Mass Persuasion and the Ideological Origins of the Chinese Cultural Revolution

Susan Ou\textsuperscript{1} and Heyu Xiong\textsuperscript{2} *

\textsuperscript{1}Analysis Group
\textsuperscript{2}Northwestern University

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Abstract

We study the role of media in the transmission of ideology during the Cultural Revolution. We develop a novel identification strategy by interacting the strength of radio signals and linguistic compatibility of local dialects to the broadcast language, Mandarin. A stronger signal is found to increase revolutionary intensity in counties where Mandarin was better understood. Through investigation of participation in the Send Down Movement, we provide evidence that one mechanism underlying our findings is the direct effect of exposure on individuals, even absent differences in local policies induced by media. The effects of propaganda are persistent, as evidenced by Communist Party membership in later life.

\*Ou: susan.ou@analysisgroup.com. Xiong: heyuxiong2018@u.northwestern.edu. We are grateful to Georgy Egorov, Joel Mokyr, Matt Notowidigdo, and Nancy Qian for generous advice and feedback on this work. We also thank Lori Beaman, Matthias Doepke, Joe Ferrie, Seema Jayachandran, Ruixue Jia, Cynthia Kinnan, Lee Lockwood, Mara Squicciarini, and participants of the Northwestern Applied Microeconomics Seminar, History Seminar, NBER Conference on the Chinese Economy, and DEVPEC Conference at UC Berkeley for helpful advice and comments. Heyu Xiong is grateful for financial support from the Balzan Foundation and Northwestern’s Center for Economic History.
1 Introduction

A striking aspect of authoritarian regimes during the 20th century is their ability to orchestrate mass campaigns over large geographic areas. Examples include the Red Terror under the Soviets, the organized killings of Jews in Nazi Germany, the “Killing Fields” of Khmer Rouge, and the Great Leap Forward in China. These violent movements frequently relied on the mobilization of civilians who were otherwise only tangentially connected to the political process. Ruling bodies wielded a level of “soft” power and administrative capacity previously unseen in history, which was made possible through the use of new communication technologies that allowed states to project influence across space more easily.

Recent literature has emerged discussing how such technology increased civilian participation in many different settings such as the Rwandan Genocide (Yanagizawa-Drott, 2014) and Nazi Germany (Adena et al., 2015; Voigtländer and Voth, 2014). These papers focus on short or medium-run outcomes and allow for the possibility that radio exposure matters because it affects both the local environment and because it persuades individuals to act (even absent changes in the local policy or enforcement). Our paper makes progress on this agenda by examining the short and long-run (up to 45 years after exposure) effect of media in a new context — the Chinese Cultural Revolution — and by providing evidence that individual persuasion is an important mechanism through which radio exposure affects outcomes.

The empirical setting we study is the Chinese Cultural Revolution (1966-1976), a period characterized by collective violence and political persecution. Violence against political opponents was state sanctioned, but perpetrated by ordinary citizens. Estimates of the number of fatalities range from 250,000 to 1.5 million, while the total number of victims, including those persecuted, exceeds 35 million. In the prelude to the Cultural Revolution, the Communist Party developed a sophisticated wired radio infrastructure from which politicized media was regularly broadcasted.

First, we show that state-sponsored media led to more killings during the Cultural Revolution at the county level. Next, using retrospective micro-data, we examine one mechanism through which media could have induced violence. We isolate the direct effect of persuasive communication on individuals by holding constant the contextual or place-based effects in the area exposed. In particular, we provide evidence that individual responses vary with

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1 We will discuss these papers in more detail later in the introduction.
2 The death toll exceeds some of the modern era’s worst incidents of politically-induced mortality, such as the Soviet “Great Terror” of 1937-38, the Rwandan genocide of 1994, and the Indonesian coup and massacres of suspected communists in 1965-66. The death figure also likely understates the true extent of the violence due to the presumably larger number of those who were imprisoned or otherwise persecuted.
exposure to media in an environment where policy is uniform. Finally, we investigate the long run consequences of exposure to state-sponsored media on life trajectories.

The main empirical challenge in estimating the effect of media is identifying exogenous variation in exposure. The method for establishing identification that has become standard in the media literature is to use the spatial variation in the predicted quality of broadcast signal. This was first developed in Olken (2009) and later refined in Yanagizawa-Drott (2014), Enikolopov et al. (2011), and DellaVigna et al. (2014). While compelling, a concern is that the geographic variation in reception may be correlated with unobserved factors that can affect the outcomes of interest. We address this concern by introducing a second source of variation: the linguistic proximity of the local dialect to the broadcast language: Standard Mandarin, which was mandated for use in all central broadcasts.

Our county-level analysis uses a difference-in-differences strategy to jointly exploit these two sources of variation. This dramatically relaxes the identification assumptions. We examine the contemporaneous effects of radio on local revolutionary intensity. Specifically, we regress the number of killings directly attributed to the Cultural Revolution on the interaction between the county’s linguistic distance from Mandarin (based on the primary language spoken in the county), and the strength of radio signal locally. For our estimates to be causal, we require that the unobserved differences between Mandarin and non-Mandarin counties with high broadcast signal to be comparable to the unobserved differences between Mandarin and non-Mandarin counties with low broadcast signal, in a counterfactual world absent of radios.

We argue that this assumption is credible. In China, linguistic differences are plausibly exogenous to determinants of revolutionary behavior. China is composed of hundreds of mutually unintelligible spoken dialects united by a common written script. Relative to other modern nation states with the same level of linguistic diversity, linguistic variation in China stems less from ethnic differences. Linguistic differences reflect historical migration patterns and diffusion of groups that are often no longer salient in modern times. The unique intersection of linguistic heterogeneity and ethnic homogeneity lends credibility to the research design.

The results show that radio broadcast induced more conflict only in the areas where Mandarin was relatively well understood. In Mandarin speaking counties, we find that a standard deviation shift in exposure leads to more than a quarter standard deviation shift in percent of population killed. In contrast, the impact of radio in non-Mandarin speaking counties...
locations is a precise zero. Thereby, the extent of exposure and success of indoctrination hinged not only on the broadcast infrastructure but also on the linguistic compatibility of the listeners.

An important question which follows from our first result is the role that ordinary citizens played in inciting violence. Media can cause violence through two channels: by agitating ordinary citizens directly (bottom-up dynamics), or by motivating local bureaucrats to promote more violent tactics (top-down organization). Media can legitimize individual behavior directly by leading citizens to commit violent acts of their own volition upon listening to the ideological messages (Yanagizawa-Drott, 2014). Local bureaucrats or political agents might also escalate violence, in response to media provocation, by coercing the people to act or by increasing recruitment (Rogall, 2014). In other words, the differences in outcomes can reflect either the differential response on the part of the listening public or differential enforcement of policies across locations arising from media. Follow-up work to Yanagizawa-Drott (2014), such as Rogall (2014), has emphasized the latter channel in the Rwandan context.

In our paper, we explore the role of bottom-up dynamics. To do this, we examine within-county variation in a complementary outcome pertinent to the Cultural Revolution: participation in the Send Down Movement. The Send Down Movement entailed a program of rustication in which youths were sent down to the countryside to be reeducated alongside farmers. This movement was partly compulsory and enforced through the local government, but partly voluntary as well. By utilizing individual variation within small localities — that is to say, by controlling for county fixed effects — we control for the regional differences in enforcement, thus isolating the individual component of participation. We consider participation in the Send Down Movement as a proxy for revolutionary behavior, since it belongs to the bundle of actions endorsed by the state during the course of the Cultural Revolution (Zhou, 2004). The data we use comes from the China Family Panel Studies (CFPS) survey, where we observe individual decisions to join the Send Down Movement, as well as the dialect spoken at home.

More specifically, to identify the individual component of participation, we exploit a natural experiment generated by the differential receptiveness to media by Mandarin speakers of different birth cohorts during this time period. The identification framework involves a difference-in-differences strategy in which we focus on cohorts who lived through the Cultural Revolution during their youth. We compare the difference in participation between Mandarin speakers and non-Mandarin speakers of that cohort with other cohorts in small geographic cells, where the dimension of media access due to radio signal would be similar. We find

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4The inclusion of location fixed effects removes the variation in radio exposure due to differences in radio signal.
that individuals aged 10 to 21 at the start of the Cultural Revolution who understood Mandarin were more likely to participate in the Send Down Movement than their non-Mandarin speaking peers and Mandarin speakers from other cohorts. We interpret this as capturing the differential exposure to propaganda by the Mandarin speakers of this particular cohort. By isolating within county variation, we provide evidence that one channel through which media operates is through direct persuasion of individuals.

Another feature of our setting is that we can distinguish direct exposure through personal media or propaganda consumption (proxied by individual Mandarin comprehension) from indirect exposure through interaction with peers (proxied by residing in a predominantly Mandarin speaking county). We find a positive and significant interaction between the two channels, which is consistent with the existence of social interactions or local complementarities. This sheds light on how individual behavior translates into collective action.

Lastly, we move beyond contemporaneous outcomes to examine the long-term consequences of exposure to propaganda on behavior. The previous literature has found that living through Communist regimes has a lasting effect on individual beliefs (Alesina and Fuchs-Schündeln, 2007).\textsuperscript{5} We attempt to provide one explanation for why this occurs. In general, studies have found that political communication rarely has long term effects.\textsuperscript{6} However, specific evidence on the persistence of propaganda itself is elusive. The political continuity in the Chinese context presents a unique opportunity to study this question. China has not experienced a regime change since the founding of the People’s Republic of China, and the party responsible for the Cultural Revolution-era propaganda remains in control.\textsuperscript{7} Hence, we are able to examine whether propaganda is effective at cultivating a more permanent support of the government.

We consider Communist Party membership in later life as an outcome. Joining the Communist Party is a competitive process where self initiated applicants are screened based on ideological rigor.\textsuperscript{8} Utilizing the same econometric framework as before, we find that Mandarin speakers who were of the impressionable age cohort during the Cultural Revolution were more likely to join the Communist Party later in life. The evidence suggests that media facilitated the recruitment and supply of party members.

This paper relates to several distinct strands of literature. It complements recent work

\textsuperscript{5}Similarly, Voigtländer and Voth (2015) show Nazi indoctrination had persistent effect on fostering anti-Semitism in Germany.

\textsuperscript{6}The half life of political advertisement in a US political campaigns is merely one week (Hill et al., 2013).

\textsuperscript{7}The post-Mao shift in party policy and leadership did not result in the outright repudiation of Mao and his policies. With the exception of the prosecution of the Gang of Four, public admission of the failure of Mao-era policies were understated. It stands to reason that 1950s propaganda would still be consequential for the current regime.

\textsuperscript{8}See background section.
exploring the political effects of media. DellaVigna and Kaplan (2007), Gerber et al. (2009),
and Chiang and Knight (2011) investigate media influence on voting behavior in developed
democracies. Enikolopov et al. (2011) and DellaVigna et al. (2014) show effects of media on
voting behavior in transitional democracies, namely Russia and Croatia. Adena et al. (2015)
attribute the rise of Nazi support partially to the influence of radio propaganda. Less is
known regarding the impact of media in non-democracies. Notably, Yanagizawa-Drott (2014)
find that radio broadcasts encouraging violence during the Rwandan genocide increased
militia violence. Qin et al. (2017) describe governmental control of media in contemporary
China and Qin et al. (2018) study whether market competition constrained the extent of
media bias in the same setting.

We contribute to this literature by exploring the effect of propaganda in a novel context —
the Cultural Revolution, which is substantially distinct from those found in existing studies.
Prior papers have shown the capacity of media to exploit pre-existing ethnic cleavages and
instigate violence exclusively along that dimension. Our paper illustrates the ability of the
state to carry out mass violence through media that is unrelated to ethnic dispositions.

Our unique institutional setting also allow us to devise a novel identification strategy
based on the variation in spoken vernacular. We show that linguistic compatibility was cru-
cial for the success of indoctrination. The results suggest that the effectiveness of persuasion
can be highly heterogenous and depend crucially on the identity of the audience. This paper
increases understanding of the characteristics that might make individuals more persuadable
and more receptive to media effects.

In addition, by showing that individual responses vary with exposure to media in an envi-
ronment where bureaucratic enforcement is uniform, we provide evidence that one mechanism
through which media affects behavior is through the bottom-up dynamics of individual per-
suasion. In addition, we investigate the long run consequences of exposure to state-sponsored
media, which is relatively unexplored in the prior literature. Our setting is particularly well
suited to answer this question, since the political environment is relatively stable over the
time period we study.

This paper also contributes to the literature on how linguistic diversity shapes economic
and political outcomes. Linguistic fractionalization is a barrier to state capacity, hinder-
ing the government’s ability to implement policy. Outcomes due to this limitation on state
capacity are found to have an unfavorable impact on the country. Numerous studies have
attributed political instability, poor institutions, and low economic growth to ethnolinguistic
fragmentation. For instance, Easterly and Levine (1997) find that GDP growth is inversely
related to fractionalization across a large sample of countries. La Porta et al. (1999) show
fractionalization is important in determining the quality of government. Alesina and La Fer-
The rara (2000) document that participation in social activities is lower in more ethnically or racially fragmented localities in the United States. More recently, Michalopoulos (2012) and Bazzi et al. (2017) explore the causes and consequences of ethnolinguistic diversity in the setting of developing countries.

We provide a clear mechanism to the limits of centralization when there is linguistic fragmentation using intra-country evidence. During the Cultural Revolution in China, linguistic differences precluded the state from carrying out its goals by constraining the audience of state sponsored media, thereby limiting the scope of persuasion. This provides new evidence that promoting linguistic homogeneity through standardization of language augments state capacity, broadly conceived.

Finally, our paper adds to the growing empirical literature on the Chinese Cultural Revolution. These studies have typically focused on the outcomes for areas and the cohorts who experienced it (Bai, 2014; Gong et al., 2014, 2015; Kinnan et al., 2015; Meng and Gregory, 2007; Zhou, 2013). There is relatively little work studying the local determinants of the Cultural Revolution. To our knowledge, we are the first to provide rigorous empirical evidence on the cause of the violence, as well as the motivating factors compelling individuals to be voluntarily rusticated. By showing that media influences ideology and individual behavior during the Cultural Revolution, our study also complements two recent studies about the determinants of ideology (Cantoni et al., 2017) and foreign media uptake (Chen and Yang, 2017) in China today.

The rest of the paper proceeds as follows: Section 2 provides a brief history of radio broadcasting in China and the Cultural Revolution, Section 3 describes our data, and Section 4 explains the contemporaneous effects of media on violence during the Cultural Revolution. An analysis of mechanisms and the persistence of ideology is presented in Section 5. Concluding remarks are offered in Section 6.

Meng and Gregory (2007) find that those whose education was disrupted during this time period faced a decrease in lifetime earnings. Within this literature, special attention is paid to the impact of the Send Down Movement specifically. 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 the Send Down Movement on beliefs, 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. Kinnan et al. (2015) finds the effects of lasting inter-province links created by migration due to the Send Down Movement.
2 Background

It is beyond the scope of our paper to provide an extensive background of the events of the Cultural Revolution. Instead, in this section we will focus on the particular details that are relevant for our analysis of the relationship between radio propaganda and individual behavior. We document that the Communist government undertook a campaign to mobilize the public into action during this time period. The media, and especially radio, were particularly salient ways to communicate with the masses and facilitate the transmission of state ideology.

The Cultural Revolution was a large-scale political campaign launched by Mao Zedong in 1966 with a purported intent to “cleanse the class ranks of bourgeois elements”\textsuperscript{10}. The violence of the Cultural Revolution was pervasive and widespread, especially during the first two years, from 1966 to 1968. Even though much of the writing concerning violence during the Cultural Revolution focuses on urban violence, more recent work has documented the extent of violence in the rural areas (Walder and Su, 2003). 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.\textsuperscript{11} The violence and political purges during the Cultural Revolution were typically perpetrated by ordinary individuals within a radicalized community rather than agents of the central government. Oftentimes, the perpetrators and victims knew each other.

The nature of the violence was primitive. Instead of guns and armed weaponry, victims were often beaten to death with blunt objects, or forced to jump off cliffs. The perpetrators of violence were not deemed as criminals, but rather, were accepted as someone who was acting on behalf of the community. These communities were “willing” agents of the central government (Su, 2011).

State apparatuses such as the police and the military were largely paralyzed. Legitimacy during the Cultural Revolution grew from association with Mao. Hitherto, Red Guards, a revolutionary youth organization composed of ordinary civilians, became the paramilitary force of the movement. According to varying sources, between 200,000 and 1.5 million were

\textsuperscript{10}The Cultural Revolution was born out of factional competition 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. As a result, Mao launched the campaign in order to purge his political enemies and regain effective decision making.

\textsuperscript{11}The land-owning class and the educated were targeted in this punitive campaign. Even though land had already been redistributed in the earlier movements, individuals who formerly owned land were nevertheless targeted.
killed during the Cultural Revolution, and many more were victims of persecution (Walder and Su, 2003).

The Cultural Revolution required mass involvement and compliance at many levels of the public. Because the movement was principally initiated by Mao to re-assert control over the party, it did not have consensus support within the government itself, particularly provincially. To implement the movement, Mao bypassed traditional party structures and appealed directly to the masses. Popular consent and participation constituted the instrument of *de facto* political power. Radio became the means through which the overwhelming mass response was realized.

Throughout the Cultural Revolution, radio allowed for the direct communication between Beijing and the local communities. Radio broadcasts served the dual purpose of communicating Mao’s directions and goals as well as inciting the masses to action and to carry out these goals. State rhetoric heightened the revolutionary fervor among ordinary civilians who were otherwise tangentially connected to the political process. In the next few sections, we provide an overview of the buildup of radio infrastructure in the years leading up to the Cultural Revolution, the content of the broadcasts, and constraints on its effectiveness.

### 2.1 Broadcasting Infrastructure in Communist China

The official use of radio by the Communist Party of China (CPC) dates from September 1945, when it established a radio station within the CPC controlled territory in Ya’an. Following political consolidation in 1949, the regime nationalized existing private stations and developed an extensive network of mass communication that was centrally operated. Detailed instructions regarding its administration and establishment were given in April 1950, when “Decisions Regarding the Establishment of Radio-Receiving Networks” was announced (Pye, 2015).

Similar to the organization of the broadcasting network in the Soviet Union at the time, the Chinese government organized its broadcasting network at three distinct operational levels: central, regional, and local, each of which corresponded to their respective geographic units and political authority. The central tier referred to the Central People’s Broadcasting Station, or Radio Beijing. It created programming: in particular national and international news, and dictated policy. Radio transmission from the central station was relayed wirelessly, first to municipal or provincial radio stations, before being re-directed to radio-receiving stations located at each county seat. The local radio stations had to rebroadcast content created by the Central People’s Broadcasting Station, and could only add local news content (Liu, 1971).
From the county radio station, wires that carry the broadcasts were extended to the rural villages in its jurisdiction and connected to strategically-situated loudspeakers. Typical locations included floors of manufacturing plants, poles in market places, roofs of government buildings, communes, and dormitories. These public places were chosen for their visibility to facilitate collective listening. The overall engineering schematic is illustrated in Figure 1. Strictly speaking, this was not a broadcasting system, but a system of point-to-point radio communication, with dissemination of selected programming at points of reception through means of wired loudspeakers. This system and its predecessors were known as “radio diffusion exchanges” in the Soviet Union (Houn, 1957).

The construction of these exchanges circumvented the lack of ordinary radio equipment. By 1956, there were reportedly only 1,500,000 radio receiver sets capable of receiving programs from medium wave stations nationally, including those that were controlled and operated by the government (Jan, 1967). Because personal receiver sets were costly to manufacture and private ownership was scarce, collective listening via public loudspeakers constituted the bulk of radio reception through the 1950s and 1960s. Wired loudspeakers were more economical to build en masse, and also allowed the Communist government to completely regulate listening habits. Per governmental figures, the total cost for building a new radio diffusion exchange, together with 150 wired speakers, was about 7,000 yuan and monthly expenses for operating such exchanges did not exceed 90 yuan. In comparison, the cost of 150 regular radios was more than 20,000 yuan and their monthly maintenance was estimated at 1,500 to 2,000 yuan (Jan, 1967).

In the decade immediately prior to the Cultural Revolution, there was an extensive buildup in the stock of this broadcasting infrastructure. The Third National Radio Broadcasting Conference, held in December 1955, announced a schedule to build more than 1,169 wired radio broadcasting stations in 1956 with 781,942 loudspeakers attached, 80% of which would be installed in villages, starting from a baseline of 107 rural receiving stations and 56 provincial or municipal stations. This conference projected that by the end of 1957 there would be more than 1,800 wired radio broadcasting stations with more than 1,360,000 loudspeakers in villages. The collectivization campaigns and introduction of communes during the Great Leap Forward facilitated the extension of broadcasting into rural areas. This initiative had dramatic local consequences. Loudspeakers were installed in peasants’ homes and commune offices. According to government sources at the time, by 1963, 95% of all counties had access to loudspeaker facilities, although this number may have been inflated (Jan, 1967).

Sustained radio operation required a consistent source of electrical power. The expansion in equipment was accompanied by an increase in the electrical power dedicated to broadcast-
ing. The combined strength of the stations in 1952 rose to 475.2 kilowatts; in 1954 the figure was more than nine times that of 1952. In 1957, total kilowatts had increased by 470% from 1954. However, by the mid 1960s, widespread electrification still eluded significant portions of China. Large power plants were concentrated in coastal locations and regions of Manchuria which were formerly occupied by the Japanese. This was despite the call for the installation of large hydro and thermal plants in Beijing’s first Five Year Plan, initiated in 1956. The actuality of the electrification campaign consisted of crude generating plants of every conceivable method: small hydro motors, hand generators, gas motors, wind motors, etc. (Liu, 1964).

Consequently, radio development was confined to areas where the power supply was relatively sufficient. This pattern of provincial and municipal radio stations is supported 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.\(^{12}\)

Nevertheless, on the eve of the Cultural Revolution in 1964, there was a robust system of radio communication in China, consisting of 141 provincial and municipal stations (including the central station in Beijing), 1,975 rural receiving stations, and approximately 6 million loudspeakers across the country, amounting to 1 loudspeaker per every 160 persons (Latham, 2007; Liu, 1964). Radio was an invaluable tool for state transmissions and projected national authority directly to its intended recipients.

### 2.2 Radio Content and Propaganda

From the outset, broadcasting infrastructure in China was designed expressly for the purpose of mass persuasion. The political leaders were keenly aware of mass media as an instrument for state indoctrination and for the transmission of ideology. Virtually all senior members of the party were actively involved in media and propaganda activities at some point in their careers (Volland, 2003). The alacrity with which Chinese government developed its network of state sponsored media following its establishment in 1949 was proclaimed by contemporary Western sources as the “most extensive propaganda effort” in history (Howse, 1960). Both scholars writing in the midst of the Cultural Revolution and researchers writing retrospectively have noted the pervasiveness of politicized rhetoric and have contemplated its role in facilitating the events (Howse, 1960; Jan, 1967; Markham and Liu, 1969).

\(^{12}\)However, the invention of the transistor allowed the development of battery-powered loudspeaker systems, obviating the need for electricity for loudspeaker systems (Cook, 2014).
Initially, radio broadcasting was used in adjunct to the press. Due to persistent illiteracy, the growth in the number and circulation of newspapers from 1952 to 1959 was modest. Despite a sustained plan to eradicate illiteracy, the literacy rate remained at only around 30% among those in the age group of 14 to 40, and substantially lower for older cohorts. Peasants who had become literate often lapsed back into illiteracy after the conclusion of compulsory education. Additionally, due to the varied and oftentimes physically inaccessible terrain, the medium of radio proved a particularly effective channel of persuasion and state communication.

The content of radio programming was highly integrated to national policy and focused public attention to immediate goals of the state. During the Cultural Revolution, political propaganda actively promoted the demagoguery of Mao and emphasized Maoist thought over any semblance of orthodox Marxism. The dominant style of broadcasting focused on mass agitation and the coverage of mass campaigns with the goal of arousing support and increasing mobilization. This was especially pronounced from the onset of the Cultural Revolution.

Propaganda constituted a significant portion of the content over the airwaves. On average, radio broadcasts in 1964 would last 435 minutes per day, consisting of program announcements (5%), educational programs (16%), newscasts (29%), weather (2%), agricultural programs (7%), and entertainment (41%) (Jan, 1967).

Newscasts consisted of broadcasts from the Central People’s Broadcasting Station, the official party station, and included programs such as “Quotations from Chairman Mao,” “Selected Reading of Chairman Mao’s Works,” and leaders’ speeches (Jan, 1967). Some examples of quotes from Mao’s Little Red Book include: “A revolution is not a dinner party, or writing an essay, or painting a picture, or doing embroidery; it cannot be so refined, so leisurely and gentle, so temperate, kind, courteous, restrained and magnanimous. A revolution is an insurrection, an act of violence by which one class overthrows another.” This serves as an example of the types of behavior sanctioned and even promoted during the Cultural Revolution. The chief function of news broadcasts was to discredit Mao’s enemies, and they were almost exclusively devoted to sensational exposés of those who were purged.

Entertainment included revolutionary songs and dances, aimed at political agitation. All traditional or foreign cultural influences, including music and opera, were purged, leaving only party propaganda. The media propagandized the “literature of workers and peasants” over high culture. The Communist Party demanded programs be “nationalistic and populistic” not “intellectual and foreign” (Liu, 1964).

Agricultural programming consisted of half technical advice and half propaganda, which included speeches from model farmers. In total, propaganda and indoctrination constituted
85% of broadcast time. These radio broadcasts encouraged listeners to participate in the revolutionary cause to build a greater China together (Latham, 2007).

To enforce compulsory listening, a system of collective listening was adopted in villages and communes. This was implemented in two ways: broadcasting assemblies and institutional listening. In the former, heterogeneous audiences of peasants were gathered together in “radio auditoriums” and listened to designated programs in groups, commonly monitored by party cadres. In the latter, loudspeakers broadcast for a set number of hours each day in public places such as governmental offices, factories, and schools, where employees, workers, and students were captive audience members. In the lead up to the Cultural Revolution, the practices of institutional listening became greatly promoted. A report from Shanghai dated August 9th, 1966, the day after Radio Beijing had broadcast the Central Committee’s decision on the Cultural Revolution, stated:

The broad revolutionary people enthusiastically listened to the broadcast of the Central Committee’s decision last night. Early this morning, parade columns appeared in major streets of Shanghai... The commune members in the suburbs, who were busy in reaping and planting, listened to the broadcast and were greatly excited (Liu, 1971).

Throughout the Cultural Revolution, radio would remain the direct communication link between the central government and the people, bypassing the interference of local political power and bureaucrats. Local stations were forced to rebroadcast programs from the Central People’s Broadcasting Station, and only had power to create local news content. In fact, whenever a purge within a given regional party occurred, the radio stations in that region stopped broadcasting regional content entirely and only broadcast news from Radio Beijing.

The radical politicization of media content in this time period created a favorable climate of opinion for the Cultural Revolution: it heightened the morale of Mao’s followers and identified the ideological enemies, whether perceived or real. Exposure to radio increased the impression of universality of the political struggle, induced otherwise apathetic peasants to become state agents, and emboldened them to act.

2.3 Language Standardization and Policy

Despite the pervasive infrastructure of the radio network across China, the comprehension of the messages were constrained. The uniformity of content in the broadcasts were also reflected in the uniformity of the broadcast language.

In an attempt to combat localism, it was mandated that all official news broadcasts 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, 1971). 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, 1971).

China is a linguistically diverse nation, within which the predominant language is Chinese, or 

*Hanyu*. 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. 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. There is a general consensus of a North and South division with more pronounced variation in the rugged South.

The choice of a Mandarin-language broadcast in counties where it was not understood should not be considered an oblivious oversight by a non-optimizing bureaucrat. Rather, it was a calculated decision reflecting the careful tradeoff between the static efficiency of persuasion and the dynamic efficiency of linguistic standardization. A unified language was thought to be instrumental in unified policy for a unified country. Before the ascendance of the Communist Party in 1949, there was no national standard language. 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. However, by 1955, the government had become highly cognizant of linguistic barriers to national construction. In a little publicized Conference on Standardization of Chinese Language in 1956, a simplified version of Standard Mandarin was devised and

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13 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.

14 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.

15 A common governmental language existed in the form of Guanhua during the dynastic periods but it was used only by the upper echelons of bureaucrats and magistrates (Ramsey, 1987).

16 In the early days of the Cultural Revolution and during the rise of the Communist Party, language standardization had nothing to do with Communism. In addition, in this period, 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, Mandarin comprehension was a matter of location, not of education.
promoted as the common tongue.\textsuperscript{17}

This language policy was implemented through a variety of mechanisms including laws, regulations, education, exams, and restriction of minority language use in public spaces (Barnes, 1982). In 1956, primary school teachers were trained in the standard language and the use of minority dialects in schools or over the airwaves was rebuked. Even the primacy of propaganda was subordinate to the directory of language standardization.

\section{Data}

Our aggregate analysis makes use of a number of datasets, including: (i) revolutionary intensity at the county level, proxied by number of deaths, from Walder and Su (2003), (ii) the predicted strength of radio signal received at each county seat, (iii) the extent of Mandarin intelligibility locally, and (iv) information on county characteristics from historical censuses and gazetteers. The rest of this section describes each of these in detail.

\subsection{Cultural Revolution Intensity}

The main outcome of interest is the intensity of the Cultural Revolution. On the county level, this is proxied by the number of killings due to revolutionary violence. Our analysis uses a county-level dataset on revolution-related fatalities and victims, digitized from regional gazetteers (Walder and Su, 2003). To the best of our knowledge, this is the most comprehensive dataset of casualties available.

Gazetteers are book-length encyclopedias detailing local histories, demographics, and economics. Gazetteers covering the Cultural Revolution were published in the late-1980s as a consequence of a central policy directive issued in 1978. Each county was instructed to conduct official investigations into the period in order to rehabilitate “wrongful” victims and compensate remaining family members (Su, 2011).\textsuperscript{18} Although the resulting annals contained varying degrees of details, they all included specifics on the number of abnormal deaths attributable to the revolution.

For instance, these deaths include suicides of individuals under persecution, deaths in clashes with military or factions, deaths in struggle sessions or as a result of imprisonment, and executions during political campaigns. Walder and Su (2003) collected this information

\textsuperscript{17}The National Language Unification Commission established the Beijing dialect of Mandarin as the standard language of the country in 1932. For expediency, the People’s Republic retained this standard when they took power in 1949. However, active enforcement and promotion only began from 1956 onward.

\textsuperscript{18}National standards were established with much room for interpretation. Some of the annals were very lengthy and detailed, including details on the method of killing, while others were brief and conservative.
along with the number of victims in each county, more loosely defined. The authors discuss
the issue of data quality extensively. They conclude that the degree of under-reporting in
the data should not be correlated with the severity of the Cultural Revolution locally.

Figure 2 illustrates the spatial variation in revolutionary intensity for the entire sample.
The average percent killed in a county is 0.048%, with a standard deviation of 0.164. As
noted in previous work, considerable variation in revolutionary intensity exists (Su, 2011;
Walder and Su, 2003).

3.2 Radio Signal

We construct a measure of radio reception using information on the location of provincial and
municipal radio stations. This data is obtained from Liu (1971), who identified the location
of 141 known provincial and municipal stations in 1964, just prior to the Cultural Revolution.
Based on this cross sectional data, we apply the Irregular Terrain Model (Hufford, 2002) to
calculate the predicted radio signal strength in all localities.

The Irregular Terrain Model (ITM) was originally developed by the US government
for frequency-planning purposes and allows one to accurately predict signal strength across
narrow geographical cells (Phillips et al., 2011). The model computes the signal loss between
transmitting and receiving locations, accounting for the physical distance and topography
that lies in between. It has also been employed by Olken (2009), Enikolopov et al. (2011), and
DellaVigna et al. (2014). To implement the ITM algorithm, we utilize information on radio
station locations along with a high resolution geo-topographical map of China. For each
county, we predict the radio signal strength at the county seat, where historically the county
receiving radio stations would have been located. Ultimately, we compute our explanatory
variable, $Signal_c$, by dividing the signal intensity by its standard deviation.

To account for potential endogeneity in the location of radio stations, we follow Olken
(2009) and simulate the hypothetical signal quality in free space (i.e., assuming that the
terrain is flat and absent of any geomorphological obstacles). Figure 3 displays the geographic
variation in actual and hypothetical signal strength. Conditional on the “free space” signal,
which captures the variation in signal strength driven by proximity to transmitters, the
coefficient on $Signal_c$ is identified only by the residual variation in propagation patterns
caused by idiosyncratic topography features, which is plausibly exogenous.

Although this assumption is fundamentally untestable, we provide indirect evidence of
conditional independence by examining the correlation of radio coverage with local condi-
tions that can determine participation in violence. The correlates we consider are: total
population, population density, industrialization, gender ratio, township administrative clas-
sification, linguistic fragmentation, and historical development (as measured by the number of Buddhist temples constructed prior to 1920).

Table 2 shows the relationship between signal strength and these county characteristics controlling for the “free space” signal. $Signal_c$ is not significantly correlated with most of the local socio-economic characteristics prior to the Cultural Revolution (with the notable exception of the county’s administrative designation). This provides evidence that, at least based on observables, controlling for the “free space” signal alleviates much of the concerns of selection with respect to radio station location. In fact, our main empirical strategy will relax this identification assumption even further, through using the spatial variation in dialects spoken. We discuss this more in the Empirical Strategy and Results section.

### 3.3 Linguistic Data

Another source of identifying variation is generated by differences in regional vernacular dialects and heterogeneity in their compatibility with Standard 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 if present, and the dialect families they belong to.\[19\]

Second, to measure each dialect’s linguistic distance to Mandarin, we appeal to experimental data collected by linguists in the field. Tang and Van Heuven (2009) study 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.\[20\] These participants were also selected

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19 Although the majority of the languages are spoken by those of Han ethnicity, in our robustness section we restrict our attention to linguistic diversity within the 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 the possible confounding bias of ethnicity.

20 Therefore, their intelligibility scores would closely reflect intelligibility of youths during the time period we are interested in.
because they had never traveled outside of their home province. From this experiment a measure of bilateral intelligibility between dialects was compiled. A reproduction of their findings is shown in Figure A1. From this chart, we focus on the row “Beijing,” which represents the ability of listeners of each dialect to correctly identify words from the Beijing Mandarin dialect, which closely resembles Standard Mandarin.

We construct our analytical dataset by combining the spatial data on the dialects spoken by county and the proximity of each of these dialects to the Mandarin family and Standard Mandarin. Since only 15 dialects were studied instead of the entirety of Chinese dialects, we use each of these dialects as the representative of the family of dialects that they originate from. We standardize these comprehension measures by subtracting the percent understood of one’s native dialect. Figure 4 maps the geographical variation of the underlying data.

### 3.4 Control Data

We complement the above dependent and explanatory variables with additional sources of control data, which we briefly outline here. The socio-economic and demographics information come from the 1964 Census, which was the last census enumeration prior to the Cultural Revolution. This data is obtained from the University of Michigan’s China Data Center. We also use the China Historical GIS (CHGIS) digital map collection of Harvard University. Using the maps, we compute the proximity to nearest navigable river and distance to the coast from the centroid of each county as well as the number of historical Buddhist temples contained in each county. Data on county-level railroad access as of 1961 is created from rail network files provided by Baum-Snow et al. (2017). Ruggedness and terrain feature data are constructed as per instructions from Nunn and Puga (2012). Table 1 shows the summary statistics of select explanatory and dependent variables.

### 4 Empirical Strategy & Results

In this section, we examine whether radio propaganda affected the contemporaneous intensity of the Chinese Cultural Revolution. The outcome we study is the number of killings directly attributable to the Cultural Revolution. Our empirical strategy is motivated by the institutional features of the historical episode, where the quality of broadcast signal and the local people’s comprehension of Mandarin jointly determined the strength of exposure. We define the treatment as the interaction of signal strength with linguistic distance from Mandarin. Equation 1 describes the main specification:
\[ y_c = \beta \text{Mandarin}_c \cdot \text{Signal}_c + \alpha \text{Signal}_c + \sigma \text{Mandarin}_c + \delta \text{Free Signal}_c + \gamma \mathbf{X}_c + \lambda_p + \epsilon_c, \] (1)

\text{Signal}_c is the predicted signal strength in county \( c \), \( \text{Mandarin}_c \) is the mutual intelligibility of the local dialect in county \( c \) with Mandarin, \( \mathbf{X}_c \) is a vector of county characteristics and \( \lambda_p \) is a province fixed effect. The outcome, \( y_c \), is the casualty rate directly attributed to the events of the Cultural Revolution in county \( c \). The coefficient of interest is \( \beta \), which measures the effect of the interaction of language with radio reception.

In practice, the \( \text{Mandarin}_c \) variable is constructed in two ways. First, we define an indicator variable for if the main local dialect in county \( c \) belongs to the Mandarin language group. Second, we use a continuous measure of linguistic distance, \( \text{Experimental Intelligibility}_c \). This is the percentage of the 288 core Mandarin words correctly identified in a listening exam, by a sample of 150 speakers of the dialect in county \( c \).\(^1\) The continuous intelligibility measure, which utilizes more variation than a binary Mandarin indicator, addresses concerns that our results are driven by fundamental differences between Mandarin and non-Mandarin counties.

The baseline controls, \( \mathbf{X}_c \), contain a set of local socio-economic characteristics just prior to the Cultural Revolution. This includes: county population in 1964, the share of agricultural population, gender ratio, number of households, and railroad access in 1962; historical controls such as the number of Buddhist temples within the county, an index of ethnolinguistic fractionalization; as well as robust set of geographic controls, such as the ruggedness of the terrain, river and waterway access, county area, latitude and longitude, distance to provincial capitals, and distance to Beijing. Importantly, to account for unobservable characteristics that could vary systematically with proximity to radio stations, we include the free space signal strength \( \text{Free Signal}_c \).

Formally, the econometric framework relies on the interaction between the two sources of variation, \( \text{Signal}_c \) and \( \text{Mandarin}_c \), and the interaction is to be interpreted as plausibly exogenous. Thus, the key identifying assumption is that the interaction term between \( \text{Mandarin}_c \) and \( \text{Signal}_c \) is orthogonal to other determinants of violence. The parameter \( \beta \) reflects the relative difference in the level of violence between Mandarin and non-Mandarin counties with the same radio coverage. The interpretation is similar in spirit to a generalized difference-in-differences setup, but exploits comparisons across space rather than time. Analogously, identification requires that the unobserved differences between Mandarin counties.

\( ^1 \)The \( \text{Experimental Intelligibility} \) measure is created from data collected in Tang and Van Heuven (2009), discussed in detail in Section 3.3.
and non-Mandarin counties with high broadcast signal to be comparable to the unobserved differences between Mandarin and non-Mandarin counties with low broadcast signal in a counterfactual world in the absence of radios.

This assumption would be violated if radio stations were installed more densely 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 on the part of Communist regime. Furthermore, as discussed in the background section, radio station construction was largely governed by technological, and specifically energy, constraints. Because rural electrification in China is overwhelmingly based on hydropower, it is plausible that controlling for river and waterway access subsumes much of the variation.

4.1 Baseline Results

We present our results in Table 3. To start, we first report estimates from an un-interacted model in column (1) and show the effect of signal strength on conflict per se. This is a more standard media-effect model where the coefficient of interest is the direct effect of signal strength alone. This allows us to compare our results to those found in the existing literature. For reference, the specification is as follows:

\[ y_c = \beta_{\text{Signal}} + \delta_{\text{Free Signal}} + \sigma_{\text{Mandarin}} + \gamma X_c + \lambda_p + \epsilon_c, \]  

(2)

Here, linguistic distance to Mandarin appears in the specification only as a control. Identification therefore relies exclusively on the conditional exogeneity of the \( \text{Signal}_c \) term. That is to say: by controlling for free space signal, \( \beta \) is identified only by the difference between actual and hypothetical signal strength within the county, which is driven by idiosyncratic features of the terrain and hence may be interpreted causally.

The estimated effect of radio reception is statistically significant and quantitatively important. The standardized beta coefficients imply that a one standard deviation increase in signal strength is associated with a nearly a tenth of a standard deviation shift in the dependent variable. These figures are broadly comparable, though smaller in magnitude, with the findings of Yanagizawa-Drott (2014).

Next, we turn to the fully-interacted model as defined in Equation (1), which combines two sources of identifying variation: both radio signal and linguistic distance from Mandarin, which relaxes the identifying assumptions further. Controlling for only the free space signal in column (2), we find a significant and positive coefficient of .023 on the interaction term. The effect is meaningful as the average percent killed per county is 0.048 percent. The main effect of radio signal is weakly negative and insignificant.
In the next two columns, we successively introduce more controls. In column (3) we include the geographic variables: latitude and longitude, railroad access, ruggedness, river and coastal access, area size, distance to major cities, and distance to Beijing. Finally, we add controls for pre-existing socioeconomic conditions in column (4). This includes: the number of historical Buddhist temples, 1964 county population, 1964 county gender ratio, 1964 fraction of non-agricultural population, the number of households in 1964, and the ethnolinguistic fragmentation. This is our preferred specification.

The baseline controls improve the explanatory power of the econometric model. Whereas the point estimate on the interaction term remains statistically significant and similar in magnitude to the coefficient on signal strength in column (1), the main effect of signal alone is now zero to 3 decimal places (with an estimated standard error a little under 0.009). This implies that radio broadcast was effective in inducing more conflict only in Mandarin speaking counties. By contrast, the effect is absent in locations where the Mandarin was not understood. Hence, the effect of radio in the un-interacted specification is driven by the impact of radio in counties that spoke Mandarin.

In last four columns of Table 3, we replicate the analogous results using Experimental Intelligibility as a continuous measure of intelligibility of Mandarin. One might think that Mandarin speakers are somehow systematically different and have different unobservables from non-Mandarin speakers. This analysis mitigates those concerns by allowing us to utilize linguistic variation within the Mandarin and non-Mandarin groups.

We start our analysis with only province fixed effects and a free space signal control (column 5), then add the baseline controls (columns 6 and 7). The effect of radio signal is increasing in the linguistic distance to Mandarin. Counties with strong signal reception where the local dialect was mutually intelligible with Mandarin experienced a greater degree of violence. The estimates are robust to inclusion of various controls.

Thereby, our identification strategy pinpoints the population for whom radio reception mattered. Our results suggest that the effectiveness of broadcasts was constrained by local linguistic compatibility.

4.2 Robustness

To assess robustness of the results, we conduct the following checks: (i.) alternative definitions of the dependent and independent variables; (ii.) omitting outliers (iii.) clustering at different geographic units; (iv.) using different subsamples (omitting areas with a high percentage of ethnic minorities); and (v.) successively including additional controls that
correspond to additional determinants of violence.\textsuperscript{22}

\textit{Alternative Variable and Sample Definitions}

Table 4 shows that our results do not depend on the variable or sample definition. First, in columns (1) - (2), we perform our baseline analysis using the number of people killed in each county as the outcome, rather than the fraction of population killed. In columns (3) - (4), we consider the fraction of the population who are persecuted as opposed to killed (this information comes from the same Walder and Su (2003) data).

We explore robustness of our results to using a signal threshold as well, in columns (5) and (6), since previous studies emphasized the non-linear relationship between signal strength and quality of broadcasts. We define our explanatory variable as a binary indicator for if the strength of signal in the county is above the median.\textsuperscript{23}

Finally, in columns (7) - (8), we explore whether our results are robust to excluding outliers. Specifically, we omit counties in the highest 1\% of casualty rate. Overall, the results using alternative variables and samples are qualitatively similar to the original specification.

\textit{Clustering}

In our main specification, we clustered our standard errors at the level of dialect group. In Table 5, we show robustness to different specifications of clustering. To accommodate other types of unobserved correlation between observations across other geographic boundaries, we cluster standard errors at the nearest the radio station level (columns 1 and 2), at the dialect level (columns 3 and 4), at the radio-dialect group level (columns 5 and 6). We also use Conley standard errors with a 150km cutoff for spatial autocorrelation (columns 7 and 8). The results remain robust.

\textit{Subsamples}

One potential concern is that our estimates are driven by targeted violence towards ethnic minorities in peripheral or autonomous provinces. This would mean that our results could be confounded by the effect of ethnic-based conflict. To address this, we restrict our attention to what is traditionally referred to as China “proper” and areas that are uniformly ethnically Chinese.

Contemporary China consists of 23 provinces and 5 autonomous regions. By restricting samples to only the territories within the Great Wall, or China “proper,” we demonstrate that our results are stable across sub-populations (see Table 6). First, we exclude the Northwestern provinces (Gansu, Qinghai, Ningxia, Xizang (Tibet), and Xinjiang), second the Southwestern provinces (Guangxi and Yunnan), then the Northeastern provinces (Inner Mongolia, Heilongjiang, and Jilin), and finally all of these border provinces, in columns (1),

\textsuperscript{22}In the appendix, we also censor the sample by omitting observations with extreme values.

\textsuperscript{23}Similar threshold-based designs are used in Bursztyn and Cantoni (2016) and Durante et al. (2015).
(2), (3), and (4) respectively. This implies that the effect of radio broadcasts on violence is not explained by a story of the core versus periphery parts of China, or by the ethnic-based violence that may have occurred during the Cultural Revolution.

Additional Covariates

We make further progress towards improving the validity of our research design by controlling for additional variables. Drawing on the growing literature on determinants of violence, we include controls to address selection and potential competing stories explicitly. Our choice of additional controls is guided by the determinants of violence that have been emphasized in the literature.

The robustness results are shown in Table 7. Column (1) of Panels A and B refers to our baseline specification. In the subsequent columns we successively add more controls. In column (2) for Panel A and B, we interact each of our baseline controls with Mandarin and Experimental Intelligibility respectively.

A credible threat to identification is correlation between Mandarin and other controls that affect violence in high radio penetration areas, since identification in our setting draws from the interaction of radio coverage and linguistic distance. The inclusion of interacted controls allows for the effect of any control we include to vary by the language of the county. As a result the variation captured by $\beta$, the parameter of interest on the explanatory variable, is not conflated with the differential impact of observed controls across language groups.

To account for unobservable differences across regions and among the radio towers, we add fixed effects for the nearest radio station in column (3). In column (4), we control for crop suitability of the local soil (this includes suitability of grain, wheat, rice, and millet). This is motivated by the literature on the relationship between crop suitability and long-run economic development, which finds that initial economic conditions can affect the onset of violence.\footnote{Crop suitability is an index created by the Global Agro-Ecological Zones (GAEZ) model developed by the Food and Agriculture Organization. http://www.fao.org/land-water/en/}

In column (5) we include controls for historical development variables: 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.

We also include covariates on the incidences of historical conflict in column (6), given the persistence in conflict and culture that is documented in the literature. We control for conflict during the Taiping and Boxer Rebellion as well as number of revolutionaries in the
initial Republican revolution.\textsuperscript{25}

The coefficient stays consistent and significant across all specifications. This alleviates concerns regarding our empirical strategy.

4.3 Persuasion Magnitudes

In order to contextualize our estimates, we compute the persuasion coefficient following DellaVigna and Gentzkow (2010). The persuasion coefficient measures the fraction of the population exposed to persuasive messages (but who otherwise are not predisposed to violence) who are persuaded to kill:

$$f = \frac{\text{percentkilled}_t - \text{percentkilled}_c}{\text{exposure}_t - \text{exposure}_c} \cdot \frac{1}{1 - y_0} \cdot 100$$

$y_0$ is the counterfactual behavior in the absence of treatment. We calculate the effect of moving from a non-Mandarin speaking county (control) to a Mandarin speaking county (treatment), controlling for the existence of radio. Thus, a proxy for $y_0$ is the average percent killed in a non-Mandarin speaking county. We define $\text{exposure}_t$ as the percent of Mandarin speakers in a Mandarin speaking county, and $\text{exposure}_c$ as the percent of Mandarin speakers in a non-Mandarin speaking county.\textsuperscript{26} The $\text{percentkilled}$ values are from our estimated coefficients. The persuasion rate is:

$$f = \frac{0.00018 + 0.00021 - 0}{0.25 - 0.6} \cdot \frac{1}{1 - 0.0006164} \cdot 100 = 0.205\%$$

The persuasion rate implies that radio messages induced 0.205\% of individuals, not otherwise predisposed to violence, to commit killings. Though this percentage point estimate is small compared to other measures of persuasion in the literature, which span from 1\% to 20\%, killing is a much more extreme behavior than, for example, voting. Hence, we believe that our estimate is reasonable. In addition, given the number of people exposed, even a small realized persuasion rate is consequential in explaining the level of violence, especially given that homicide rate in China is typically low.

\textsuperscript{25}The Taiping and Boxer Rebellion variables are dummies equal to one in counties affected by the Taiping Rebellion, and where the Boxer operated and killed foreigners, respectively. The revolutionaries in the initial Republican revolution is a count variable. The data on historical development and conflict come from Bai and Jia (2016).

\textsuperscript{26}We measure these exposure values using the China Family Panel Studies dataset (described in section 5.1), where we have data on both Mandarin speakers and Mandarin counties.
5 Individual-Level Results

Thus far, we have provided evidence that the violence of the Cultural Revolution was higher in Mandarin-speaking areas with stronger radio signal. This result aligns with the previous literature that demonstrates the effects of media on individual behavior. An important, but relatively unexplored question that follows is the mechanism through which increased violence can occur. The existing literature has emphasized two potential channels through which media can induce conflict: by inciting ordinary citizens directly (bottom-up dynamics), or by motivating local bureaucrats to promote more violent tactics (top-down organization). Individuals can act of their own volition upon hearing ideological messages, or local bureaucrats might escalate violence by coercing the people to act. In our paper, using micro-data from the China Family Panel Studies (CFPS) survey, we find evidence that one channel through which media operates is through inducing differential individual participation, even when local enforcement is presumably constant. In addition, we also explore the long-term consequences of exposure to propaganda.

5.1 Individual Variation and the Send Down Movement

In this section, we utilize within-county variation to study one potential mechanism through which media affected individual behavior. We consider a complementary outcome pertinent to the period: participation in the Send Down Movement. In contrast to the violence, which had implications for both urban and rural areas, the Send Down Movement, also known as the Rustication Movement, was primarily an urban event. It was a program in which 17 million urban youths were “sent down” to the rural countryside to work alongside peasants in order to learn from them. Although rural rustication was framed as a necessary reeducation, it served a dual purpose to defuse violence and lower unemployment in the cities. It was organized in late 1968 in response to the escalating violence in cities with the intent to de-mobilize the Red Guards in an ideologically expedient fashion.

The movement was partly compulsory and enforced through the local government, but partly voluntary as well. At face value, it would not seem highly desirable to be sent far away from home to perform manual labor. However, Mao depicted this movement as a patriotic event, so former Red Guards and other youth volunteered to be rusticated. Red Guards were disproportionately likely to participate, possibly out of their own volition or selective targeting. Many were also forcibly sent down to the countryside. In total, around 15% of individuals who were sent down volunteered because of a genuine belief in the revolutionary agenda (Pan, 2003).

According to an interview from a former individual who was sent-down, “It was like a
group outing because we were sent down with our friends—all of our good friends and classmates from the same class at the same school so I thought it would be fun...it was just in popular political fashion for you to leave” (Rene, 2013). We examine if voluntary participation can be attributed to ideological manipulation through state-sponsored media.

A key feature of our data which allows us to determine the direct effect of media on individuals is that we are able to utilize within-county variation. This allows us to control for the regional differences in enforcement and isolate the individual component of participation. Our identification strategy involves a difference-in-differences framework in which the two sources of variation are living through the Cultural Revolution during one’s youth, and being a native Mandarin speaker. In this framework, any differences between the Mandarin and non-Mandarin speakers for that cohort in excess of the differences from other cohorts is attributed to the effect of propaganda.

5.1.1 Individual-level Data

Individual-level micro-data comes from the China Family Panel Studies (CFPS), a cross sectional and retrospective survey conducted in 2010 by the Institute of Social Science Survey of Peking University in China. It collected 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 from selected counties across China. After dropping observations with relevant missing data we are left with 13,350 observations.

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

- “Have you had any of the following life experiences?” Choices include the “Send-Down” experience, referred to as send 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

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27 Differences in individual response can arise due to differential sensitivity to pressure from authorities, or differential disposition toward revolutionary ideas. We do not attempt to distinguish between the two.

28 We are unable to perform the same specification in the previous section, which uses signal strength as an additional source of variation, because the nature of the data is coded. We cannot observe the actual identities of the counties.
to a Chinese local dialect or minority ethnic dialect. This variable is referred to as Mandarin. Summary statistics are shown in Table 8.

5.1.2 Empirical Strategy

We use two key sources of variation to investigate the effect of propaganda on individual revolutionary behavior. The first is being a native Mandarin speaker, since this affects comprehension of the radio broadcasts. We use a dummy for speaking Mandarin at home as a proxy for being a native Mandarin speaker, and argue that this variable is exogenous and is not a choice variable. Being a native Mandarin speaker depends on one’s parents as well as location of birth. We also note that this may not be a perfect measure of Mandarin comprehension, since individuals could choose to learn Mandarin even though they do not speak it at home. However, if this were the case, our results would be attenuated. The ideal data would distinguish those who comprehended Mandarin from those who did not during the Cultural Revolution. If there are individuals who speak Mandarin, and thus comprehend the language, but are not native speakers, this would attenuate the results because they would be grouped into the non-native speakers, but still have understood the radio messages.

The second source of variation is individual age at the start of the Cultural Revolution. Evidence from the psychology literature suggests that adolescents and youths are more susceptible to media than those of other age groups. The Cultural Revolution itself also suggests that adolescents might be the most influenced by propaganda during this time period. The Communist Party specifically targeted youth to join the revolutionary cause, and most Red Guards were between 12 and 17 years old (Jing, 1991). For these reasons, we consider individuals aged 10 to 21 at the start of the Cultural Revolution, born between 1945 and 1956, as the cohorts differentially exposed to the Cultural Revolution rhetoric. This definition incorporates both the historical details as well as evidence from psychology literature outlining the most impressionable years. We explore the robustness of our empirical results to different definitions of these age categories later in the section.

29 The impressionable years hypothesis states that the historical environment to which one is exposed 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 permanent. 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 constitute 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.

30 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 naivety (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).
Thus, we explore the effects of understanding Mandarin among the cohorts for whom propaganda was the most salient. We note that although we do not measure media directly as an explanatory variable, we believe that media is the most likely explanation for the measured effect. We control for signal strength flexibly with a set of county fixed effects, leaving language as the sole remaining source of variation in media exposure. The difference-in-differences regression we estimate is as follows:

$$y_{ijc} = \alpha_{\text{Mandarin}_i} + \gamma_{\text{CR cohort}_j} + \delta_{\text{CR cohort}_j \cdot \text{Mandarin}_i} + \omega_c + X_i \beta + \epsilon_{ijc}$$ (3)

In the equation above, $y_{ijc}$ denotes the participation in the Send Down Movement of individual $i$ of cohort $j$ born in county $c$. The independent variable, $\text{CR cohort}_j$, is a dummy for being age 10 to 21 at the start of the Cultural Revolution, and $\text{Mandarin}_i$ is a dummy for speaking Mandarin at home. $\omega_c$ is a county fixed effect which partials out the difference in outcome arising from radio infrastructure or local political conditions. The parameter of interest is $\delta$, the coefficient on the interaction term, which measures the effect of speaking Mandarin for the Cultural Revolution cohort.

In our preferred specification, $X_i$ is a vector of individual level controls, which include 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. These factors may determine Send Down Movement participation and be correlated with language use at home. Additional interacted controls include interactions between CR Cohort and education, gender, urban dummy, birth province, and ethnicity. This allows the control variables to affect Send Down Movement participation differently for the CR cohort.

For instance, we control for parental demographics and characteristics because children of parents targeted by the Communist Party for belonging to “bad class backgrounds” may have been more likely to be sent down—either of their own volition to prove their loyalty to the Communist Party—or through coercion. While radio signal does not explicitly appear in the estimation equations, by utilizing within county variation, we allow for radio signal to vary flexibly across localities.

We also estimate a non-parametric event study model by using 5-year birth cohort dummies instead of specifying a treated cohort, because the definition of the impressionable age can vary. This lets data “tell the story.” It also allow us to assess the validity of our research design by visualizing the “pre-trend” and examine if differential behavior between Mandarin and non-Mandarin speakers was unique to the Cultural Revolution cohort. We estimate the
following fully flexible regression specification:

\[ y_{ijc} = \alpha_{\text{Mandarin}_i} + \sum_j \gamma_j \text{cohort}_j + \sum_j \delta_j \text{cohort}_j \cdot \text{Mandarin}_i + \omega_c + X_i \beta + \epsilon_i \]  

(4)

The independent variables, \text{cohort}_j, are a set of dummies for the birth cohorts that individuals belonged to. The cohort categories are defined by the age at the start of the Cultural Revolution: 30 and older, 25 to 30, 20 to 25, 15 to 20, 15 to 10, 10 to 5, and 5 to 0 in 1966. The controls are the same as Equation 3, except instead of interacting the \text{CR cohort} with individual controls, \text{cohort}_j is interacted. The estimated vectors \( \delta_j \), the set of coefficients on the interaction term between \text{cohort}_j and \text{Mandarin}_i, reveal the effect of speaking Mandarin at home on participation in the Send Down Movement for individuals belonging to each birth cohort. If, for example, the Cultural Revolution propaganda increased participation then we would expect \( \delta_j \) to be positive and significant only for the birth cohorts 10 to 5 and 15 to 10.

5.1.3 Results

The first two columns of Table 9 present the results of estimating Equation 3. 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 participation in the Send Down Movement. The coefficients of interest are the coefficients of \( \text{CR Cohort} \times \text{Mandarin} \). The second column includes the full set of interactions between the CR Cohort indicator and education, gender, urban dummy, birth province, and ethnicity.

Belonging to the CR Cohort while speaking Mandarin at home leads to a 5.8 percentage point increase in likelihood of joining the Send Down Movement, compared to a baseline value of 1.4 percent probability of participation.\(^{31}\) To interpret this number in the aggregate, we simulate a situation in which the interaction of \( \text{CR Cohort} \) and \( \text{Mandarin} \) is zero, in our data. This simulates a situation in which radio broadcasts were not available or understood. We compare the aggregate participation rates predicted by our model, between the observed treatment effect and the counterfactual treatment effect. We find that in the absence of radio broadcasts, holding all else fixed, a 10.4% decrease in participation in the Send Down Movement would result. In other words, 10.4% of participants were persuaded by media to participate in the Send Down Movement. This number we calculate from the data is comparable to the 15% voluntary participation rate cited in the narrative literature.

\(^{31}\)The effect size is large compared to the mean likelihood. The mean of the treatment variable is also small, at 0.04.
The patterns in the data can also be visualized by plotting the coefficients of the interaction terms from the flexible specification. We display the set of coefficients $\delta_j$ in relation to $\gamma_j$ from Equation 4 in Figure 5. The points plotted here are the level effects for Mandarin speakers and non-Mandarin speakers joining the Send Down Movement.

Outside of the Cultural Revolution cohort, Mandarin speakers and non-Mandarin speakers join the Send Down Movement at approximately the same rate. This indicates that Mandarin speakers were not different from non-Mandarin speakers, except during the time period of the Cultural Revolution, when Mandarin-language propaganda was pervasive.

The point estimates and their associated standard errors are shown in Table A3. In addition, Figure 6 is an analogous figure that plots the difference between Mandarin speakers and non-Mandarin speakers, and the associated standard errors.

Our results highlight one mechanism through which propaganda operates. By exploring within-county variation, we show evidence that Mandarin speakers of the Cultural Revolution Cohort, who could better comprehend radio propaganda, complied more with state policy than their otherwise similar, non-Mandarin speaking neighbors. This suggests that media influenced revolutionary behavior even controlling for the local political atmosphere or bureaucratic enforcement. Hence, our estimates capture the direct effect of radio exposure as opposed to any intermediating effect from changes in the local environment possibly brought about by radio exposure.

We argue that competing stories are implausible for several reasons. First, we address the potential of differential schooling driving our results. We control both for education background of the parents as well as the respondents themselves. Therefore, our results are not conflating any differential schooling that may exist between Mandarin and non-Mandarin speakers.

Second, we address concerns that our results are driven by the selection of Mandarin speakers being different from non-Mandarin speakers. We demonstrate evidence for the parallel trends assumption in Figure 5. The differences in participation in the Send Down Movement between Mandarin and non-Mandarin speakers is small prior to the start of the Cultural Revolution. If participation differed systematically with respect to being a native Mandarin speaker, then we would observe a difference in participation even for non-Cultural Revolution cohorts. This leads us to believe that radio exposure is the mechanism that underlies our findings.


5.2 Social Multipliers

The analysis above describes the effect of media on atomistic behavior of individuals, but it leaves unexplored the role of contagion or diffusion in the realization of collective action. Decision making among peers is frequently not disjointed but inherently linked. The hypothesis that social influence provides an intermediate channel for political persuasion on behavior dates back to Lazarsfeld et al. (1944) and Katz and Paul (1955).

In this section, we test for the presence of social interactions. In particular, we study whether or not there exists positive spillover effects in propaganda exposure. Evidence which would be consistent with spillover effects include increasing returns to revolutionary behavior if one’s peers are also participating. This would mean that there are strategic complementarities to political action, and the effect of media may be amplified in areas where more people are able to comprehend.

One feature of our setting is that we can distinguish direct exposure through personal media consumption (proxied by individual Mandarin comprehension) from indirect exposure through interaction with peers (proxied by living in a predominantly Mandarin speaking county). This allows us to estimate the effect of the interaction of speaking Mandarin at home with residing in a primarily Mandarin speaking county, on participation in the Send Down Movement. We find a positive and significant spillover effect, which is consistent with greater local government enforcement in Mandarin speaking areas, as well as a social multiplier effect. The effect of media is amplified in areas where more people are able to comprehend. The regression specification we run, restricted to members of the CR cohort, is as follows:

\[
y_{ic} = \alpha \text{Mandarin speaker}_i + \gamma \text{Mandarin county}_c + \delta \text{Mandarin speaker}_i \times \text{Mandarin county}_c + X_i \beta + \rho_p + \epsilon_{ic}\]

The left hand side variable, \(y\), is an indicator for having participated in the Send Down Movement. The coefficient \(\delta\) of the interaction term between Mandarin county and Mandarin speaker shows how living in a Mandarin speaking county and speaking Mandarin at home interact to affect the outcome of interest. \(X_i\) is a vector of individual level controls, which is the same as before. Here, we include province fixed effects instead of county fixed effects.

The results are shown in column (2) of Table 10. The coefficient on the interaction of Mandarin speaker \(\times\) Mandarin county represents the effect of speaking Mandarin and living in a Mandarin-speaking county on participation in the Send Down Movement. The
coefficient indicates a 7.2 percentage point increase in likelihood in joining the Send Down Movement if one spoke Mandarin and lived in a Mandarin speaking county, above the effect of either of the two factors alone for members of the CR Cohort. In column (1), we show the analogous results using a triple interaction and the full sample.

The results provide evidence that social interactions effects are non-trivial. The spillover effect from simply living in a Mandarin speaking county is positive while the coefficient on just speaking Mandarin in a non-Mandarin county is close to null. This suggests the effect of individual radio comprehension is driven by radio as a coordination device. Common or community level beliefs affect individual responses.

The multiplier effect is consistent with the historical setting of the Send Down Movement, where volunteering was a very public way to demonstrate one’s loyalty to the Communist Party. Individuals were also more likely to volunteer if their friends volunteered as well. Other examples of social multiplier in the literature include peer effects on university grades (Sacerdote, 2001), crime (Glaeser et al., 1996), and returns to education (Acemoglu and Angrist, 2000).

5.3 Effects on Party Membership

In this section, we move beyond contemporaneous outcomes, to examine the long-term effects of media on individual behavior. Living in a Communist regime has been found to have a persistent effect on preferences and attitudes (Alesina and Fuchs-Schündeln, 2007). Our paper provides context for this persistence by studying the effect of media exposure at a critical age juncture. We consider Communist Party membership as a proxy for ideological behavior. Joining the Communist Party is a rigorous process which involves a lengthy application process and scrutiny. Membership to the Communist Party is exclusive, consisting of 5% of the population. Individuals must submit multiple applications and endure several rounds of evaluations.\(^{32}\) The results here contributes to a strand of literature that tries to understand the determinants of Communist Party membership.\(^{33}\)

We measure Communist Party membership through the following question in the CFPS questionnaire:

- “Are you a member of the Communist Party of China?” We refer to joining the Communist Party within 45 years of birth as *Communist*.\(^{34}\)


\(^{33}\)See Appleton et al. (2009) for a comprehensive literature review

\(^{34}\)We exclude joining the Communist Party after this age because we focus on ideological motivation from one’s youth. The motivations to join in older age is less plausibly a result of this. Only 5% of individuals join after 45.
Using the same difference-in-differences strategy as in Section 5.1, we find that Mandarin speakers who were of the impressionable age cohort during the Cultural Revolution were more likely to be members of the Communist Party. The estimates of Equation 3, for Communist membership outcome, are shown in the last two columns of Table 9.

As with before, we control for family and individual characteristics that can determine party status and are possibly correlated with language use. These include parental occupation, parental party affiliation, education, class status, birth cohorts, hukou and urban status, etc. In the second column, we also interact the controls with the CR cohort dummy.

We find that individuals who speak Mandarin and belong to the Cultural Revolution Cohort are 6.0 percentage points more likely to have joined the Communist Party, compared to a baseline 7.1 percent mean probability of joining the party. The mean year of joining the party for the impressionable CR cohort is 1979. We note that 19% of those who participated in the Send Down Movement also joined the Communist Party. Performing the same counterfactual as with the Send Down Movement, we simulate a situation in which the treatment effect, the interaction of CR Cohort and Mandarin, is zero. We find that in the absence of treatment, the rate of participation in the Communist Party would be 7.0% lower, among those in the Cultural Revolution Cohort. This suggests that 7.0% of party members born between 1944 and 1956 joined the Communist Party under the influence of media.

In the appendix, we use binned birth cohorts to flexibly plot out the trends for joining the Communist Party for Mandarin speakers and non-Mandarin speakers over time. We display the set of coefficients $\delta_j$ in relation to $\gamma_j$ from Equation 4 in Figure A1. The Cultural Revolution Cohort is highlighted between the two vertical red lines. We find that for cohorts outside of the Cultural Revolution period, there is no significant difference in Communist Party membership between Mandarin speakers and non-Mandarin speakers. We also perform a falsification test, shown in Appendix Table A4. 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 3. The birth cohorts are 0-9, 10-21 (Cultural Revolution Cohort), 22-32, 33+, and born after the Cultural Revolution. These birth cohorts are constructed to be roughly the same length of time as the Cultural Revolution Cohort. This lends credibility to the research design and suggests that the differential outcomes of Mandarin speakers belonging to the CR cohort is driven by exposure to Mandarin-language propaganda at a critical age juncture.
6 Conclusion

The difficulty associated with projecting state influence across space is a recurring theme in the setting of developing nations. To this end, mass communication technologies are frequently invoked as instruments which potentially augment state capacity. In this paper, we study how mass media enabled civilian participation and compliance in the context of political campaigns directed by the Communist Party in China.

We utilize a previously unexplored institutional detail of a widely studied historical movement, the Chinese Cultural Revolution, to study the causal impact of state-sponsored propaganda on individual and collective behavior during and after the time period. Our identification is based on the interaction of the geographic variation in radio access and variation arising from the degree of intelligibility between the local dialects and the language used in broadcasts.

Contemporaneously, we find that state radio broadcasts had positive and significant effects on the incidences of conflict during the Cultural Revolution. Localities where both radios were readily available and Mandarin was reasonably well understood experienced a greater intensity of conflict as proxied by the number of individuals killed and total persecuted victims.

The results suggest that linguistic diversity constrained the state’s ability to conduct persuasion, highlighting an important tension faced by the state between standardization of policy and effective administration. This provides a context for why linguistic standardization is often an implicit or explicit policy of the nation building strategy pursued by the state.

We then investigate the mechanisms through which media mobilized participation in conflict and revolutionary behavior. Through studying the Send Down Movement, we provide evidence that one channel through which propaganda operated was through a bottom-up process, driven by a differential response by individuals who were exposed. This is in contrast to the channel of differential coercion, or top-down enforcement on the part of local elites or bureaucrats. The media provided a channel through which the central government could influence individual action directly instead of relying solely on the enforcement of local bureaucrats. This suggests that media can resolve agency problems inherent in the implementation of central policy.

Our unique historical setting also allows us to examine the persistence of ideology. In contrast to insights from the political communication literature, we find that radio propaganda had enduring long term consequences through the recruitment of Communist Party members. Individuals who both were able to understand and were more exposed to the radio
messages were significantly more likely to gain membership to the Communist Party later in life. This suggest that exposure to propaganda at critical junctures in life has long-lasting implications for life-trajectories and choices.

Our paper sheds light on the role of propaganda in building state capacity in both the short and long-run. In the short-term, authoritarian regimes utilize media for the successful implementation of mass campaigns that would be otherwise difficult to coordinate. In the long-run, media cultivates permanent support for the regime through the supply of future party members. The ability of propaganda to influence individual behavior contemporaneously as well as through time is central to the administrative capacity of authoritarian governments.

References


7 Tables

Table 1: Summary statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Killed per County</td>
<td>1985</td>
<td>.048</td>
<td>.164</td>
</tr>
<tr>
<td>Signal</td>
<td>1985</td>
<td>-.455</td>
<td>.979</td>
</tr>
<tr>
<td>Mandarin</td>
<td>1985</td>
<td>.666</td>
<td>.472</td>
</tr>
<tr>
<td>Signal Free</td>
<td>1985</td>
<td>3.548</td>
<td>.981</td>
</tr>
<tr>
<td>Distance from Beijing</td>
<td>1985</td>
<td>1201.898</td>
<td>649.694</td>
</tr>
<tr>
<td>Altitude</td>
<td>1985</td>
<td>.345</td>
<td>.428</td>
</tr>
<tr>
<td>Area</td>
<td>1985</td>
<td>3566.197</td>
<td>8725.911</td>
</tr>
<tr>
<td>Population</td>
<td>1985</td>
<td>310695.8</td>
<td>287279.8</td>
</tr>
<tr>
<td>River Dummy</td>
<td>1985</td>
<td>.455</td>
<td>.498</td>
</tr>
<tr>
<td>Coast Dummy</td>
<td>1985</td>
<td>.12</td>
<td>.326</td>
</tr>
<tr>
<td>Ruggedness</td>
<td>1985</td>
<td>11.398</td>
<td>1.292</td>
</tr>
<tr>
<td>Distance to Closest Provincial Capital</td>
<td>1985</td>
<td>120.973</td>
<td>100.877</td>
</tr>
<tr>
<td>Railroad Access</td>
<td>1985</td>
<td>.325</td>
<td>.469</td>
</tr>
<tr>
<td>Non Agricultural Population</td>
<td>1985</td>
<td>.133</td>
<td>.248</td>
</tr>
<tr>
<td>Male Female Ratio</td>
<td>1985</td>
<td>1.071</td>
<td>.116</td>
</tr>
<tr>
<td>Households</td>
<td>1985</td>
<td>76587.17</td>
<td>64245.61</td>
</tr>
<tr>
<td>Township Dummy</td>
<td>1985</td>
<td>.101</td>
<td>.301</td>
</tr>
<tr>
<td>Linguistic Fractionalization</td>
<td>1985</td>
<td>.038</td>
<td>.139</td>
</tr>
<tr>
<td>Buddhist Temples</td>
<td>1985</td>
<td>1.045</td>
<td>2.361</td>
</tr>
</tbody>
</table>

Note: All distance measurements are in kilometers (km). Area is in square km. Mandarin is an indicator for if the main dialect of a particular county belongs to the Mandarin family of dialects.

Table 2: Correlates of Signal Strength

<table>
<thead>
<tr>
<th></th>
<th>Log Population</th>
<th>Log Households</th>
<th>Log Temples</th>
<th>Gender Ratio</th>
<th>Non-agr. Pop share</th>
<th>Linguistic Fragmentation</th>
<th>Admin. Status</th>
<th>Mandarin County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal</td>
<td>0.032</td>
<td>0.032</td>
<td>-0.022</td>
<td>0.009</td>
<td>0.134</td>
<td>0.004</td>
<td>0.031**</td>
<td>-0.003</td>
</tr>
<tr>
<td></td>
<td>(0.041)</td>
<td>(0.040)</td>
<td>(0.034)</td>
<td>(0.006)</td>
<td>(0.147)</td>
<td>(0.008)</td>
<td>(0.015)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.439</td>
<td>0.449</td>
<td>0.148</td>
<td>0.161</td>
<td>0.180</td>
<td>0.079</td>
<td>0.305</td>
<td>0.571</td>
</tr>
</tbody>
</table>

Note: The table presents the coefficient on Signal in the regression of the corresponding correlate (column header) on radio signal (Signal, the predicted signal strength under real conditions), and geographical controls. Each column is a separate regression. Mandarin County is an indicator for if the primary language spoken in a county is Mandarin. The geographic controls are free space, altitude, geographic coordinates, an indicator for river, an indicator for coast, ruggedness, and railroad access. The level of observation is on the county level. Robust standard errors are shown in parentheses. * p < .10, ** p < .05, *** p < .01
Table 3: Media and Intensity of Conflict

<table>
<thead>
<tr>
<th>Specifications:</th>
<th>Dep Var: Percent of Population Killed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Signal</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Signal</td>
<td>0.013**</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
</tr>
<tr>
<td></td>
<td>[0.081]</td>
</tr>
<tr>
<td>Signal × I{Mandarin}</td>
<td>0.023**</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
</tr>
<tr>
<td></td>
<td>[0.142]</td>
</tr>
<tr>
<td>Signal × Exp. intelligibility</td>
<td>-0.023**</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
</tr>
<tr>
<td></td>
<td>[0.142]</td>
</tr>
<tr>
<td>I{Mandarin}</td>
<td>0.015</td>
</tr>
<tr>
<td></td>
<td>(0.011)</td>
</tr>
<tr>
<td>Exp. intelligibility (% of Mandarin words understood)</td>
<td>-0.040</td>
</tr>
<tr>
<td></td>
<td>(0.058)</td>
</tr>
<tr>
<td>Control variables:</td>
<td>Free space signal propagation: X X X X X X</td>
</tr>
<tr>
<td>Geographic controls: X X X X X</td>
<td></td>
</tr>
<tr>
<td>Socioeconomic controls: X - - X - - X</td>
<td></td>
</tr>
<tr>
<td>Province F.E.: X - - X - - X</td>
<td></td>
</tr>
<tr>
<td>Mean of dep. var.</td>
<td>0.048</td>
</tr>
<tr>
<td>R²</td>
<td>0.226</td>
</tr>
</tbody>
</table>

Note: This table illustrates the effect of radio exposure on violence, estimated with three different specifications. A unit of observation is a county in the 1964 census. The dependent variable in each column is the percent of the population killed in each county due to the Cultural Revolution. Signal is the simulated strength of radio signal in 1964 under real topographic conditions. I{Mandarin} is an indicator variable taking a value of one if the primary dialect spoken in a county belongs to the Mandarin family. Exp. Intelligibility is the percentage of Mandarin words correctly identified by a respondents from each dialect group from the listening experiment conducted by Tang and Van Heuven (2009). Column (1) reports the main effects of Signal itself on violence. Columns (2)-(4) & (5)-(7) report the coefficients obtained from the estimation of equation 1 using I{Mandarin} and Exp. Intelligibility as measures of linguistic distance respectively. The “free space” control refers to the hypothetical radio signal in the absence of geomorphological obstacles; geographic controls include ruggedness of the terrain, river and coastal access, area, treaty port status, distance to major cities, distance to Beijing; and socioeconomic controls include historical Buddhist temples, 1964 population, 1964 gender ratio, 1964 fraction of non agricultural population, number of households, railroad access, and ethnolinguistic fragmentation. Robust standard errors are in parentheses. Selected beta coefficients are in square brackets and report the standard deviation change in the dependent variable resulting from a one standard deviation increase in the explanatory variable. * p < .10, ** p < .05, *** p < .01
Table 4: Alternative Definitions & Excluding Outliers

<table>
<thead>
<tr>
<th>Sample:</th>
<th>Dep Var:</th>
<th>Number of Deaths</th>
<th>% of pop. Persecuted</th>
<th>% of pop. Killed</th>
<th>% of pop. Killed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Full</td>
<td>Full</td>
<td>Full</td>
<td>Omit 1% Outliers</td>
</tr>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
</tr>
<tr>
<td>Signal × 1{Mandarin}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>89.23**</td>
<td>0.038*</td>
<td>-0.038</td>
<td>0.014**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(32.20)</td>
<td>(0.022)</td>
<td>(0.006)</td>
<td></td>
</tr>
<tr>
<td>Signal × Experimental Intelligibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-393.7**</td>
<td>0.292*</td>
<td>-0.292</td>
<td>0.043**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(149.5)</td>
<td>(0.164)</td>
<td>(0.022)</td>
<td></td>
</tr>
<tr>
<td>Signal</td>
<td></td>
<td>-62.507*</td>
<td>-0.040*</td>
<td>-0.135</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(35.272)</td>
<td>(0.017)</td>
<td>(0.112)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>1{Signal} × 1{Mandarin}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1{Signal} × Experimental Intelligibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.043**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.022)</td>
</tr>
<tr>
<td>1{Signal}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.030</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.017)</td>
</tr>
<tr>
<td>1{Mandarin}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.011)</td>
</tr>
<tr>
<td>Experimental Intelligibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-300.151***</td>
<td>-0.015</td>
<td>-0.092</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(115.197)</td>
<td>(0.013)</td>
<td>(0.068)</td>
<td>(0.042)</td>
</tr>
<tr>
<td>Baseline controls:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td>0.327</td>
<td>0.323</td>
<td>0.190</td>
<td>0.210</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.190)</td>
<td>(0.210)</td>
<td>(0.048)</td>
<td>(0.047)</td>
</tr>
<tr>
<td>Mean of dep. var</td>
<td></td>
<td>107.771</td>
<td>106.041</td>
<td>0.117</td>
<td>0.117</td>
</tr>
</tbody>
</table>

Note: This table explores the robustness of the main findings from Table 3 to alternative constructions of the dependent and independent variable as well as to omitting outliers. In columns (1)-(2) the outcome is defined as the number of people killed in a county rather than percent of the population killed. In columns (3)-(4) the outcome variable is the percent of county population persecuted rather than killed. In columns (5) - (6) the explanatory variable is an indicator variable which equals one if the predicted signal strength in a county is greater than the median. Finally, columns (7) - (8) replicate columns (4) and (7) from Table 3 but omit observations in the highest percentile of Cultural Revolution mortality. All specifications include the full set of baseline controls: hypothetical signal strength in the absence of geomorphological obstacles (free space signal); ruggedness of the terrain, river and coastal access, area, treaty port status, distance to major cities, distance to Beijing (geographic controls); railroad access, historical Buddhist temples, 1964 population, 1964 gender ratio, 1964 fraction of non agricultural population, number of households, and ethnolinguistic fragmentation (socioeconomic controls); and a province fixed effect. Robust errors are are shown in parentheses. * p < .10, ** p < .05, *** p < .01
Table 5: Clustering at Different Geographic Units

<table>
<thead>
<tr>
<th>Specifications:</th>
<th>Cluster at nearest station</th>
<th>Cluster at dialect</th>
<th>Cluster at station &amp; dialect w/ 150km cutoff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dep Var: Percent of Population Killed</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Signal × I{Mandarin}</td>
<td>0.018** (0.009)</td>
<td>0.018* (0.010)</td>
<td>0.018* (0.010)</td>
</tr>
<tr>
<td>Signal × Experimental Intelligibility</td>
<td>– 0.057* (0.034)</td>
<td>– 0.057 (0.036)</td>
<td>– 0.057 (0.038)</td>
</tr>
<tr>
<td>Clusters</td>
<td>114</td>
<td>114</td>
<td>102</td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.228</td>
<td>0.226</td>
<td>0.228</td>
</tr>
</tbody>
</table>

Note: This table reports the impact of radio exposure on percent killed, with standard errors clustered at different geographic levels. In columns (1) and (2), standard errors are clustered at the level of the nearest radio station. Columns (3) and (4) cluster at the dialect level, and columns (5) and (6) are 2-way clustered at the dialect and nearest radio station level. Columns (7) and (8) report the Conley (1999) standard errors, correcting for two-dimensional spatial correlation with a 150km cutoff. All specifications include the full set of baseline controls: hypothetical signal strength under flat terrain (free space signal); ruggedness of the terrain, river and coastal access, area, treaty port status, distance to major cities, distance to Beijing (geographic controls); railroad access, historical Buddhist temples, 1964 population, 1964 gender ratio, 1964 fraction of non agricultural population, number of households, and ethnolinguistic fragmentation (socioeconomic controls); and a province fixed effect. Robust standard errors are shown in parenthesis. * p < .10, ** p < .05, *** p < .01

Table 6: Restricted Samples

<table>
<thead>
<tr>
<th>Sample excludes:</th>
<th>Northwest Provinces</th>
<th>Southwest Provinces</th>
<th>Northeast Provinces</th>
<th>All border Provinces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dep Var: Percent of Population Killed</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Signal × I{Mandarin}</td>
<td>0.017** (0.008)</td>
<td>0.016* (0.009)</td>
<td>0.019*** (0.007)</td>
<td>0.015* (0.009)</td>
</tr>
<tr>
<td>Signal × Experimental Intelligibility</td>
<td>– 0.066** (0.031)</td>
<td>– 0.082** (0.037)</td>
<td>– 0.060** (0.025)</td>
<td>– 0.081** (0.039)</td>
</tr>
<tr>
<td>Signal</td>
<td>-0.000 (0.010)</td>
<td>0.014 (0.009)</td>
<td>-0.004 (0.009)</td>
<td>0.001 (0.009)</td>
</tr>
<tr>
<td>I{Mandarin}</td>
<td>0.020* (0.011)</td>
<td>– 0.011 (0.009)</td>
<td>– 0.021** (0.011)</td>
<td>– 0.014 (0.013)</td>
</tr>
<tr>
<td>Experimental Intelligibility</td>
<td>– -0.002 (0.069)</td>
<td>– 0.015 (0.042)</td>
<td>– 0.014 (0.058)</td>
<td>– -0.051 (0.116)</td>
</tr>
<tr>
<td>Observations</td>
<td>1792</td>
<td>1776</td>
<td>1627</td>
<td>1615</td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.015</td>
<td>0.194</td>
<td>0.199</td>
<td>0.223</td>
</tr>
</tbody>
</table>

Note: This table reports results for geographically restricted samples. Columns (1) and (2) exclude Gansu, Qinghai, Ningxia, Xizang (Tibet), and Xinjiang. Columns (3) and (4) exclude Guangxi and Yunnan. Columns (5) and (6) exclude Inner Mongolia, Heilongjiang, and Jilin. Columns (7) and (8) exclude all aforementioned provinces. All specifications include the full set of baseline controls: hypothetical signal strength in the absence of geomorphological obstacles (free space signal); ruggedness of the terrain, river and coastal access, area, treaty port status, distance to major cities, distance to Beijing (geographic controls); railroad access, historical Buddhist temples, 1964 population, 1964 gender ratio, 1964 fraction of non agricultural population, number of households, and ethnolinguistic fragmentation (socioeconomic controls); and a province fixed effect. Robust errors are shown in parentheses. * p < .10, ** p < .05, *** p < .01
### Table 7: Additional Controls

<table>
<thead>
<tr>
<th>Dep Var: Percent of Population Killed</th>
<th>Baseline controls × Mandarin station FE</th>
<th>Agriculture suitability (4)</th>
<th>Historical development (5)</th>
<th>Historical conflict (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel A: Mandarin Dummy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signal × 1 (Mandarin)</td>
<td>0.018** (0.007)</td>
<td>0.019*** (0.008)</td>
<td>0.012 (0.008)</td>
<td>0.016** (0.007)</td>
</tr>
<tr>
<td>Signal</td>
<td>0.000 (0.008)</td>
<td>-0.001 (0.012)</td>
<td>0.001 (0.012)</td>
<td>0.001 (0.009)</td>
</tr>
<tr>
<td>Observations</td>
<td>1985</td>
<td>1985</td>
<td>1338</td>
<td>1338</td>
</tr>
</tbody>
</table>

Panel B: % of Mandarin Words Comprehended

| Signal × Exp. Intelligibility        | 0.057** (0.025)                        | 0.049** (0.029)            | 0.037 (0.029)             | 0.033 (0.025)          |
|                                      | 0.015** (0.007)                        | 0.013* (0.011)             | 0.008 (0.011)             | 0.008 (0.007)          |

Note: This table examines the stability and robustness of the results to inclusion of additional control variables. Panel A corresponds to the specification using Mandarin as an explanatory variable and Panel B corresponds to the specification using Exp. Intelligibility as an explanatory variable. The first column corresponds to the baseline specification from columns (4) and (7) of Table 3. Then in the remaining specifications we add different sets of controls as described in the text. All specifications include the full set of baseline controls as previously described. In column (2), we interact the linguistic distance explanatory variable (Mandarin indicator and Exp. Intelligibility) with the baseline controls. In column (3), we add a fixed effect for the nearest radio station. In column (4), we control for crop suitability of the local soil (this includes suitability of grain, wheat, rice, and millet). In column (5) we include controls for historical development variables: the number of civil service entrants and imperial exam qualifiers. In column (6), we control for conflict during the Taiping and Boxer Rebellion as well as number of revolutionaries in the initial Republican revolution. Robust standard errors are provided in parentheses. * p < .10, ** p < .05, *** p < .01.

### Table 8: Summary statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sent Down</td>
<td>13350</td>
<td>.014</td>
<td>.119</td>
</tr>
<tr>
<td>Communist Party</td>
<td>13350</td>
<td>.071</td>
<td>.256</td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandarin</td>
<td>13350</td>
<td>.145</td>
<td>.353</td>
</tr>
<tr>
<td>CR Cohort</td>
<td>13350</td>
<td>.217</td>
<td>.412</td>
</tr>
<tr>
<td>Education</td>
<td>13350</td>
<td>5.909</td>
<td>4.795</td>
</tr>
<tr>
<td>Age</td>
<td>13350</td>
<td>51.244</td>
<td>12.311</td>
</tr>
<tr>
<td>Gender</td>
<td>13350</td>
<td>.496</td>
<td>.5</td>
</tr>
<tr>
<td>Urban area (Census Bureau’s definition)</td>
<td>13350</td>
<td>.382</td>
<td>.486</td>
</tr>
<tr>
<td>Father’s level of education</td>
<td>13350</td>
<td>1.763</td>
<td>1.014</td>
</tr>
<tr>
<td>Mother’s level of education</td>
<td>13350</td>
<td>1.355</td>
<td>.734</td>
</tr>
</tbody>
</table>

Note: Sent Down and Communist Party are binary variables. Mandarin is an indicator for speaking Mandarin at home. CR Cohort is an indicator for belonging to the Cultural Revolution Cohort, defined as being ages 10-21 in 1966. Education values range from 1 to 22, in increasing levels of education. Gender is percent male.
Table 9: Individual Behavior

<table>
<thead>
<tr>
<th></th>
<th>Send Down Mean value: 0.014</th>
<th>Communist Party Mean value: 0.071</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>CR Cohort x Mandarin</td>
<td>0.043**</td>
<td>0.058**</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.027)</td>
</tr>
<tr>
<td>Mandarin</td>
<td>-0.005</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td>(0.009)</td>
</tr>
<tr>
<td>CR Cohort</td>
<td>0.013***</td>
<td>-0.032</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.115)</td>
</tr>
<tr>
<td>Observations</td>
<td>13350</td>
<td>13350</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.297</td>
<td>0.323</td>
</tr>
<tr>
<td>Additional Interactions</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Note: This table shows the effect of speaking Mandarin and belonging to the Cultural Revolution Cohort on two outcomes: participation in the Send Down Movement (columns 1-2), and joining the Communist Party (columns 3-4). Mandarin is an indicator for speaking Mandarin at home. CR Cohort is an indicator for being age 10 to 21 in 1966. Controls include 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 interaction controls include interactions between CR cohort and education, gender, urban dummy, birth province, 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. Robust standard errors are in parenthesis. * p < .10, ** p < .05, *** p < .01
Table 10: Send Down Movement: Mandarin Speakers in Mandarin Speaking Counties

<table>
<thead>
<tr>
<th>Sample restriction:</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandarin Speaker x Mandarin County x CR Cohort</td>
<td>0.066 (0.042)</td>
<td>–</td>
</tr>
<tr>
<td>Mandarin Speaker x Mandarin County</td>
<td>0.018* (0.010)</td>
<td>0.072* (0.040)</td>
</tr>
</tbody>
</table>

| Sum of coefficients                              | 0.073 (0.041)        |
| p-value                                          |                      |
| Observations                                     | 16487                | 2893                |
| $R^2$                                            | 0.151                | 0.547               |

Note: This table shows the interacted effect of being a Mandarin speaker in a primarily Mandarin-speaking county on participation in the Send Down Movement. In the first column, individuals of all age cohorts are included in a triple interaction specification. The second column restricts the regression to the CR cohort. In the first column, the sum of the coefficients of the triple interaction and Mandarin Speaker x Mandarin County and the associated p-value are presented. The baseline controls include an indicator for Mandarin speaker, indicator for Mandarin-speaking county, an indicator for being part of the CR cohort, and their interactions with CR cohort. Other controls include 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, and interactions between the CR cohort indicator and education, gender, urban dummy, birth province, 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. * $p < .10$, ** $p < .05$, *** $p < .01$. 

8 Figures

Figure 1: Radio Diffusion Exchange

Note: This is a reproduction of a figure in Liu (1964). It shows the overall structure of the radio diffusion exchanges. The dotted lines represent signals sent over the airwaves and solid lines represent wired connections.

Figure 2: Extent of the Violence during the Cultural Revolution

Note: In this figure, more darkly-shaded regions correspond to areas with a higher number of fatalities directly attributed to the Cultural Revolution.
Figure 3: Predicted Radio Signal

(a) Signal Strength

(b) Free Space Signal Strength

Note: The maps represent the geographic distribution of the simulated intensity of radio signal in 1964, under real conditions (top) and in the absence of geomorphological obstacles (bottom). The geographic boundaries of the map of China are dictated by the availability of violence data from Figure 2.
Figure 4: Linguistic Distance to Mandarin

(a) Mandarin Indicator
(b) % of Mandarin Words Understood

Note: The maps present the geographic distribution of linguistic distance to Mandarin as it is operationalized in the paper. The geographic boundaries of the map of China are dictated by the availability of violence data from Figure 2. On the left, the red region indicates areas whose main dialect belongs to the Mandarin family while the white region indicates areas whose main dialect does not belong to the Mandarin family. On the right, redder shades represent a higher fraction of Beijing Mandarin words identified by speakers (of the dialect of vernacular Chinese) in that region, while greener shades represent a smaller fraction identified. The gray regions indicate missing data from the linguistic study, Tang and Van Heuven (2009). We note that there is variation in comprehension of Beijing Mandarin even within the Mandarin family of dialects.

Figure 5: Participation in the Send Down Movement: Mandarin versus Non-Mandarin Speakers

Note: This figure plots regression-adjusted trends in Send Down Movement participation between Mandarin and non-Mandarin speakers. The participation rate for non-Mandarin speakers in 1921 is normalized to 0. The outcome is an indicator variable for participation in the Send Down Movement. 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. Standard errors are shown in Appendix Table A3.
Figure 6: Participation in the Send Down Movement: Difference between Mandarin and Non-Mandarin Speakers

Note: This figure plots the regression coefficients of the birth cohort dummies defined on 5 year intervals interacted with a Mandarin speaking dummy, from the regression of Send Down Movement participation on birth cohorts and individual control variables. This is analogous to Figure 5, but instead of plotting the levels for both Mandarin and non-Mandarin speakers, the difference and associated confidence interval is plotted. The point estimate is represented by the square point and the interval corresponds to the 95% confidence interval. We see that the coefficient on the interaction of Mandarin and birth cohort dummy is only positive and statistically significant for the Cultural Revolution birth cohorts.
Appendix

Table A1: Mandarin Comprehension

Note: This table is from Tang and Van Heuven (2009). Each entry represents the percent of words correctly understood of a particular dialect by a listener of another (or the same) dialect.

Table A2: Robustness: Alternative Samples & Signal Cutoffs

Note: This table replicates the analysis from Table 3 for the different sample specified and alternative definition of treatment definition. In column (1) & (2), we censor the sample by dropping zero death counties and outlier counties (defined as those above the 99th percentile in the outcome variable). In column (3) & (4), we replace extreme values with the 99th percentile value. In the remaining columns, results with different signal thresholds are shown. Results are qualitatively similar. * p < .10, ** p < .05, *** p < .01
Figure A1: Communist Party Membership: Coefficients of Mandarin x Age Cohort

Note: This figure plots regression adjusted trends in Communist Party participation between Mandarin and non-Mandarin speakers. The outcome is a dummy for joining the Communist Party within 45 years of birth. The rate for non Mandarin speakers in 1921 is normalized to 0. 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.
Table A3: Send Down 5-year Estimates

<table>
<thead>
<tr>
<th>Birth cohort × Non-Mandarin speaker</th>
<th>Send Down</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth cohort 1926 × Non-Mandarin speaker</td>
<td>0.000</td>
</tr>
<tr>
<td>Birth cohort 1926 × Mandarin speaker</td>
<td>-0.008</td>
</tr>
<tr>
<td>(0.048)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1931 × Non-Mandarin speaker</td>
<td>0.024</td>
</tr>
<tr>
<td>(0.019)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1931 × Mandarin speaker</td>
<td>0.005</td>
</tr>
<tr>
<td>(0.032)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1936 × Non-Mandarin speaker</td>
<td>-0.007</td>
</tr>
<tr>
<td>(0.018)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1936 × Mandarin speaker</td>
<td>-0.018</td>
</tr>
<tr>
<td>(0.025)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1941 × Non-Mandarin speaker</td>
<td>-0.002</td>
</tr>
<tr>
<td>(0.018)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1941 × Mandarin speaker</td>
<td>-0.002</td>
</tr>
<tr>
<td>(0.023)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1946 × Non-Mandarin speaker</td>
<td>0.006</td>
</tr>
<tr>
<td>(0.018)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1946 × Mandarin speaker</td>
<td>0.019</td>
</tr>
<tr>
<td>(0.018)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1951 × Non-Mandarin speaker</td>
<td>0.016</td>
</tr>
<tr>
<td>(0.018)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1951 × Mandarin speaker</td>
<td>0.071***</td>
</tr>
<tr>
<td>(0.020)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1956 × Non-Mandarin speaker</td>
<td>0.008</td>
</tr>
<tr>
<td>(0.018)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1956 × Mandarin speaker</td>
<td>0.057***</td>
</tr>
<tr>
<td>(0.020)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1961 × Non-Mandarin speaker</td>
<td>-0.017</td>
</tr>
<tr>
<td>(0.018)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1961 × Mandarin speaker</td>
<td>-0.042**</td>
</tr>
<tr>
<td>(0.020)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1966 × Non-Mandarin speaker</td>
<td>-0.015</td>
</tr>
<tr>
<td>(0.018)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1966 × Mandarin speaker</td>
<td>-0.023</td>
</tr>
<tr>
<td>(0.020)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1970 × Non-Mandarin speaker</td>
<td>-0.013</td>
</tr>
<tr>
<td>(0.018)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1970 × Mandarin speaker</td>
<td>-0.018</td>
</tr>
<tr>
<td>(0.020)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1975 × Non-Mandarin speaker</td>
<td>-0.020</td>
</tr>
<tr>
<td>(0.019)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1975 × Mandarin speaker</td>
<td>-0.035*</td>
</tr>
<tr>
<td>(0.020)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1980 × Non-Mandarin speaker</td>
<td>-0.023</td>
</tr>
<tr>
<td>(0.019)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1980 × Mandarin speaker</td>
<td>-0.033</td>
</tr>
<tr>
<td>(0.020)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1986 × Non-Mandarin speaker</td>
<td>-0.025</td>
</tr>
<tr>
<td>(0.019)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1986 × Mandarin speaker</td>
<td>-0.031</td>
</tr>
<tr>
<td>(0.021)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1991 × Non-Mandarin speaker</td>
<td>-0.023</td>
</tr>
<tr>
<td>(0.020)</td>
<td></td>
</tr>
<tr>
<td>Birth cohort 1991 × Mandarin speaker</td>
<td>-0.030</td>
</tr>
<tr>
<td>(0.021)</td>
<td></td>
</tr>
</tbody>
</table>

Observations 16487  
$R^2$ 0.277

Note: This table shows the estimates and standard errors from Figure 5. The participation rate for non Mandarin speakers in 1921 is normalized to 0. The outcome is a dummy for participation in the Send Down Movement. 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. 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 A4: Falsification Test Individual Behavior

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Communist</td>
<td>Sent Down</td>
</tr>
<tr>
<td>Panel A: Born After CR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandarin x Birth Cohort Born After CR</td>
<td>-0.027</td>
<td>-0.034</td>
</tr>
<tr>
<td></td>
<td>(0.071)</td>
<td>(0.023)</td>
</tr>
<tr>
<td>Observations</td>
<td>13350</td>
<td>13350</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.217</td>
<td>0.292</td>
</tr>
<tr>
<td>Panel B: Age 0 to 9 at Start of CR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandarin x Birth Cohort 0-9</td>
<td>0.005</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.008)</td>
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<tr>
<td>Observations</td>
<td>13350</td>
<td>13350</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.218</td>
<td>0.293</td>
</tr>
<tr>
<td>Panel B: Age 10 to 21 at Start of CR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandarin x Birth Cohort 10-21</td>
<td>0.058***</td>
<td>0.043**</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Observations</td>
<td>13350</td>
<td>13350</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.218</td>
<td>0.296</td>
</tr>
<tr>
<td>Panel C: Age 22 to 32 at Start of CR</td>
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<td></td>
</tr>
<tr>
<td>Mandarin x Birth Cohort 22-32</td>
<td>-0.005</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(0.037)</td>
<td>(0.014)</td>
</tr>
<tr>
<td>Observations</td>
<td>13350</td>
<td>13350</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.217</td>
<td>0.293</td>
</tr>
<tr>
<td>Panel D: Age 33+ at Start of CR</td>
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</tr>
<tr>
<td>Mandarin x Birth Cohort 33+</td>
<td>-0.027</td>
<td>-0.034</td>
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<tr>
<td></td>
<td>(0.071)</td>
<td>(0.023)</td>
</tr>
<tr>
<td>Observations</td>
<td>13350</td>
<td>13350</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.217</td>
<td>0.292</td>
</tr>
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Note: Each row represents a different regression estimation of Equation 3 using different age cohorts at the start of the Cultural Revolution, including the 10-21 year old Cultural Revolution Age Cohort. All regressions include province and county fixed effects. Controls include 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. 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. * $p < .10$, ** $p < .05$, *** $p < .01$