ Network$.

We also include covariates that reflect incidences of historical conflict in column (8), given the persistence in conflict and culture that is documented in the literature. We control for conflict during the Taiping Rebellion as well as revolutionaries in the initial Republican revolution. These controls are interacted with $Mandarin_c$ and $Radio\ Network$ in column (9).

The last set of controls we include are monthly mean precipitation from 1966-1968 motivated by the literature that examines climate origins of conflict. The coefficient stays remarkably consistent and significant across all specifications. This alleviates concerns regarding our empirical strategy.

5 Individual Level and Mechanism

The previous section established that the intensity of the Great Leap Forward and Cultural Revolution were higher in Mandarin speaking areas with radio access. In this section, we provide evidence that a possible mechanism through which radios would lead to violence is through ideology. We examine individual decisions during and after exposure to Cultural Revolution ideology. Communist ideology has been documented to have a persistent effect on preferences and attitudes (Alesina and Fuchs-Schündeln (2007b)). The Cultural Revolution was a grass roots movement which relied on the participation of the masses, not a central governing force. The movement was oddly peaceful in that the radio propaganda did not promote hate; on the contrary, the propaganda promoted social order and the idea of working toward a greater good. Unlike during the Rwandan genocide, the radio did not promote ethnic divisions (Yanagizawa-Drott (2014)). Thus, the government heavily relied on ideology to encourage people to action.

The two outcomes we study are contemporaneous participation in the send down movement during the Cultural Revolution, and joining the Communist party later in life. The send down movement, as discussed in the historical background section, while a generalized compulsory policy administered to high school students at large, was also specifically aimed at dispersing Red Guards from concentrated urban areas and many former Red Guards had volunteered to participate out of ideological zealotry. Around 15% of individuals who were sent down volunteered because of a genuine belief in the revolutionary agenda (Pan (2003)). More also volunteered through coercion and persuasion from government propaganda. Hence sent down participation can be considered a proxy for revolutionary behavior and the influence of propaganda.

The second outcome examines persistence of revolutionary beliefs. Joining the Communist Party later in life is an indicator of the persistence of Communist ideology.

The identification strategy will involve a difference-in-differences strategy in which we focus on those who lived through the Cultural Revolution during their youth, or the *impressionable years*, and compare the difference for Mandarin versus non-Mandarin native speakers during this time period.

5.1 Empirical Strategy: Effects of Propaganda on Revolutionary Activity

We investigate the effect of propaganda on ideology, for age cohorts who are most likely to be swayed by ideology. Using a difference-in-differences approach, we use comprehension of Mandarin as a channel for the influence of propaganda, and study if youth at the start of the Cultural Revolution who comprehend Mandarin are more likely to be revolutionary. This would be evidence language is a channel through which propaganda propagates.

We focus on teenage cohorts due to evidence from the *impressionable years hypothesis*, which states that the historical environment to which one is exposed to during the transition between adolescence and adulthood has a profound impact on one's attitudes and world views. After this time of plasticity, beliefs become set and become permanent afterwards. Young adults are especially vulnerable to shifts in attitudes in political beliefs (Alwin and Krosnick (1991), Flanagan and Sherrod (1998)). There is no consensus for which ages exactly are the impressionable ages. Some see the age of 18 as the end point, but others see the process of socialization lasting until the age of 25. In addition to the psychology literature, the history of the Cultural Revolution itself also suggests that adolescents might be the most influenced by propaganda during this time period. The Red Guard movement specifically targeted youth to join the revolutionary cause, and most Red Guards were between 12 and 17 years old (Jing (1991)). For this reason, we will define the age group of 10-21 as the impressionable years, and explore robustness to these age categories later in the paper. Using the 10-21 age group incorporates both the historical details of the Red Guards during the Cultural Revolution as well as evidence from psychology literature outlining the most impressionable years.

The Cultural Revolution was not the first instance in history during which youth were the targets of propaganda. During the Nazi regime in Germany, youth were similarly targeted due to their naivete (Hoffmann (1996)). Giuliano and Spilimbergo (2014) examines outcomes on beliefs among those who lived through recessions during their impressionable years. Medical literature has also found strong associations between adolescents and risky behavior (Escobar-Chaves and Anderson (2008), Klein et al. (1993)).

We thus explore the effects of understanding Mandarin among the cohorts for whom propaganda was the most salient. Since the outcome variable, revolutionary activity, is not directly recorded in the data, we use proxies for this: joining the Communist Party within 45 years of birth (*Communist*) and participation in the send down movement (*send down*). Joining the Communist Party was a rigorous process in which decisions were made on the basis of applicants' ideological criteria. The send down movement targeted the most revolutionary youth, in order to diffuse violence in the cities. The difference-in-differences regression we estimate is as follows:

$$activity_{ijc} = \alpha mandarin_i + \gamma CR\ cohort_j + \delta CR\ cohort_j * mandarin_i + \omega_c + X_i\beta + \epsilon_{ijc} \qquad (4)$$

In the equation above, $activity_{ijc}$ denotes the revolutionary intensity of individual i born in county c. The independent variable, $CR\ cohort$ is a dummy variable for belonging to the 10-21 age cohort at the start of the Cultural Revolution, $mandarin_i$ is a dummy for speaking Mandarin at home, ω_c is a county fixed effect, and X_i is a vector of individual level controls, including gender, education, age, age squared, father's education, mother's education, father's political party, mother's political party, father's occupation, mother's occupation, birth county, urban area of residence dummy, father's birth year, mother's birth year, own birth year, ethnicity, and parents' hukou status.

Additional controls include interactions between CR Cohort and education, gender, urban dummy, birth province, and ethnicity. The coefficient of interest is δ, the coefficient on the interaction term, which measures the effect of speaking Mandarin for the Cultural Revolution cohort. Appleton et al. (2009) find that being male and educated increases Communist Party membership.

We also explore robustness to this specification, by using 5-year birth cohort dummies instead of specifying the Cultural Revolution Cohort. The regression specification is as follows:

$$activity_{ijc} = \alpha mandarin_i + \sum_j \gamma_j birth\ cohort_j + \sum_j \delta_j birth\ cohort_j * mandarin_i + \omega_c + X_i\beta + \epsilon_i \tag{5}$$

In the equation above, $activity_{ijc}$ denotes the revolutionary activity, as proxied by *communist, send down*, and *send down duration*, of individual i born in county c of birth cohort j. The independent variables, $birth\ cohort_j$ are a set of dummies for the age category that an individual belongs to at the start of the Cultural Revolution. The birth cohort categories are 30 and older, 25 to 30, 20 to 25, 15 to 20, 10 to 5, and 5 to 0 at the start of the Cultural Revolution in 1966. We explore robustness to these age categories as well. The controls are the same as Equation 4, except instead of interacting the $CR\ cohort$ with individual controls, $birth\ cohort_j$ is interacted with Han ethnicity. The coefficient of interest is δ_j, the set of coefficients on the interaction term between $birth\ cohort_j$ and $mandarin_i$. This coefficient gives the effect of propaganda on being revolutionary, measured through the channel of speaking Mandarin at home, on those individuals belonging to a particular birth cohort.

5.2 Results: Effects of Propaganda on Revolutionary Activity

Table 9 displays the results for estimating Equation 4, the individual level analysis of the effects of propaganda on revolutionary activity, measured through a linguistic channel. In this specification, we find that belonging to the Cultural Revolution Cohort (those aged 10-21 at the start of the Cultural Revolution) and speaking Mandarin at home has a significant effect on revolutionary activity. The first column shows the results using joining the Communist Party within 45 years of birth as the dependent variable, and the second column shows the results using participation in the send down movement as the dependent variable. The coefficients of interest are the coefficients of *CR Cohort x Mandarin*. In the first column, we find that individuals who speak Mandarin and belong to the Cultural Revolution Cohort are 5.6 percentage points more likely to have joined the Communist Party. The table shows evidence that those who spoke Mandarin at home were significantly more likely to join the Communist Party, but only among those who were aged 10-21 at the start of the Cultural Revolution.

As a robustness check, instead of focusing on the Cultural Revolution Cohort, we use 5-year evenly spaced birth cohorts. This would determine if living through the Cultural Revolution during one's

impressionable years has more of an impact than living through this time period during other years. We display the set of coefficients δ_j from Equation 5 in Figure 3. This figure plots out the coefficients on the interaction term, *Mandarin x Birth Cohort*, for each 5 year interval of age cohort. In this figure, it is evident that a jump in the coefficient of *Mandarin x Birth Cohort* occurs among those who were teenagers at the start of the Cultural Revolution (highlighted by the red circles). In Figure 1, we demonstrate evidence for the parallel trends assumption: controlling for covariates, Mandarin speakers and non-Mandarin speakers join the Communist Party at approximately the same rate, except for the Cultural Revolution Cohort (the estimates for the 1951 and 1956 cohorts between the two vertical red lines). This indicates that Mandarin speakers were no different from non Mandarin speakers, except during the time period of the Cultural Revolution. The points plotted here are the level effects for Mandarin speakers and non-Mandarin speakers joining the Communist Party. Reinforcing our county level analysis, we find that comprehension of Mandarin has a significant effect on revolutionary activity, suggesting that language was indeed a barrier to transmission of state ideology.

In Column 2 of Table 9, we present the analogous results to Column 1, using a dummy for participating in the send down movement as the dependent variable. We find that like the results in Column 1, the effects on participating in this movement are most pronounced for youths aged 10-21 at the start of the Cultural Revolution. Analogously to Figure 1, Figure 2 plots out the trends for participating in the send down movement for Mandarin speakers and non Mandarin speakers over time. Again, Mandarin speakers of the Cultural Revolution cohort were significantly more likely to participate in the send down movement than non Mandarin speakers. In the case of the send down movement, we see a differential effect between Mandarin and non Mandarin speakers for youth aged 5-10, in addition to the Cultural Revolution Cohort. Due to the historical circumstances of the Cultural Revolution, this still aligns with our hypothesis that propaganda during the Cultural Revolution was more salient for Mandarin speakers. It is plausible that youth aged 5-10 were influenced by the propaganda during this time period.

Table 10 also shows results for a falsification test, where instead of using the Cultural Revolution Cohort as the treated cohort, we examine other cohorts to see if the effect of speaking Mandarin for these cohorts is significantly different from zero for these cohorts. We use the baseline specification, Equation 4. The birth cohorts are 0-9, 10-21 (Cultural Revolution Cohort), 22-32, 33+, and born after the Cultural Revolution. These birth cohorts are used to roughly be the same length of time as the Cultural Revolution Cohort. We find that for cohorts other than the Cultural Revolution cohort, there is no significant difference in revolutionary activity between Mandarin speakers and non Mandarin speakers.

The fact that we find cohort effects only among Mandarin speakers also lends credence to our identification strategy of using linguistic variation as a channel for revolutionary activity. At a county as well as individual level, we find that speaking Mandarin has significant effects on

participation in the Cultural Revolution.

6 Conclusion

In this paper we utilize a previously unexplored institutional detail of a widely studied historical phenomenon, the Chinese Cultural Revolution, to study the causal impact of state sponsored propaganda on collective conflict and long term individual outcomes. Our identification strategy illuminates the linguistic constraints to state capacity and contextualizes the effect of ethnolinguistic fractionalization.

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7 Tables & Figures

Table 1: Summary statistics

Variable	Mean	Std. Dev.	N
Dependent Variables			
Mandarin	0.188	0.391	28746
Communist	0.08	0.272	28746
Independent Variables			
Age	54.628	13.834	28746
Gender	0.486	0.5	28746
Urban	0.469	0.499	28746
Education	2.402	1.317	28736
Father's Education	1.779	1.052	22999
Mother's Education	1.364	0.763	24458
Member of a democratic Party (Mother)	0.0005	0.022	22636
Member of communist youth league (Mother)	0.014	0.116	22636
General public (Mother)	0.964	0.184	22636
Member of a democratic Party (Father)	0.002	0.049	22203
Member of communist youth league (Father)	0.014	0.118	22203
General public (Father)	0.838	0.369	22203

Note: Tolerance of Inequality and Materialism range from 1 to 5. Sent Down Duration is truncated at 40 years. Education values range from 1 to 8, in increasing level of education. All other variables are binary.

Table 2: Individual Level: Mandarin Speakers vs. Non Mandarin Speakers

	Non Mandarin Speaking			Mandarin Speaking		
Variable	**Mean**	**Std. Dev.**	**N**	**Mean**	**Std. Dev.**	**N**
Percent Female	0.487	0.5	27399	0.473	0.499	6201
Education	4.734	3.623	27391	6.009	3.833	6199
Urban	0.429	0.495	27399	0.619	0.486	6201
Father's Education	1.865	1.075	22537	2.186	1.225	5132
Mother's Education	1.431	0.816	23805	1.779	1.085	5369
Age	50.573	16.506	27399	50.15	15.956	6201

Note: Education values range from 1 to 8, in increasing level of education. Urban is a binary variable.

Table 3: County Level: Mandarin Speakers vs. Non Mandarin Speakers

	Non Mandarin Speaking			Mandarin Speaking			
Variable	**Mean**	**Std. Dev.**	**N**	**Mean**	**Std. Dev.**	**N**	**p-value**
Non Agricultural Population	0.1	0.107	516	0.101	0.212	984	0.461
Male/Female Ratio 1964	1.082	0.166	516	1.056	0.086	984	1.000
Number of Households 1964	6.535	7.696	516	7.142	5.553	984	0.040
Township 1964	0.022	0.148	893	0.066	0.248	1529	0.000
Total Population 1964	2.779	3.467	516	3.139	2.400	984	0.0095
Industrial Population 1982	11.96	10.774	601	9.59	11.626	1102	1.000
Employed 1982	50.008	6.177	601	51.043	5.203	1102	0.0003
GDP 1982	558.612	597.683	601	527.858	611.255	1102	0.8413
Male/Female Ratio 1982	1.062	.0687	601	1.052	.0484	1102	0.9998
Illiterate 1982	36.131	16.316	601	36.464	13.201	1102	0.3239

Note: Non Agricultural Population, Industrial Population, Employed, and Illiterate are percents of total population. Number of Households is measured in 10,000 and Total Population is measured in 100,000.

Table 4: Media and Intensity of Conflict: Mandarin Indicator

	Dep Var: Percent of Population Killed				
	(1)	(2)	(3)	(4)	(5)
Radio Network (Number of Radio Stations Within the Province)	0.012***	–	-0.007**	-0.004	-0.003
	(0.002)		(0.003)	(0.004)	(0.007)
Mandarin	–	0.022**	-0.058***	-0.055	-0.060*
		(0.010)	(0.017)	(0.027)	(0.045)
Radio Network x Mandarin Dummy	–	–	0.011***	0.015**	0.015**
			(0.003)	(0.007)	(0.007)
Control variables					
Geographic Controls	X	X	–	X	X
Baseline Controls	–	–	–	X	X
Great Leap Forward Controls	–	–	–	–	X
Observations	1882	1943	1943	1330	1330
Clusters:	98	98	98	87	87
R^2	0.130	0.223	0.024	0.114	0.112

Note: The dependent variable in each column is the percent of the population killed in each county attributed to the Cultural Revolution. In addition to the displayed covariates, each column also include a set of geographic controls which include a polynomial function of latitude and longitude of the county centers as well as classification of the size of cities. The first column presents selected coefficients from the estimation of 1. The coefficient of interest is the *Radio Density* variable which is the number of radio stations provincially. The second column provides the estimation result of 2. The independent variable of interest is *Mandarin Dummy* which is an indicator dummy that is one if the primary dialect spoken in a county belongs to the Mandarin family. Column 3 is the regression of violence on Radio Network, Mandarin dummy, and their interaction. Column 4 presents our main empirical specification, 3. The coefficient of interest is the interaction of *Mandarin Dummy* and *Radio Density*. Fifth column adds additional control variables for intensity of GLF. The coefficient of interest is remarkably consistent across specifications, regardless of controls. Standard Errors clustered at the dialect level * $p < .10$, ** $p < .05$, *** $p < .01$

Table 5: Media and Intensity of Conflict: Functional Comprehension

	Dep Var: Percent of Population Killed			
	(1)	(2)	(3)	(4)
Radio Network (Number of Radio Stations Within the Province)	–	-0.040*	-0.041**	-0.050**
		(0.024)	(0.016)	(0.023)
Experimental Intelligibility (% of Mandarin Words Comprehended)	0.080*	-0.255	-0.186	-0.106
	(0.039)	(0.169)	(0.113)	(0.162)
Radio Network x Experimental Intelligibility	–	0.053*	0.066**	0.081**
		(0.025)	(0.026)	(0.036)
Control variables				
Geographic Controls	X	–	X	X
Baseline Controls	–	–	X	X
Great Leap Forward Controls	–	–	X	X
Counties in Sample	all	all	all	non-Mandarin
Observations	1936	1927	1314	547
Clusters:	98	90	79	46
R^2	0.219	0.026	0.117	0.132

Note: The dependent variable in each column is the percent of the population killed in each county because of the Cultural Revolution. In addition to the covariates that are displayed in the table, each column also include a set of geographic controls which include a polynomial function of latitude and longitude of the county centers as well as classification of the size of cities. The first column provides the estimation result of 2 but now with a continuous measure of intelligibility. The independent variable of interest is *Experimental Intelligibility* is a number between 0 and 1 indicating the % of Mandarin words correctly identified by the sample of 160 respondents for each dialect group in the linguistic experiment described in the paper. Column two presents our main empirical specification, 3, but now interacted with *Experimental Intelligibility* The coefficient of interest is the interaction of *Experimental Intelligibility*and *Radio Density*. The last column is the regression of second column but restricted only to sample of Non Mandarin counties. Standard Errors clustered at the dialect level
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 6: Correlation Table

Variable	Obs.	Mandarin	Radio
Mandarin	2177	1	0.0011
Ruggedness (mean)	2104	-0.0794	-0.2599
		(0.0003)	(0)
Ruggedness (S.D)	2104	0.172	0.0636
		(0)	(0.0035)
Ruggedness (median)	2104	-0.0697	-0.2358
		(0.0014)	(0)
Railroad Access	2104	0.0611	0.1682
		(0.0051)	(0)
Distance to provincial capital	2104	-0.012	0.0787
		(0.5815)	(0.0003)
1982 Illiteracy Rate	1900	0.0978	-0.209
		(0)	(0)
ln(distance to Beijing)	2176	-0.1034	-0.1068
		(0)	(0)
ln(county population)	2086	0.1524	0.1474
		(0)	(0)
Buddhist temple	2177	-0.0369	-0.0252
		(0.0849)	(0.2405)
ln(province population)	2160	0.073	0.01
		(0.0007)	(0.6424)
ln(province area)	2177	0.1113	0.0387
		(0)	(0.0714)
ln(county area)	2177	-0.0211	0.0887
		(0.3252)	(0)
Non-agricultural population	2086	-0.0156	0.1807
		(0.4765)	(0)
Gender ratio	2086	-0.1464	0.1328
		(0)	(0)
ln(households)	2086	0.1271	0.1284
		(0)	(0)
Township	2177	0.0356	0.0377
		(0.0968)	(0.0786)
Linguistic fractionalization	2177	-0.1209	-0.0032
		(0)	(0.8806)
% Participation in Communal Dining GLF	2086	-0.0016	-0.5842
		(0.9418)	(0)
% Purged during 1957 Anti-right movement	2078	0.1664	-0.165
		(0)	(0)
Steel per capita growth GLF	2177	-0.0632	-0.0106
		(0.0032)	(0.6197)
Autonomous Territory	2177	0.1335	-0.0626
		(0)	(0.0035)
Main river	1454	0.1798	0.0748
		(0)	(0.0043)
Treaty Port	1454	-0.1227	-0.0862
		(0)	(0.001)
Coast	1454	-0.215	-0.187
		(0)	(0)

Note: The column labeled *Mandarin* is a column of all the correlation coefficients of the listed variables with Mandarin. The column labeled *Radio* is a column of all the correlation coefficients of the listed variables with radios in each province.

Table 7: Robustness

	(1) Base Spec	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Mandarin Dummy										
Radio Network x Mandarin Indicator	0.015**	0.015**	0.021**	0.018**	0.022***	0.014**	0.016**	0.014**	0.013**	0.016***
	(0.007)	(0.007)	(0.009)	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)
Baseline controls:	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
X Mandarin Indicator:	N	Y	N	N	N	N	N	N	N	N
X Radio Network:	N	N	Y	N	N	N	N	N	N	N
Agricultural Suitability:	N	N	N	Y	Y	N	N	N	N	N
X Mandarin Indicator:	N	N	N	N	Y	N	N	N	N	N
X Radio Network:	N	N	N	N	Y	N	N	N	N	N
Historical Development:	N	N	N	N	N	Y	Y	N	N	N
X Mandarin Indicator:	N	N	N	N	N	N	Y	N	N	N
X Radio Network:	N	N	N	N	N	N	Y	N	N	N
Historical Conflict:	N	N	N	N	N	N	N	Y	Y	N
X Mandarin Indicator:	N	N	N	N	N	N	N	N	Y	N
X Radio Network:	N	N	N	N	N	N	N	N	Y	N
Monthly Precipitation 1966-1968:	N	N	N	N	N	N	N	N	N	Y
Observations	1330	1330	1330	1369	1369	1330	1330	1330	1330	347
R^2	0.114	0.116	0.131	0.116	0.128	0.123	0.130	0.120	0.122	0.266
Panel B: % of Mandarin Words Comprehended										
Radio Network x Experimental Intelligibility	0.066**	0.063**	0.099***	0.072**	0.112***	0.065**	0.070**	0.064**	0.062**	0.079***
	(0.026)	(0.026)	(0.036)	(0.028)	(0.030)	(0.027)	(0.028)	(0.026)	(0.026)	(0.017)
Baseline controls:	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
X Mandarin Indicator:	N	Y	N	N	N	N	N	N	Y	N
X Radio Network:	N	N	Y	N	N	N	N	N	Y	N
Agricultural Suitability:	N	N	N	Y	Y	N	N	N	Y	N
X Mandarin Indicator:	N	N	N	N	Y	N	N	N	Y	N
X Radio Network:	N	N	N	N	Y	N	N	N	Y	N
Historical Development:	N	N	N	N	N	Y	Y	N	N	N
X Mandarin Indicator:	N	N	N	N	N	N	Y	N	N	N
X Radio Network:	N	N	N	N	N	N	Y	N	N	N
Historical Conflict:	N	N	N	N	N	N	N	Y	Y	N
X Mandarin Indicator:	N	N	N	N	N	N	N	N	Y	N
X Radio Network:	N	N	N	N	N	N	N	N	Y	N
Monthly Precipitation 1966-1968:	N	N	N	N	N	N	N	N	N	Y
Observations	1314	1314	1314	1353	1353	1314	1314	1314	1314	342
R^2	0.117	0.120	0.142	0.119	0.132	0.128	0.133	0.123	0.125	0.289

Note: This table examines the stability of the result with different sets of control variables. In the first column, we present the baseline specification which corresponds to column 4 in Table 4. Then in the remaining specifications we successively include more robust set of controls. Standard Errors clustered on the province level * $p < .10$, ** $p < .05$, *** $p < .01$

Table 8: Propaganda and Intensity of Conflict: Distance from Radio Stations

	(1) distance in km	(2) log(distance)	(3) within 120km
Non-Mandarin Speakers × distance in km	-0.000	–	–
	(0.001)		
Mandarin × distance in km	-0.001***	–	–
	(0.000)		
Non-Mandarin Speakers × log(distance)	–	0.003	–
		(0.008)	
Mandarin × log(distance)	–	-0.006	–
		(0.005)	
Non-Mandarin Speakers × $\mathbb{1}${distance < 120km}	–	–	-0.019
			(0.022)
Mandarin × $\mathbb{1}${distance < 120km}	–	–	0.015*
			(0.008)
Control variables			
Linguistics controls	X	X	X
Geographic controls	X	X	X
Historical Buddhist Temples	X	X	X
Great Leap Forward Intensity	X	X	X
Census data: 1964	X	X	X
Observations	1943	1943	1943
R^2	0.082	0.079	0.081

* $p < .10$, ** $p < .05$, *** $p < .01$

Note: This table provides results from alternative specification where we examine the relationship between distance to radio stations and degree of violence. The dependent variable in each specification is percent of population killed. "distance in km" is the distance in kilometers to nearest radio station. "log(distance" is the log of distance in km. $\mathbb{1}${distance < 120km} is an indicator variable for if the nearest radio station is within 120km which is the median distance. The same set of control variables as Table 4 is included. Standard errors are clustered on the province level * $p < .10$, ** $p < .05$, *** $p < .01$

Table 9: Revolutionary Activity of Mandarin Speakers of the Cultural Revolution Cohort

	(1) Communist Party	(2) Sent Down
Mandarin x CR Cohort	0.056***	0.043**
	(0.019)	(0.019)
Mandarin	0.012	-0.005
	(0.018)	(0.009)
CR Cohort	0.012*	0.013**
	(0.007)	(0.005)
Age	-0.002	0.002***
	(0.002)	(0.001)
Age^2	0.000***	-0.000
	(0.000)	(0.000)
Female	0.059***	0.002
	(0.005)	(0.002)
Level of education (crude)	0.064***	0.004***
	(0.003)	(0.001)
Urban area (Census Bureau's definition)	0.015*	0.006***
	(0.009)	(0.002)
Father's level of education (detailed)	-0.005*	0.000
	(0.003)	(0.002)
Mother's level of education (detailed)	0.004	-0.007***
	(0.005)	(0.002)
Observations	13350	13350
R^2	0.231	0.296

* $p < .10$, ** $p < .05$, *** $p < .01$

Note: Each column presents the estimated OLS coefficients of equation 4 with a different outcome variable measuring individual ideology. These outcomes are: joining the Communist Party within 45 years of birth (1) and participating in the send down movement (2). *CR Cohort* equals 1 for individuals born in the Cultural Revolution Cohort, i.e. those aged 10 to 21 at the start of the Cultural Revolution. *Mandarin* is dummy variable imputed from self reported language spoken at home. The coefficient of interest is the interaction of *mandarin* and *CR Cohort*, which is interpreted as the differences in differences estimate. Controls include a county level fixed effect, and individual level controls including gender, education, age, age squared, father's education, mother's education, father's political party, mother's political party, father's occupation, mother's occupation, birth county, urban area of residence dummy, father's birth year, mother's birth year, own birth year, ethnicity, and parents' hukou status. Additional controls include interactions between CR Cohort and education, gender, urban dummy, birth province, and ethnicity. Coefficients on parental political status are with respect to parental membership in the Communist party as baseline. The coefficient of interest is δ, the coefficient on the interaction term, which measures the effect of speaking Mandarin for the Cultural Revolution cohort.Standard errors are clustered on the last known county of residence before the Cultural Revolution, and county of birth if born after the Cultural Revolution.

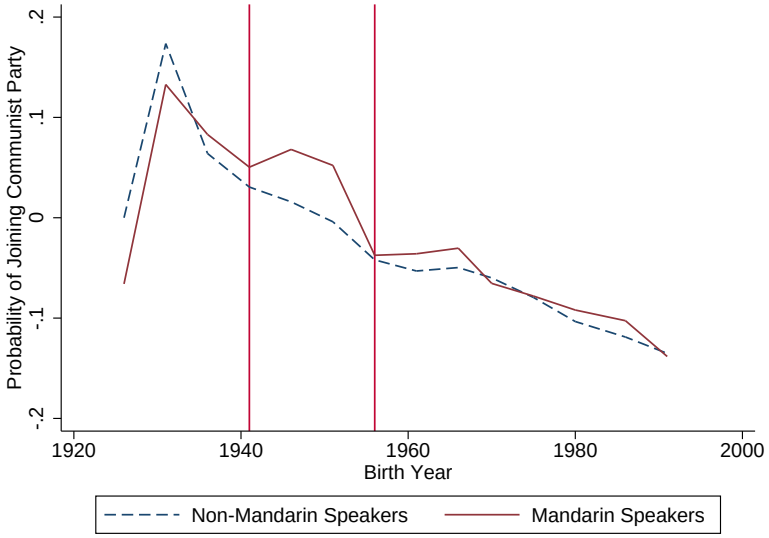
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 10: Falsification Test Revolutionary Activity

	(1) Communist	(2) Sent Down
Panel A: Born After CR		
Mandarin x Birth Cohort Born After CR	-0.027	-0.034
	(0.071)	(0.023)
Observations	13350	13350
R^2	0.217	0.292
Panel B: Age 0 to 9 at Start of CR		
Mandarin x Birth Cohort 0-9	0.005	-0.004
	(0.013)	(0.008)
Observations	13350	13350
R^2	0.218	0.293
Panel B: Age 10 to 21 at Start of CR		
Mandarin x Birth Cohort 10-21	0.058***	0.043**
	(0.019)	(0.019)
Observations	13350	13350
R^2	0.218	0.296
Panel C: Age 22 to 32 at Start of CR		
Mandarin x Birth Cohort 22-32	-0.005	-0.000
	(0.037)	(0.014)
Observations	13350	13350
R^2	0.217	0.293
Panel D: Age 33+ at Start of CR		
Mandarin x Birth Cohort 33+	-0.027	-0.034
	(0.071)	(0.023)
Observations	13350	13350
R^2	0.217	0.292

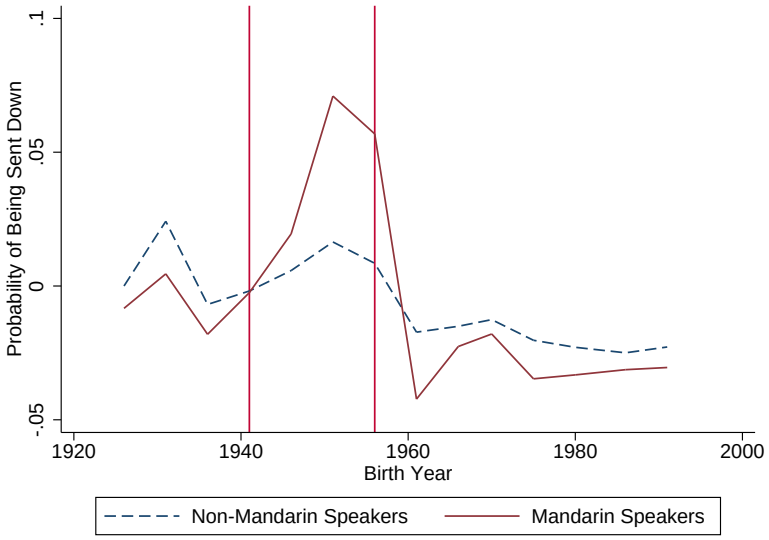
Note: Each row represents a different regression estimation of 4 using different age cohorts at the start of the Cultural Revolution, including the 10-21 year old Cultural Revolution Age Cohort. All regressions include full set of province and county fixed effects (not reported). Additional controls include hukou status, and ethnicity. Standard errors are clustered on the last known county of residence before the Cultural Revolution, and county of birth if born after the Cultural Revolution. * $p < .10$, ** $p < .05$, *** $p < .01$

Figure 1: Communist Party Membership: Coefficients of Mandarin x Age Cohort



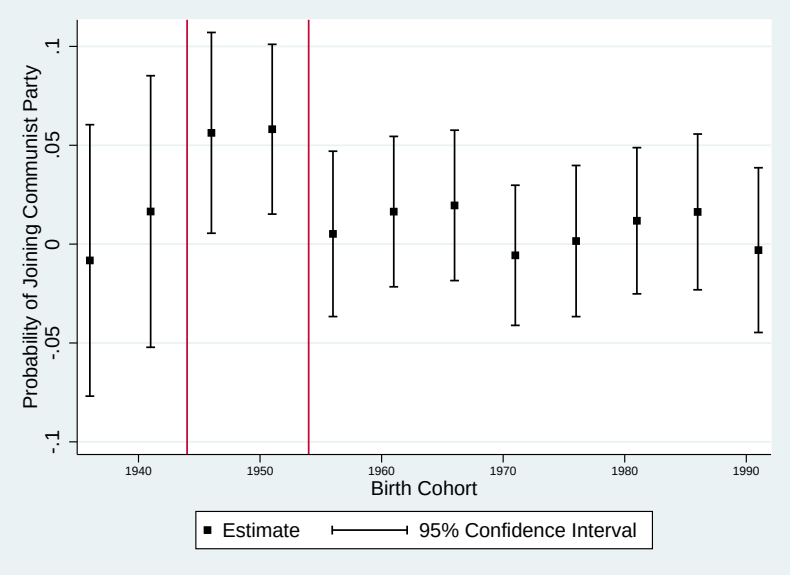
Note: This figure plots trends in Communist Party participation between Mandarin and Non Mandarin speakers. The left hand side is a dummy for joining the Communist party within 45 years of birth. In reference to equation 5, γ is the trend for non Mandarin speakers, and $\gamma + \delta$ is the trend for Mandarin speakers. The birth cohorts within the red vertical lines indicate the cohorts the Cultural Revolution cohorts who are between 10 and 21 at the start of the Cultural Revolution. Controls include a county level fixed effect, and individual level controls including gender, education, age, age squared, father's education, mother's education, father's political party, mother's political party, father's occupation, mother's occupation, birth county, urban area of residence dummy, father's birth year, mother's birth year, own birth year, ethnicity, and parents' hukou status. Additional controls include interactions between birth cohort and Han ethnicity. Coefficients on parental political status are with respect to parental membership in the Communist party as baseline. Standard errors are clustered on the last known county of residence before the Cultural Revolution, and county of birth if born after the Cultural Revolution.

Figure 2: Participation in the Send Down Movement: Coefficients of Mandarin x Age Cohort



Note: This figure plots trends in send down movement participation between Mandarin and Non Mandarin speakers. The left hand side is a dummy for participation in the send down movement. In reference to equation 5, γ is the trend for non Mandarin speakers, and $\gamma + \delta$ is the trend for Mandarin speakers. The birth cohorts within the red vertical lines indicate the cohorts the Cultural Revolution cohorts who are between 10 and 21 at the start of the Cultural Revolution. The regression includes a full set of province and county fixed effects. Additional controls include parental occupation, parental income, migration history, hukou status, parental hukou status, ethnicity, parent political party affiliations, and interactions between birth cohort and Han ethnicity. Coefficients on parental political status are with respect to parental membership in the Communist party as baseline. Standard errors are clustered on the last known county of residence before the Cultural Revolution, and county of birth if born after the Cultural Revolution.

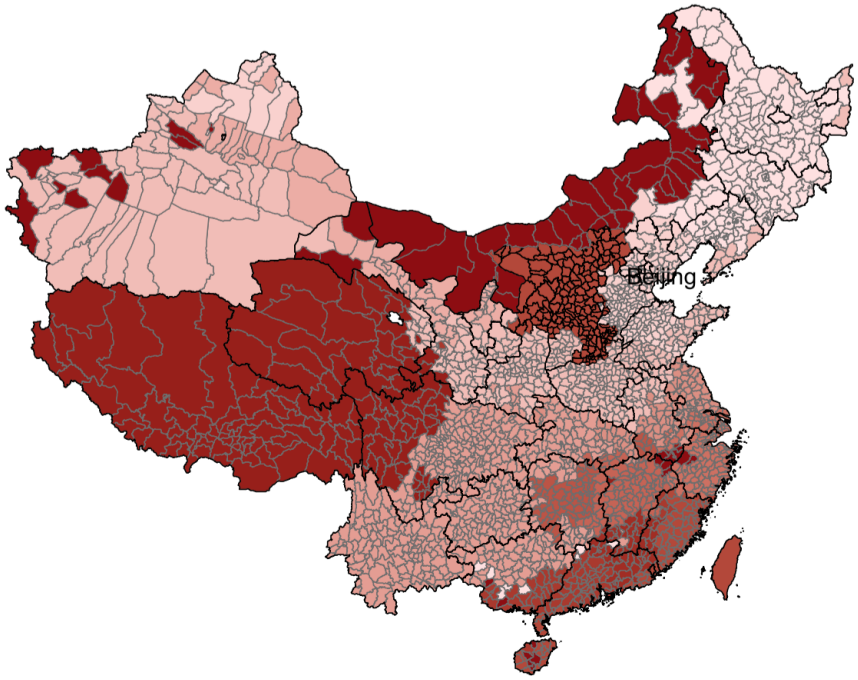
Figure 3: Joining the Communist Party: Coefficients of Mandarin x Age Cohort



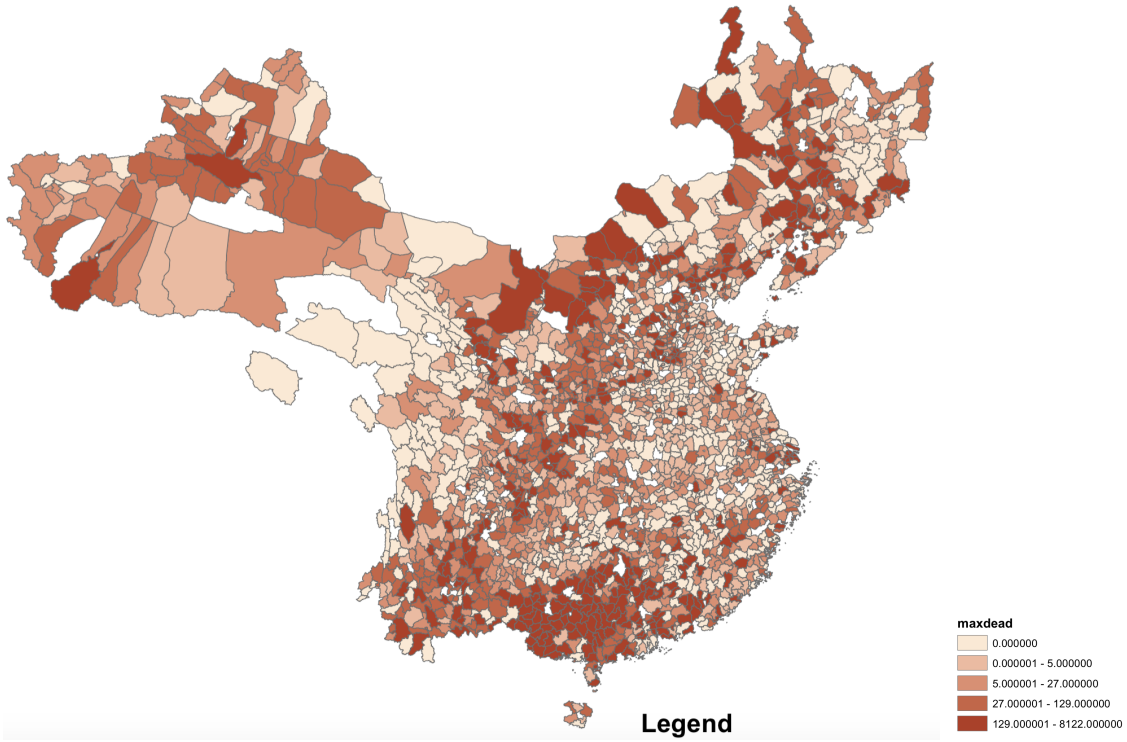
Note: This figure plots the regression coefficients of the birth cohort dummies defined on 5 year intervals interacted with Mandarin speaking dummy from the regression of Communist Party participation on birth cohorts and individual control variables. The point estimate is represented by the square and the interval correspond to the 95 % confidence interval. We see that the coefficient on the interaction of Mandarin and birth cohort dummy is only statistically significant for the Cultural Revolution birth cohorts, confirming that Mandarin and Non Mandarin political behavior is only different for those birth cohorts.

Figure 4: Language and Violence

(a) Vernacular Dialects in China



(b) Cultural Revolution Violence



Note:

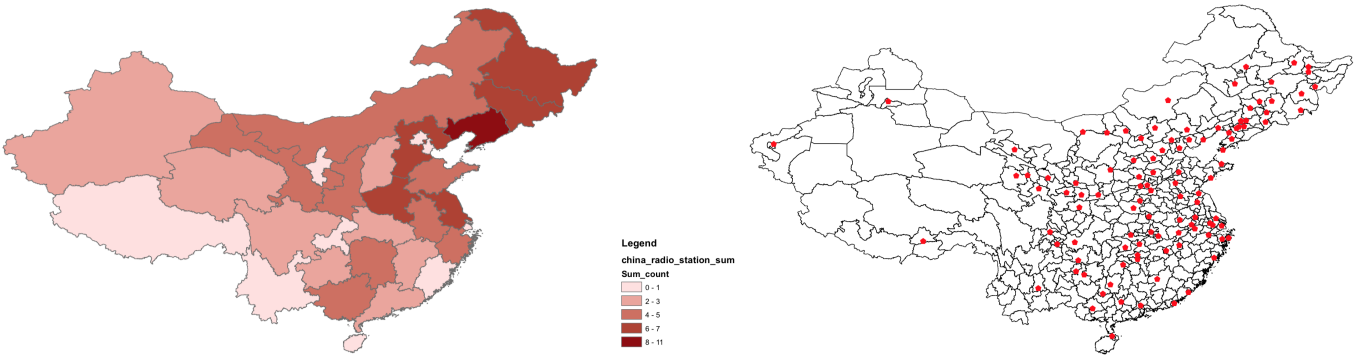
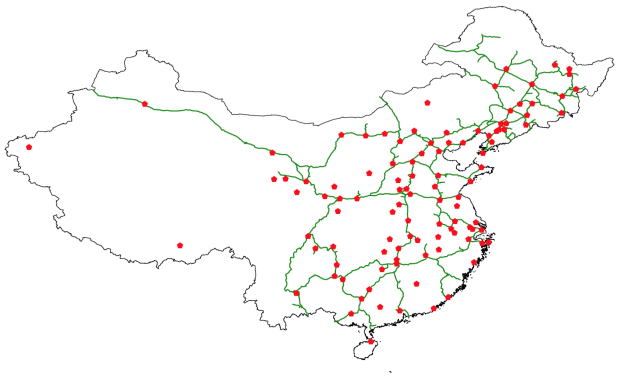


Figure 5: Distribution of Radio Stations

Figure 6: Determinants of Radio Stations

(a) Railroad and Radio Stations



(b) Rivers, Railroads, and Radio Stations

Note:

Figure 7: Mandarin Comprehension

Speaker dialect	Listener dialect															
	Suzhou	Wenzhou	Guangzhou	Xiamen	Fuzhou	Chaozhou	Meixian	Nanchang	Changsha	Taiyuan	Beijing	Jinan	Hankou	Chengdu	Xi'an	Mean
Suzhou	**77**	7	5	18	13	5	7	13	13	20	5	18	15	15	7	16
Wenzhou	5	**93**	5	12	3	2	7	10	2	7	2	10	8	7	2	10
Guangzhou	5	7	**92**	10	20	25	55	22	13	7	3	22	8	17	7	21
Xiamen	13	5	8	**97**	23	28	13	18	13	3	5	15	7	17	8	18
Fuzhou	3	3	2	17	**92**	7	3	8	5	0	0	7	2	0	3	10
Chaozhou	7	0	3	52	13	**98**	3	12	3	7	2	13	10	3	5	15
Meixian	13	2	12	28	17	20	**70**	25	18	10	3	25	15	25	8	19
Nanchang	28	13	20	25	27	17	33	**50**	32	35	18	53	43	37	23	30
Changsha	12	3	8	23	17	3	17	25	**93**	13	13	38	53	28	2	23
Taiyuan	63	35	45	63	57	25	55	68	68	**73**	77	92	92	85	73	65
Beijing	87	62	90	90	93	60	80	78	92	90	**98**	98	97	98	93	87
Jinan	52	27	32	48	48	15	40	60	70	75	77	**97**	83	82	67	58
Hankou	48	32	32	52	53	27	45	53	62	58	67	95	**100**	73	65	57
Chengdu	47	22	40	48	72	27	48	58	62	65	62	98	95	**95**	68	60
Xi'an	53	33	50	58	57	30	57	58	63	68	58	82	78	70	**67**	59
Mean	34	22	30	43	40	26	36	37	41	35	33	51	47	43	33	

Figure 8: Percent dead by county Histogram

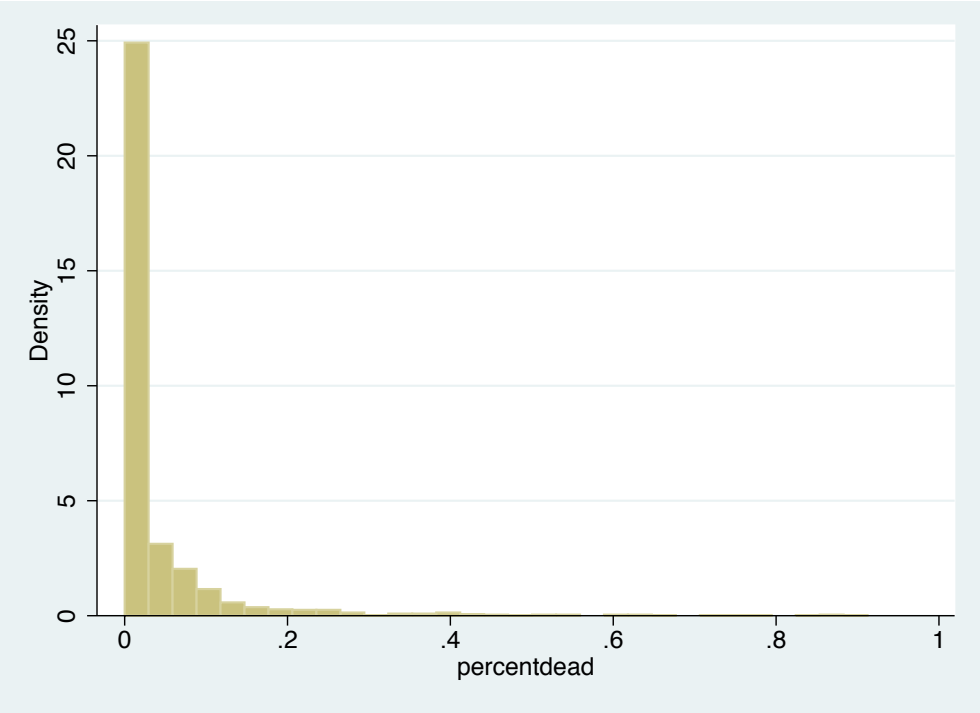


Figure 9: Loudspeaker Photo

Figure 10: Language Dendrogram