

Mass Repression and Political Loyalty: Evidence from Stalin's 'Terror by Hunger'

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States use repression to enforce obedience, but repression – especially if it is violent, massive, and indiscriminate – often incites opposition. Why does repression have such disparate effects? We address this question by studying the political legacy of Stalin's coercive agricultural policy and collective punishment campaign in Ukraine, which led to the death by starvation of over three million people in 1932-34. Using rich micro-level data on eight decades of local political behavior, we find that communities exposed to Stalin's "terror by hunger" behaved more loyally toward Moscow when the regime could credibly threaten retribution in response to opposition. In times when this threat of retribution abated, the famine-ridden communities showed more opposition to Moscow, both short and long-term. Thus, repression can both deter and inflame opposition, depending on the political opportunity structure in which post-repression behavior unfolds.

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Repression is a pervasive feature of politics.¹ The most violent form of repression is one that indiscriminately kills mass populations, or places them in conditions where they die of hunger, exhaustion or disease (Harff and Gurr, 1988; Wheatcroft, 1996). But what do perpetrators of mass repression actually achieve? According to one convention, repression's central purpose is to deter expressions of political disloyalty (Lichbach, 1987). Yet repression often does the opposite – it inflames opposition (Gurr, 1971). What explains this inconsistency in the political legacy of mass repression?

Despite persistent scholarly interest, this question remains unresolved. There is wide consensus that selective repression – which punishes specific individuals for specific actions – can induce obedience without backlash (Lichbach, 1987; Kalyvas, 2006; Blaydes, 2018). Nothing close to such consensus exists on the impact of indiscriminate mass repression.² Using equally plausible theories and empirical designs, past research has argued two seemingly conflicting points: indiscriminate repression induces obedience toward the perpetrator (Lyall, 2009; García-Ponce and Pasquale, 2015; Zhukov and Talibova, 2018; Young, 2018), or repression inflames adversarial sentiments and mobilizes opposition (Kocher, Pepinsky and Kalyvas, 2011; Balcells, 2012; Finkel, 2015; Lupu and Peisakhin, 2017; Rozenas, Schutte and Zhukov, 2017).

Our study helps explain why mass repression can generate both obedience and opposition. Repression's legacy, as we show, is contingent on the political opportunity structure in which future behavior unfolds. Having intimately learned about a regime's resolve in using violence, populations victimized by past repression – or their descendants – will act more obediently, but only if they expect that the regime – or its successor –

¹We define “repression” (or “violence” more generally) as “physical sanctions against an individual or organization [...] for the purpose of imposing a cost on the target as well as deterring specific activities and/or beliefs” (Davenport, 2007). We use the terms “compliance,” “obedience” and “behavioral loyalty” interchangeably to emphasize that observable actions may contradict true preferences.

²Following Kocher, Pepinsky and Kalyvas (2011), we define violence as indiscriminate if perpetrators indiscriminately target *individuals* within groups, even if targeting is selective at the group level. Most cases of mass repression, including the one studied here, fit this description. During the famine, Soviet officials selectively targeted communities that failed to deliver grain quotas, but applied punitive measures collectively to individuals within those communities. For consistency with past literature, we refer to such repression as “indiscriminate.”

is willing and able to punish expressions of disloyalty. Even if past repression inflamed anti-regime sentiments, this threat of retribution can compel victimized populations to “falsify” their preferences and *appear* loyal in order to avoid repression (Kuran, 1995). Conversely, if the regime becomes unable to punish acts of opposition in a consistent and predictable manner, previously suppressed anti-regime sentiments will manifest through voting, street protests or even armed mobilization. In short, local responses to historical repression depend on the permissiveness of political conditions.

To test this argument, we study the impact of the 1932-34 famine in Soviet Ukraine, locally known as Holodomor (“killing by starvation”). Stalin’s coercive agricultural policies and collective punishment campaign deprived entire communities of food, livestock, and freedom of movement in search of survival. The ensuing famine killed over three million people and ranks among the deadliest acts of political terror in history (Snyder, 2010; Applebaum, 2017). The Ukrainian state recognizes the famine as politically motivated genocide, and most Ukrainians share this assessment (Rating Group Ukraine, 2017).

We assess the impact of this historical event on an unusually rich set of political outcomes. Using instrumental variables for local famine lethality and exploiting plausibly exogenous changes in Moscow’s coercive threat in Ukraine, we find heterogeneity in famine’s behavioral effects, short and long term. When Moscow could credibly respond to acts of disloyalty with violence – from the later stages of World War II to the late 1980’s, and again today, in areas recently controlled by pro-Russian separatists – famine-struck communities were more hesitant to express anti-Soviet or anti-Russian views. When Moscow’s retributive threat abated – as in the early stages of WWII, or during and after the Soviet collapse – these same communities became hotbeds of opposition to Moscow.

Past research has taken a narrower empirical scope, focusing on “snapshots” of political behavior either soon or long after a spell of violence. As a result, each previous study identified *an* effect of repression on a specific form of political behavior, measured in a specific political context, predictably leading to diverse findings. By taking a broader

view, we suggest a unifying logic to past literature. Mass repression can induce compliance, but only if the threat of resumed violence remains credible. Otherwise, it will have the opposite of its intended effect. This insight advances our understanding of historical legacies (Beissinger and Kotkin, 2014; Simpser, Slater and Wittenberg, 2018) and why they vary (Charnysh, 2015; Wittenberg, 2006; Fouka and Voth, 2016), by showing that the effects of the past are dynamic and contingent on a changing contemporary context.

THE CONTINGENT LEGACY OF REPRESSION

Theoretically, the behavioral consequences of mass repression seem uncertain. Repression can signal a regime's willingness to extract loyalty through violence (Lichbach, 1987). Acts of past repression create "internalized expectations about the ways in which authority will respond punitively toward challenging acts" (Beissinger, 2002, 326). Where repression was historically intense, citizens should expect expressions of political disloyalty to invite severe punishment from the state. However, many have argued that repression may not only fail to deter opposition, but can actually mobilize it, especially when repression victimizes many innocents (Gurr, 1971; Kalyvas, 2006; ?).

To resolve this uncertainty, we propose to view the legacy of repression as contingent on the contemporary political context. The key feature of this context relevant to citizens' calculus is the *threat of retribution*: the degree to which citizens expect to face punishment for expressing political disloyalty. High threats of retribution will create incentives for all citizens to act loyally, even if doing so contradicts their preferences (Kuran, 1995; Wintrobe, 1998). Incentives for preference falsification will be heightened in communities previously exposed to repression, which are more cognizant of the regime's punitive capacity and cruelty. When the threat of retribution is low, incentives for preference falsification dissipate, and previously-suppressed resentments – in part aggravated by repression – will manifest through various adversarial behaviors.

The concept of retributive threat is not the same as regime type. In democracies, the

threat of retribution is generally low, but not always (Davenport, 2007). Not all dictators, meanwhile, are equally reliant on extra-judicial killings and imprisonment of political opponents (Magaloni, 2008). Retributive threat is also distinct from the broader concept of state capacity, as it pertains specifically to *deterrent* capacity. Even states that struggle to provide public goods (e.g., Zimbabwe, Venezuela) can effectively deter dissent, by inducing a fear of reprisals by security forces or militias (Young, 2018).

The threat of retribution is a component of the political opportunity structure – the broader constellation of resources and institutions that constrain or facilitate citizen mobilization (Kitschelt, 1986). The political opportunity structure is “permissive” when the retributive threat is low, all else equal, and it is “restrictive” otherwise. The political opportunity structure typically changes at critical junctures like economic crises, foreign invasions (Gleditsch and Ruggeri, 2010) or power shifts between hard-liners and moderates (Beissinger, 2002). In communities exposed to past repression, local norms of political behavior will favor compliance or opposition, depending on the permissiveness of the political opportunity structure, and particularly the intensity of retributive threats.

People who experience or observe repression directly and intimately are likely to experience its effects more strongly than those who learn about it in abstract.³ Nonetheless, repression’s lessons can persist in the long run and shape the attitudes and behavior of people who did not witness it directly: parents pass political attitudes to their children (Lupu and Peisakhin, 2017), schools and religious institutions educate their audiences (Wittenberg, 2006), citizens learn their community’s political norms from their neighbors and peers (Cho, Gimpel and Dyck, 2006). Over time, these interactions shape prevailing views about politics, including which behaviors might provoke retribution from the state.

³As we report below, even though public awareness of Holodomor is near-universal in Ukraine, it has deeper behavioral effects in locations that suffered more during the famine.

TERROR BY HUNGER

We test our theory of contingent legacies of repression with evidence on Holodomor, the Soviet famine in Ukraine. Similar to famines in Ireland in 1846-1851 (Ó Gráda, 2007) and China in 1959-1961 (Meng, Qian and Yared, 2015), the politics behind Holodomor have been a focus of historiographic debate. The most common interpretation is that Holodomor was “terror by hunger” (Conquest, 1987, 224), “state aggression” (Applebaum, 2017) and “clearly premeditated mass murder” (Snyder, 2010, 42). Others view it as an unintended by-product of Stalin’s economic policies (Kotkin, 2017; Naumenko, 2017), precipitated by natural factors like adverse weather and crop infestation (Davies and Wheatcroft, 1996; Tauger, 2001). For our purposes, the key question is not whether the Soviet government actually intended to starve millions of Ukrainians to death, but how the government responded to food shortages – intentionally or not – and how the population interpreted the government’s motives and causes of their plight.

The famine occurred after a period of radical reforms to the Soviet agrarian sector, which sought to transform private farms into large-scale government-run collectives. After voluntary collectivization failed, Moscow began forcing peasants to join collective farms and demanded that they deliver fixed quotas of grain. This agricultural system, propped up and managed through coercion, put “the country on a knife-edge, highly susceptible to drought and sudden torrential rains” (Kotkin, 2017, 128). Chronic administrative and technological inefficiencies, combined with disruptions to sowing and germination due to bad weather and pests, led to a 30-35 percent drop in harvest from 1930 to 1932 (Davies and Wheatcroft, 1996, 445-447), making it impossible for many farms to meet requisition quotas.

The key feature of Holodomor that defines it as repression and sets it apart from many other famines, including other famines in Ukraine,⁴ is that party officials responded to the

⁴During famines in 1891-1892 and 1921-1923, which principally affected Russia’s Volga region, Moscow permitted foreign aid and publicly acknowledged the famine’s existence (Kul’chyts’kyi, 1993). In

poor harvest not by relaxing coercive extraction, but by taking a series of punitive steps. Blaming grain shortages on hoarding by “enemies of the state,” Soviet authorities sent State Political Directorate (GPU) agents door-to-door to confiscate food, livestock and seeds. Farms and villages that failed to meet requisition targets had to make up their losses with increased quotas for the next harvest, and were denied access to food purchases and credit. This was effectively “a death sentence... on the population of the given kolkhoz, village, or raion” (Wolowyna et al., 2016, 19). The state banned private farming, including gardening for household subsistence, and even fishing, and introduced internal passports and residency permits, preventing villagers from seeking food elsewhere.

Without food and unable to search for survival, over three million people – a tenth of Ukraine’s population – died. The famine spread beyond rural areas, with emaciated corpses lying in train stations, and orphans wandering the streets of Kharkiv, Stalino (Donets’k) and other major cities (Kondrashin, 2012, 665). By the spring of 1933, the famine has reached such horrific proportions that internal OGPU reports started discussing temporal trends not just in deaths (which became too routine), but in cannibalism and “killings for the purpose of eating,” mostly of children (Berelovich, 2005, 428-429).

The state’s vindictive response to failed grain procurements not only precipitated mass starvation, but also fostered the belief that Holodomor was a deliberate act of repression. The central government instructed local officials to interpret crop shortages as expressions of political opposition. In response, local officials saw hunger as means to punish and discipline peasants (Snyder, 2010). At the height of famine, one local official complained that “hunger has not yet taught many collective farmers good sense” (cited in Ellman, 2005). In testimonies, survivors “unanimously associated the famine with the total confiscation of all food (not only grain, but also homegrown produce) by vindictive and brutal squads of ‘activists’ or GPU agents, and... stressed that starving peasants were trapped, imprisoned in their dying villages” (Werth, 2013, xxx). Soviet intelligence

1921, the government also suspended grain requisition policies it had enacted under war communism, rather than intensifying them as in 1932-1934.

detected such sentiments as soon as the famine began. In July 1932, one official reported that “It is no secret that people are saying the grain was taken by Moscow” (Marples, 2009, 512). Perceptions of famine as an act of state violence – where “they” (Soviets) attempted to annihilate “us” (Ukrainians) – persist today (Kul’chyts’kyi, 2007). Over 70 percent of Ukrainians now view Holodomor as genocide (Rating Group Ukraine, 2017).

Schelling famously argued that the impact of coercion depends less on the punisher’s actual intent, than on the interpretation of that intent by others (1966, 2-5). In this sense, Holodomor presents a rare opportunity to evaluate the behavioral impact of repression in a theoretically plausible way. As we show later, exogenous natural factors impacted local variation in famine deaths, but the exposed population nonetheless attributed these deaths to state repression. This perception of state culpability for famine deaths in the face of exogenous factors is precisely what allows us to empirically estimate how famine, *as a form of repression*, affected later political developments.

DATA AND HYPOTHESES

We test our theoretical predictions with disaggregated data on historical famine losses and eight decades of subsequent local political behavior. Our main unit of analysis is the 1933-era Ukrainian *rayon*, a second-order administrative subdivision. Our sample comprises 386 rayons, which does not include western Ukrainian territories the USSR acquired after 1939 (Volhynia, Galicia, Transcarpathia, Budjak), Crimea, or rayons that are now part of Moldova.

We use data on rayon-level famine losses from the Harvard Ukrainian Research Institute’s *Mapa: Digital Atlas of Ukraine* (Plokhyy, 2016; Wolowyna et al., 2016).⁵ We merge these data with pre-famine covariates. From the 1926 Soviet census, we measure rayons’

⁵*Mapa* data rely on adjusted Soviet census figures. A recent study on the famine’s causes (not its political impact) by Naumenko (2017) uses raw death registry data. The two datasets have quite different estimates of the *total* famine mortality, but *cross-sectionally*, at the rayon-level, correlation between the two measures is 0.98 (Naumenko, private correspondence).

urban and rural populations, and local proportions of ethnic Ukrainians and Russians (Central Statistical Directorate of USSR, 1928-1929). Because Soviet policy favored geographic specialization in crops – which varied in resilience to weather shocks – we include crop suitability indicators for the locally dominant crop (wheat, potato, dairy) (Krupskiy and Polupyan, 1979).⁶ From historical Soviet maps, we measure the proportion of land area covered by forests – which limited arable land, and provided cover to partisans in WWII – and area devoted to heavy and light industry (Enukidze, 1928; Bondarchuk, 1962; Zhukov, 2015). The descriptive statistics are reported in Appendix 1.

We consider the effect of famine on five sets of political outcomes from 1941 to 2017. This timespan saw fundamental changes to the political opportunity structure in Ukraine, when geopolitical processes and elite power struggles – both plausibly exogenous to local circumstances in Ukraine – radically altered Moscow’s local coercive leverage. To facilitate comparisons, we scale each outcome variable so that higher values represent greater behavioral opposition to Moscow.

In chronological order, our first outcome variable is *opposition to Red partisans* in 1941-1944. For much of World War II, Ukraine was under German occupation and the threat of Soviet retribution was at best ambiguous. The main local agents of Moscow’s power were Red partisans – pro-Soviet guerrillas who attacked German supply lines, personnel and collaborators. Partisan units had limited geographic areas of responsibility, and rarely ventured outside their home rayons. While they occasionally received assistance from the center, the majority of their support – Moscow insisted – was to be “provided entirely by local resources.”⁷ Without shelter, food or information from locals, partisan units could not easily sustain operations or hide from German forces (Perezhogin, 1997).

We measure local *opposition to Red partisans* by estimating the density of partisan base

⁶A crop is locally dominant if the proportion of a rayon’s area devoted to its production is greater than that for other crops.

⁷Central Archive of the Ministry of Defense of the Russian Federation (TsAMO), F. 67, Op. 12022, D. 509, pp. 10-15.

camps per rayon, and taking its additive inverse.⁸ Large values indicate that partisan camps were scarce, implying low support or even opposition to the Soviet cause. While the absence of base camps is not necessarily evidence of pro-German collaboration, partisans often equated reluctance to support them with disloyalty (Statiev, 2014, 1542). For robustness, we later consider several alternative measures of WWII behavior.

The second outcome variable is the percentage of *anti-Soviet votes* in elections to the Supreme Soviet in 1946-1958, when Moscow's coercive capacity was indisputable.⁹ In Soviet elections, the ballot listed a single candidate nominated by the regime and a voter could only choose to vote "against all" or not. Ballot secrecy was rarely enforced and citizens had strong incentives to *appear* loyal by casting "pro-Soviet" votes (Carson, 1955). For citizens, "voting against the candidate signified dissent with the ruler" (Merl, 2011, 281). In turn, the authorities interpreted such votes as acts of disloyalty that signaled local hot-spots of opposition (Gilison, 1968; Jacobs, 1970).¹⁰ We measure *anti-Soviet votes* by matching electoral district-level voting results to 1933-era rayon borders and then calculating the percent votes cast "against all."

Our third set of political outcomes is *anti-Soviet protests* in 1987-1991. At this time, the Soviet political order was disintegrating and Moscow's coercive posture varied from inert to inconsistent. To measure protest activity in this period, we geocode Beissinger (2002)'s event database and calculate the frequency of demonstrations – against central state or party institutions, or for Ukrainian independence – in each 1933-era rayon.

The fourth set of outcomes is *anti-Russian votes* in Ukrainian parliamentary and presidential elections in 2002-2014. To construct this variable, we match polling station results

⁸Partisan base camp data are from geo-referenced Soviet military maps (Ustinov, 1973-1982; Military-Topographical Directorate of the General Staff, 1974; Grechko, 1976; Kozlov, 1985). Using the camps' point pattern, we estimate a spatial kernel with a 50km bandwidth (Chainey, Tompson and Uhlig, 2008), and multiply it by -1 . Reported effects hold at alternative bandwidths (see Appendix 7.3).

⁹Election data are from State Archive of the Russian Federation (GARF), F. R-7253, Op. 48-51, 62-63, 73-74. We were unable to collect archival data on post-1958 election cycles.

¹⁰Abstention from voting was another signal of disloyalty (Karklins, 1986), but there was too little variation in turnout figures to analyze this outcome. Soviet citizens could also request absentee ballots, but historians do not think that such actions were interpreted as acts of disloyalty (Merl, 2011, 299-300).

from Ukraine’s Central Electoral Commission (UCEC) to 1933-era rayons, and calculate the average share of votes cast against parties and candidates promoting favorable interpretations of Soviet history and closer ties to Moscow.¹¹

The fifth rayon-level outcome is *anti-Yanukovych protests* in 2009-2013, when pro-Russian president Viktor Yanukovych held office. We measure this variable by geocoding disaggregated protest data from [Ishchenko \(2013\)](#), matching them to 1933-era rayons, and calculating the number of local demonstrations against central or local government institutions. Higher counts of protests indicate greater expressed opposition to Moscow.

Finally, we supplement our community-level analyses with individual-level survey data on *opposition to pro-Russian armed groups* in eastern Ukraine in 2017 ([Kupatadze, Zeitzoff and Zhukov, 2018](#)). As the site of ongoing armed conflict between pro-Kyiv forces and Russian-backed separatists (Donets’k and Luhans’k People’s Republics, or DNR/LNR), eastern Ukraine is a place where resumed repression by pro-Moscow forces is a real possibility. The survey comprises 1,246 face-to-face interviews from September 2017, in three eastern Ukrainian provinces (Kharkiv, Donets’k, Luhans’k), randomly selected through a multistage stratified sampling design. Primary sampling units are 100 government-controlled municipalities, half of which DNR / LNR had previously occupied. We measure respondents’ opposition to pro-Russian armed groups, their views on Holodomor’s causes, and whether any of their family members died in the famine ([Appendix 2](#) gives details). In addition to addressing ecological inference concerns, the survey allows us to exploit geographic variation in the threat of coercion. To capture this variation, we count the number of days a respondent’s town or village spent under DNR/LNR control since 2014.¹²

¹¹We could not obtain high-resolution data for earlier post-independence elections. [Appendix 1.3](#) reports parties we code as “pro-Russian” in 2002. For elections after the 2004 Orange Revolution, which crystallized Ukrainian politics into clear blocs of pro-Russian and pro-Western parties, these include the Party of Regions, its successor, Opposition Bloc, and the now-banned Communist Party of Ukraine.

¹²We measure territorial control through daily situation maps released by Ukraine’s National Security and Defense Council and other sources ([Appendix 2.3](#)). To scale the variable from zero to one, we divide the duration of DNR/LNR control by the sample maximum (90 days).

Outcome	Threat of retribution	Average famine effect
<i>Rayon-level</i>		
Opposition to Red partisans (1941-1944)	Varies temporally, mostly weak	+
Anti-Soviet votes (1946-1958)	Uniformly strong	-
Anti-Soviet protests (1988-1991)	Varies temporally, mostly weak	+
Anti-Russian votes (2002-2014)	Uniformly weak	+
Anti-Yanukovych protests (2009-2013)	Uniformly weak	+
<i>Individual-level</i>		
Opposition to pro-Russian groups (2017)	Varies geographically, mostly weak	+

Table 1: POST-FAMINE OUTCOMES, RETRIBUTION THREAT, AND HYPOTHESIZED EFFECTS.

Table 1 summarizes our hypotheses with respect to each post-repression outcome. Three of our outcomes fall entirely within historical periods when the threat of retribution was uniformly strong (anti-Soviet votes) or weak (anti-Russian votes, anti-Yanukovych protests). Accordingly, we expect fewer anti-Soviet votes, but more anti-Russian votes and protests in rayons exposed to more famine.

Three other outcomes (opposition to partisans, anti-Soviet protests, opposition to pro-Russian armed groups in 2017) unfolded in volatile conditions, with a variable threat of retribution. In the early stages of WWII, Germany had near-complete control over Ukraine, which obviated the local threat of Soviet retribution. In late 1943, as the tide of the war turned in Moscow's favor, locals saw the Red Army returning and state security services resurrecting the threat of Soviet coercion (Priemel, 2015). Since most of this era saw a low threat of Soviet retribution, we expect famine to have inflamed opposition to Red partisans, on average. We then disaggregate this outcome by year, to study the effect of shifting expectations of retribution after 1943.

Anti-Soviet protests in the late 1980's also unfolded in a volatile environment, when Moscow's retributive threat was initially high, and then declined, with sporadic crack-downs on protests. Since the threat of retribution was weak, on average, in 1987-1991, we expect a positive famine effect on protests throughout this period. Later, we explore how

this relationship changed depending on the regime’s responses to protests.

Since 2014, much of the variation in coercive threats has been geographic: between territories Kyiv always controlled and those where pro-Russian separatists had previously established a foothold. DNR/LNR have openly embraced Soviet symbols and methods to suppress dissent and consolidate power, including “nationalizing” large agribusinesses on territories they control, and requisitioning crops from farmers on “state-owned” land.¹³ While we generally expect descendants of famine victims to be more likely than non-descendants to express anti-Moscow views, this relationship should be weaker among descendants who experienced separatist rule.

EMPIRICAL STRATEGY

Our identification strategy exploits exogenous variation in local famine mortality due to weather shocks. Although Ukraine has extremely fertile soil, it is susceptible to adverse weather that occasionally causes dramatic agricultural losses (Kogan, Adamenko and Kulbida, 2011). In 1931-1932, successive waves of heat, cold, drought and excess rainfall disrupted germination and sowing, caused plant infestations, and prompted a drop in yield (Davies and Wheatcroft, 2009; Tauger, 2001). This decline in production resulted in locally more intense punitive behaviors by the state, and led to more deaths.

We use historical monthly mean air temperature and precipitation data (0.5×0.5 degree grid, Matsuura and Willmott 2014), spatially matched to 1933-era rayons (see Appendix 1.2). Because the famine’s main wave peaked in early 1933 (Rudnytskyi et al., 2015), we use weather variables from January 1931 to December 1932, consistent with time windows emphasized in historical literature (Davies and Wheatcroft, 2009; Tauger, 2001). We define *weather shocks* as deviations from median rainfall and temperature in each rayon and month in 1926-1930 – a benchmark period for Soviet agricultural plan-

¹³“Self-proclaimed Donetsk republic to ‘nationalize’ farms of Akhmetov, Novinsky,” *UNIAN News Agency*, June 26, 2015; Decree of the Head of the Donetsk Peoples’ Republic no. 291, 3 November 2017.

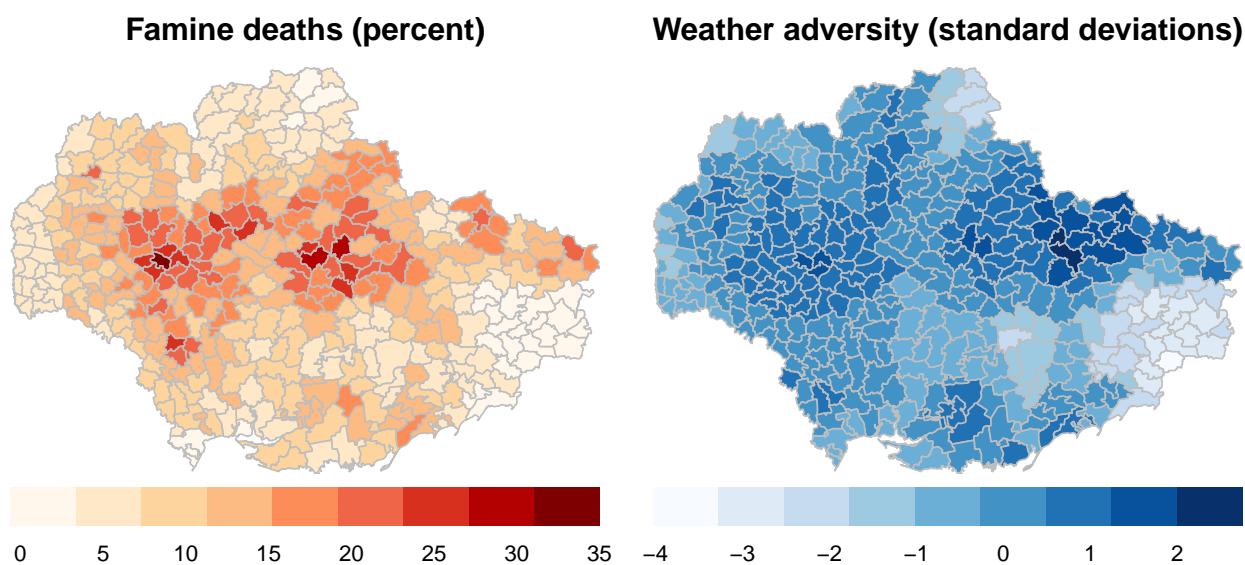


Figure 1: FAMINE DEATHS AND WEATHER ADVERSITY.

ning. By construction, these shocks have no seasonal variation and capture locally unusual weather, which is most disruptive for crops (Cantelaube and Terres, 2005).

Due to the high number of potential instruments (2 monthly weather shocks \times 12 months \times 2 years = 48), we adopt several approaches to systematically select weather shocks (Appendix 3). First, we select weather shocks that have appeared in historical research on famine (e.g. Davies and Wheatcroft, 2009; Tauger, 2001). Second, following Belloni et al. (2012), we use LASSO and Bayesian model selection to identify a subset of weather shocks that best predict famine mortality. Third, we use Bayesian model averaging (Raftery, Madigan and Hoeting, 1997) to construct a scalar index of *weather adversity* – a linear combination of weather shocks that optimally predict local variation in famine mortality. The three types of instruments lead to very similar results, as we discuss below. Because a scalar index permits the most efficient and interpretable instrument plausibility and placebo tests, we use the third measure in our baseline specifications.

Figure 1 shows the distribution of famine deaths (percent of rayon population) and the weather adversity index (standard deviations from mean). The variables are strongly

correlated: all else equal, a standard deviation increase in weather adversity is associated with 2.8 percent greater famine fatalities ($p < 0.001$). Appendix 4 discusses, quantitatively and qualitatively, potential mechanisms connecting weather shocks to famine.

Specification

We use the following two-stage regression specification:

$$\ln(\text{Famine}_i) = \theta \cdot \text{Weather}_i + \text{Oblast}_{j[i]} + \beta' \mathbf{x}_i + \mathbf{v}_i + \epsilon_i, \quad (1)$$

$$y_i = \alpha \cdot \widehat{\ln(\text{Famine}_i)} + \text{Oblast}_{j[i]} + \zeta' \mathbf{x}_i + \mathbf{v}_i + u_i, \quad (2)$$

For each political outcome, denoted by y_i , we estimate the parameter α : the causal effect of weather-induced famine deaths. The control variables x_i include pre-famine population, proportion rural population, proportion of Ukrainians and Russians, forestation, industrialization, and dominant agricultural products (wheat, potato, dairy). Since proximity to Russia could be a confounding factor, we flexibly control for distance to the Russian border using cubic regression splines. We also include oblast fixed effects to account for variation in political outcomes due to regional political and socio-economic differences.

Because famine deaths and political outcomes are geographically clustered, both equations include synthetic spatial covariates \mathbf{v}_i (Moran eigenvectors) to remove autocorrelation from second-stage residuals (Dray, Legendre and Peres-Neto, 2006). To account for regional differences in covariance structures, we cluster standard errors by oblast. Since the treatment and most outcomes are aggregates whose measurement is more precise in large-population areas, we weight observations by pre-famine population.¹⁴

¹⁴This measurement issue especially concerns protest counts collected from media sources, which are more likely to miss events in sparsely populated areas. Removing regression weights does not qualitatively affect inferences (Appendix 7).

Instrument Plausibility

A potential concern with our empirical design is that weather instruments “depoliticize” famine – they identify effects that are attributable to natural causes, not repression. The primary causes of Holodomor were political, in that the famine would not have occurred without collectivization, forcible grain requisitions, punitive quotas, mass arrests, and movement restrictions. Nonetheless, archival evidence and multiple historical studies (Davies and Wheatcroft, 2009; Kotkin, 2017; Tauger, 2001) suggest that Ukrainian locations that experienced worse weather also saw more famine deaths, in part because these conditions intensified the deleterious effects of Soviet policies.¹⁵ Crucially, however, even where natural causes contributed to famine mortality, citizens attributed famine deaths to the regime.

The first piece of evidence in support of this claim comes from our survey, which asked respondents if they considered Holodomor a “premeditated Soviet attempt to destroy the Ukrainian people” (*genocide*) and whether Holodomor was “largely due to crop failure, and not Soviet actions” (*natural causes*). We regressed answers to these questions on pre-famine weather adversity. As Table 2 shows, respondents who reside in rayons with adverse weather in 1931-1932 are *more* likely to see Holodomor as genocide and *less* likely to attribute it to natural factors. Bad weather did not lessen the perceived culpability of the Soviet regime – it intensified it.

A second piece of evidence can be found in contemporaneous archival documents and memoirs of famine witnesses (discussed in detail in Appendix 5), for whom bad weather laid bare the merciless nature of Soviet collectivization and grain procurement. Places hit by bad weather had less food to start with, but peasants watched as authorities went “relentlessly tramping from house to house, confiscating everything edible they

¹⁵A study by Naumenko (2017) finds that the *onset* of famine could not have been caused by weather because there was no major global weather shock in 1931-1932. While we fully agree with that conclusion, our results show that adverse weather nonetheless explains some of the *cross-sectional* variation in famine mortality, conditional on its onset.

	Holodomor was genocide	Holodomor had natural causes
Weather adversity in 1931-32	0.25 (0.04)**	-0.16 (0.04)**
Observations	989	994

OLS coefficients for rayon-level weather adversity. Standard errors in parentheses clustered by 1933 rayons. Outcome variables measured on 5 point Likert scale. Significance levels: † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$.

Table 2: WEATHER AND ATTRIBUTION OF FAMINE’S CAUSES IN SURVEY.

could find in their attempt to meet state quotas” (Dolot, 1985, 174, 222). The regime’s willingness to punish peasants for missing quotas tended to politicize famine deaths, even where weather or other exogenous forces were behind the poor harvest.

Furthermore, places hit by worse weather observed more conspicuous *acts* of state repression. The Central Committee of Ukraine’s Communist Party explicitly disallowed the use of weather and other exigencies as excuses for missing quotas. Local authorities were instructed to treat all grain shortages as acts of political sabotage:

This sharp decline cannot be explained by any objective causes like rain and so on. The Central Committee believes that the main reason is bad organizational work in the area of grain procurement... This shows that ... resistance and sabotage organized by kulak counter-revolutionary elements and their conspirators is not yet broken, the repressive measures against them are applied insufficiently and too hesitantly.¹⁶

These “insufficiently applied” repressive measures included confiscating livestock and food, using “blacklists” to deny villages access to food purchases, credit and grain advances, along with public beatings, harassment and mass arrests, which were, even by internal admissions, indiscriminate and “over-the-top” (Appendix 5). Later, when Soviet authorities attempted to hide the history of famine, locals interpreted these denials as further evidence of state culpability (Applebaum, 2017). In view of this, it is unsurprising

¹⁶Decree No. 17 of Central Committee of the CP(b) of Ukraine “On the application of repressive measures against collective farms that sabotage grain procurement,” November 27, 1932, Central State Archives of Public Organizations of Ukraine, F.1, Op.6, Sp. 238, Arch. 21-22.

that perceptions of state repressiveness would be higher in places hit by bad weather: these places saw more famine deaths and more open expressions of state violence.

RESULTS

Community-Level Effects

Table 3 reports OLS and IV estimates of the effects of famine on the five rayon-level political outcomes. For comparability, we normalized each outcome so that coefficients represent the effect of doubling per capita famine mortality on standard deviation changes in the outcome.¹⁷ Instruments are strong across all specifications, as first stage F -statistics indicate.¹⁸ OLS and IV estimates are identical in direction and similar in magnitude, except for two protest variables where OLS coefficients are substantially smaller, which may indicate that there are omitted variables correlated with famine mortality and protests.¹⁹

The results align closely with our theoretical expectations. First, in 1941-1944, Red partisans had a significantly harder time operating in rayons hard-hit by famine, even after accounting for forest cover, ethnicity, and other factors that might have facilitated guerrilla warfare. In substantive terms, doubling famine mortality reduced the density of partisan base camps by 0.77 standard deviations (IV specification). This result – suggesting that past repression inflames opposition when the original repressor cannot credibly threaten retribution – resonates with anecdotal accounts of how famine’s memories contributed to local support for German forces early in the war. As one woman recalled, “We were all so happy to see them [Germans]. They were going to save us from the Commu-

¹⁷We adopt this normalization due to differences in scale and units of measurement across outcome variables. Appendix 6 reports coefficient estimates using non-normalized outcomes.

¹⁸These F -statistics adjust for clustering at the oblast level and the use of multiple weather variables in constructing the weather index (Appendix 6). The F -statistics differ across models because of different spatial synthetic covariates. Moran’s I statistics for second stage residuals are insignificant across all models (see Appendix 6), indicating that our synthetic spatial covariates successfully removed residual autocorrelation.

¹⁹Another possibility (which we consider in Appendix 7) is that IV estimates for protests are larger due to exclusion restriction violations.

Dependent variable	OLS	IV	First-stage F
Opposition to Red partisans (1941-1944)	0.35 (0.05)**	0.77 (0.09)**	12.40
Anti-Soviet vote (1946-1958)	-0.44 (0.07)**	-0.45 (0.14)**	13.07
Anti-Soviet protests (1987-1991)	0.07 (0.12)	0.45 (0.15)**	11.72
Anti-Russian vote (2002-2014)	0.19 (0.04)**	0.36 (0.06)**	13.48
Anti-Yanukovich protests (2009-2013)	0.05 (0.13)	0.50 (0.17)**	12.17

The estimates are for the effect of logged famine mortality using normalized outcomes. IV specification uses weather adversity index as instrument. All models control for pre-famine total population, rural population, proportion of Ukrainians and Russians, forestation, industrialization, crop suitability, oblast fixed effects, synthetic spatial covariates, and cubic spline for the distance to Russian border. Standard errors are clustered by oblast. Full TSLS output reported in Appendix 6. Significance levels (two-tailed): † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$.

Table 3: FAMINE MORTALITY AND POST-FAMINE AVERAGED OUTCOMES.

nists who had taken everything and starved us” (Alexandrow and French, 1995, 56).

Second, after Moscow unambiguously re-established its rule in Ukraine, localities more exposed to famine became less likely to cast anti-Soviet votes in elections (by about 0.50 standard deviations). In 1946-1958, Moscow showed no hesitation in using mass deportations, killings, and other violence against anti-Soviet insurgents in western Ukraine and the Baltic States – areas Stalin annexed in 1939, and which did not experience famine in 1933. While most of this renewed coercion occurred outside our study region, the state’s predisposition to extreme violence was beyond question. Consistent with our expectations, the effect of famine on anti-Soviet votes is negative and statistically significant in this period. The very same communities that were less supportive of Soviet authorities on the battlefield now signaled their loyalty to the regime at the ballot box.

Third, places that experienced greater famine saw more anti-Soviet protests in 1987-1991, when the regime’s ability to suppress behavioral challenges was again in doubt. Earlier, Soviet authorities either violently cracked down on street protests (as in Novocherkassk in 1962), or systematically arrested key participants (as they did under Brezhnev). In the late 1980’s, the state’s responses became sporadic and inconsistent, lowering “public expectations about the probability of successful demobilization by force”

(Beissinger, 2002, 330). The magnitude of this effect approximates that on anti-Soviet votes, but in the opposite direction. While many differences exist between anti-Soviet votes under Stalin and protests before the Soviet collapse – as we discuss below – the complete reversal of famine’s effect is significant evidence that the legacy of repression is contingent on threats of retribution.

Finally, in 2002-2014, when Moscow’s coercive leverage in independent Ukraine was very limited, citizens could express their anti-Russian (and anti-Soviet) preferences without fear of reprisals. Table 3 shows that communities more exposed to famine saw significantly lower electoral support for pro-Russian parties (by 0.36 standard deviations) and significantly more protests (by 0.50 standard deviations) against the “pro-Russian” government of Viktor Yanukovich.

The above results are robust to alternative specifications, alternative weather instruments and measures of WWII behaviors; in addition, these results are not driven by potential outliers or the measurement error in our weather instrument, as we show in Appendix 7. We also conducted a placebo test to evaluate whether potential violations of the exclusion restriction are driving our estimates. Our placebo test exploits the fact that western Ukraine (which is outside our sample) became part of the Soviet Union only in 1939, and did not experience famine in 1933 despite similar climatic conditions to Soviet-administered Ukraine. Therefore, the causal channel relating weather adversity to post-famine political behavior was effectively blocked in these territories. If the reduced-form relationships between weather and political outcomes in western Ukraine are similar to those in central-eastern Ukraine (our sample), this would indicate that weather affected those political outcomes through channels other than famine. Although a single test cannot rule out all potential violations of the exclusion restriction, the placebo tests in Appendix 8 do not indicate problems with the instrument validity: the reduced-form relationships between weather adversity and post-famine outcomes closely resembles the IV estimates in central-eastern Ukraine, but not in western Ukraine.

Individual-Level Effects

To see if the community-level effects of famine also hold for individuals, we turn to our survey data. Our dependent variable here is an index measure of opposition to pro-Russian armed groups.²⁰ The independent variable, *Family losses*, is equal to one if a respondent's immediate or extended family members died in the famine.²¹ We expect individuals who lost family members to be more opposed to pro-Russian separatists. However, this effect should attenuate among respondents who had lived under DNR/LNR control, where Moscow's retributive threat was more apparent.

Table 4 reports OLS coefficients for three regressions. In column 1, we regress the index measure of opposition on *Family losses*. We see that descendants of famine victims tend to express substantially more opposition to pro-Russian separatists. In column 2, we interact famine losses with *DNR/LNR* control, and find that the marginal effect of *Family losses* is decreasing in the duration of separatist control.²² The effect of family losses is 0.38 in areas that pro-Russian separatists never controlled, but it falls to $0.38 - 0.46 = -0.08$ in places they controlled for 90 days. Column 3 restricts comparisons to the immediate conflict zone of Donets'k and Luhans'k oblasts. Here, differences between marginal effects are even more pronounced: 0.46 versus $0.46 - 0.60 = -0.16$, respectively.²³

In sum, individuals whose families were victimized by famine are more willing to express opposition to pro-Russian groups, except in areas these groups recently controlled. While point estimates in DNR/LNR strata are opposite in sign to those in non-DNR/LNR strata, they are smaller and statistically indistinguishable from zero (although the difference between coefficients is significant). Our sample comprises only government-

²⁰We measure *opposition to pro-Russian armed groups* as the average of four variables, each on a 5-point Likert scale: "support for Ukrainian army," "support for Right Sector" (nationalist militia), 6—"support for Russian army," and 6—"support for DNR/LNR."

²¹72 percent of respondents were third-generation residents of Ukraine, including 43 percent who lived in the same village as their grandparents. The percentage who reported losing family members to famine is about the same for multi-generational residents as for first-generation newcomers (19 and 21 percent).

²²Recall that *DNR/LNR* varies from zero (never controlled) to one (controlled for 90 days).

²³Appendix 9 considers several robustness checks and alternative estimators, and shows that survey results are unlikely to be due to biased sample attrition.

	Full sample	Full sample	Conflict region
Family losses	0.34 (0.07)**	0.38 (0.10)**	0.46 (0.11)**
Family losses × DNR/LNR		−0.46 (0.22)*	−0.60 (0.24)*
DNR/LNR		−0.89 (0.31)**	−0.11 (0.32)
Observations	1182	1182	832

The dependent variable is the index measure of opposition to pro-Russian separatism. OLS coefficients with standard errors in parentheses clustered by 1933 rayons. Significance levels: † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$.

Table 4: FAMILY-LEVEL EFFECTS OF FAMINE LOSSES BY COERCION THREAT.

controlled settlements where separatist rule lasted 90 days at most, and so it is possible that longer pro-Russian control – and a more intense retributive threat – would have further amplified this deterrent effect in DNR/LNR strata.

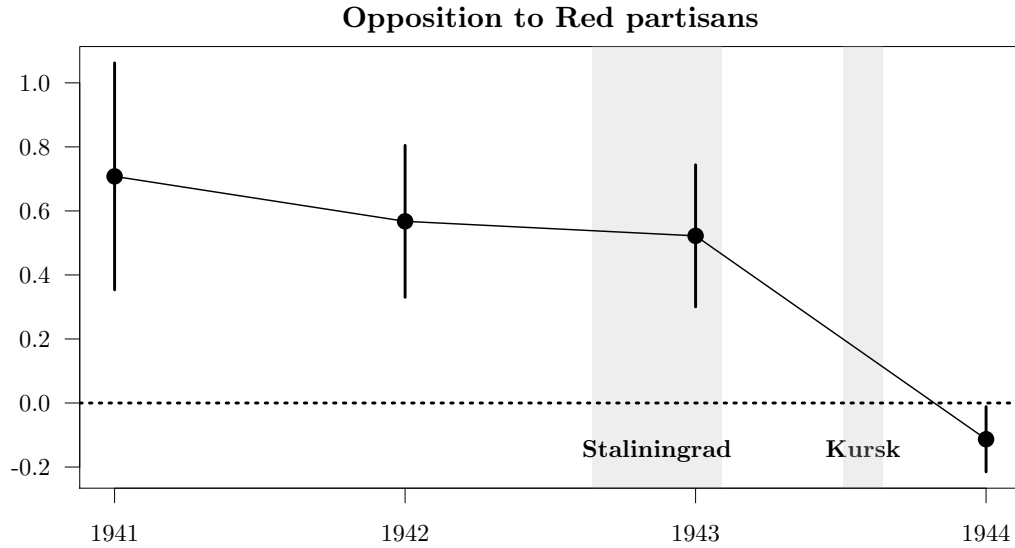
ALTERNATIVE EXPLANATIONS

We attribute the heterogeneity in famine’s behavioral effects to changes in the political opportunity structure across time (in rayon-level analyses) and space (in survey analyses). These changes – fallout from geopolitical crises and elite power struggles in Moscow – were plausibly exogenous to local events in Ukrainian rayons. Nonetheless, other explanations of this heterogeneity warrant consideration.

Incomparability of Political Behaviors

It is possible that differences in political behaviors, not political conditions, explain the observed heterogeneity in famine’s effects. Opposing pro-regime guerrillas is different from protesting or voting, and placing these side-by-side can be misleading. We therefore examine the heterogeneity of famine effects *within* two cases when political opportunity structures changed, but citizens’ choices and overall background economic and social conditions stayed largely the same: WWII and the late Soviet era.

We begin by considering how famine’s effect on Red partisan support varied through



The figure shows IV coefficients for famine mortality on the local opposition to Red partisans (in terms of standard deviations from each year's mean). The vertical bars are 95% confidence intervals.

Figure 2: FAMINE EFFECTS ON RED PARTISANS BY YEAR.

different stages of WWII. This disaggregation can help reveal short-term heterogeneity, while holding constant key fundamentals like war, regime type, economic deprivation, and collectivized agriculture (which continued under German occupation). Figure 2 shows IV coefficient estimates broken down by year (the highest available resolution).²⁴ At the start of WWII, opposition to Red partisans was strongest in famine-ridden areas. This effect gradually declined until 1943, and then reversed. By 1944, Red partisans were encountering significantly *less* opposition in famine-ridden areas than elsewhere.

The structural shift in famine's effect between 1943 and 1944 corresponds to changing expectations about the war's likeliest outcome, and the type of repression that would subsequently ensue. While the outlook in 1941 favored an eventual German victory (Overy, 1998, 94-96), these expectations changed after Soviet successes in Stalingrad (February 1943) and Kursk (August 1943) – the latter being Germany's final strategic offensive in the east. Germany's weakened position soon became apparent to civilians, as occupying authorities began dismantling industrial installations and offered concessions – particularly

²⁴For comparability, we normalized outcome variables as standard deviations from annual means.



Figure shows IV coefficients with 95% confidence intervals from the model fit on a three month window rolled forward by 30 days. Dependent variables are standard deviation shifts in the incidence of anti-Soviet protests. Hollow circles are for windows with insufficient data.

Figure 3: EFFECTS OF FAMINE MORTALITY ON ANTI-SOVIET PROTESTS BY TIME.

in land use – to gain local support (Priemel, 2015, 49). Ukrainians, in turn, interpreted these moves as a “sure sign that they’re taking to their heels” (Berkhoff, 2008b, 139). Seeing clear indications that the USSR – and its secret police – was returning in full force, famine-ridden communities began to fall in line.

A second period of short-term variation in Moscow’s retributive threat came in 1987-1991, when the regime’s posture toward protesters swiftly oscillated between passivity and sporadic confrontation. To evaluate heterogeneity in famine’s effect on protests, we took three initial months of protest data and calculated a normalized protest count within that window for each rayon. We then fitted our baseline IV regression, and iteratively advanced the time window by 30 days until December 1991. Figure 3 reports the coefficients for each of those windows. While many factors were behind this dynamic, expectations of the regime’s likely response to dissent appear to have played a role.

In the spring of 1989, authorities permitted the founding of the People’s Movement of Ukraine (Rukh), a civic movement that served as a platform for anti-Soviet dissidents

and Ukrainian nationalists. After this political opening, which signaled a more accommodating stance toward expressions of anti-Soviet attitudes, the marginal effect of famine increased and became statistically significant. Famine's marginal effect peaked in the winter of 1989-1990, when the percentage of protests resulting in arrests across the USSR fell from 14% in August to 2% in January. During this period, security forces sought to "avoid participating in internal conflicts... and this position of being a sideline observer... stimulated action... by forces in society" (Beissinger, 2002, 352). The effect of famine on anti-Soviet protests attenuated when Moscow took a more punitive posture – as in late 1990, when arrests rose from 1% of protests in August to 9% in December, culminating with an unsuccessful military intervention in Vilnius, Lithuania in January. This shift in expectations – and positive famine effect – solidified after the army's withdrawal from Vilnius, and continued through Ukraine's declaration of independence in August 1991.

Changes to Ethnic Composition

A second possibility is that famine affected political behavior by changing the local ethnic balance. Soviet authorities attempted to resettle famine-ridden areas with more "trustworthy" inhabitants from Russia and elsewhere in Ukraine, but most new settlers did not stay permanently (Iefimenko, 2013). Nonetheless, ethnic composition may still have changed due to differential death rates or residential sorting after the famine.²⁵

The ethnic explanation could systematically account for our results if famine first increased the local proportion of Ukrainians (to explain anti-Soviet behavior in 1941-1943), then these same localities abruptly became more Russian (to explain pro-Soviet behavior in 1944 and 1946-1958), and Ukrainian again (to explain later patterns). Such extreme fluctuations in ethnic composition do not seem plausible.

²⁵According to Soviet census data, 86 percent of Ukrainian-born citizens were still living in Ukraine in 1989, with 69 percent residing in oblasts of birth (http://www.demoscope.ru/weekly/ssp/sng_pob_89.php). Migration should bias our estimates toward zero: if current residents have fewer personal connections to those who witnessed the famine, the famine's effect on local political behavior will be weaker.

We find no quantitative evidence that famine affected politics by changing local ethnic composition. Using our baseline IV specifications, we estimated the effect of famine on rayon-level proportions of Ukrainians and Russians in 1939 and 2001.²⁶ Famine had no effect on local ethnic composition in 1939, suggesting that famine-induced ethnic changes cannot account for political behaviors during and after WWII (see Appendix 13.2). However, famine did increase the local proportion of self-identified Ukrainians in the 2001 census. This change in ethnic self-identification and language adoption is consistent with our story: rejecting the repressor's identity is itself a form of behavioral opposition (cf. Balcells, 2012), and this option became less costly in independent Ukraine. That said, causal mediation tests reported in Appendix 13.2 show no evidence that ethnic composition in 2001 could be a mediator explaining our post-Soviet results.

Political Mobilization and Propaganda

Yet another possibility is that the effects of famine varied due to political mobilization by different incumbent authorities. In 1941-1943, Germany may have used propaganda and agricultural policy to mobilize famine survivors against Moscow. After WWII, Soviet authorities may have sought to mobilize the same communities to act more loyally. In the post-Soviet era, the increasing salience of Holodomor in Ukrainian politics could have similar effects. We discuss each of these possibilities in turn.

German occupation. Although Germany's occupation regime did exploit famine memories for propaganda purposes (Applebaum, 2017), it is doubtful that these efforts explain why famine-ridden communities initially behaved more anti-Soviet. German-sponsored Ukrainian press discussed the famine early in the war, mostly to incite anti-Semitism. Yet the bulk of Nazi propaganda focused on convincing locals that Stalin was defeated and major Russian cities have fallen (Berkhoff, 2008b, 50-51, 120). Famine was a risky propaganda topic for Germany, because it cast a spotlight on the Reich's own coercive

²⁶It is possible that other, potentially unobservable post-famine demographic changes affected politics, but we cannot evaluate them empirically.

food extraction practices, which were heavily modeled on the Soviet example (Snyder, 2010, 160-162). Under Himmler's Generalplan Ost, Germany embraced starvation to coerce and numerically reduce Ukraine's "superfluous" population, confiscating food from "idling" peasants, searching homes for grain, imposing compulsory farm labor, and using threats of renewed famine to deter collaboration with partisans (Berkhoff 2008a, 175, Statiev 2010, 62-65). These practices were difficult to reconcile with propaganda emphasizing the relative brutality of Soviet agricultural policies.

To further investigate this alternative explanation, we examine how experiences of famine affected battlefield behavior of Red Army soldiers drafted from Ukraine.²⁷ If, indeed, it was German propaganda that activated anti-Soviet behaviors during the early stages of WWII, then famine should not have affected the behavior of Red Army soldiers who were exposed to Holodomor while living in famine-ridden areas, but not exposed to German propaganda in occupied territories.²⁸

We tested this empirical implication with the personnel records of 1,048,986 Red Army soldiers and officers born on the territory of Soviet Ukraine (Appendix 11). After matching individuals' birth locations to 1933 rayons, we calculated local *Battlefield disloyalty* scores: the share of soldiers born in each rayon who either deserted, defected, committed treason, were captured or missing.²⁹ We also calculated rayon-level *Battlefield sacrifice* scores: proportion of soldiers killed or wounded in action. We regressed these outcomes on famine mortality, using our baseline IV specification. Table 5 confirms that battlefield disloyalty was higher and sacrifice lower among Soviet soldiers from famine-ridden areas. These results support Soviet accounts during the famine that "problems with bread

²⁷ Although soldiers made decisions under different circumstances than civilians in WWII, constraints on their behavior were arguably more onerous: authorities more closely monitored their movements, and instituted harsh discipline for desertion, including capital punishment (Overy, 1998, 81-82).

²⁸ The assumption is valid if soldiers enlisted before the occupation, did not receive letters from families re-stating German propaganda, and were not exposed to famine-related propaganda on the battlefield. These conditions are all reasonable, given Soviet military censorship practices (Somov, 2003).

²⁹ Wartime Soviet law equated being captured or missing with treason. Stalin's Order 270 decreed that personnel who "flee to the rear or surrender to the enemy shall be considered malicious deserters, whose families are liable to be arrested" (Zolotarev, 1997, 58-60).

	Battle-field disloyalty	Battle-field sacrifice
Famine (IV coefficient)	0.41 (0.21) [†]	-0.51 (0.26) [†]

Effects of famine mortality in the Red Army soldier’s birth rayons on their battle-field performance (rayon-level averages). IV regressions using baseline specification and standard errors clustered by oblast. Significance levels: [†] $p < 0.1$; * $p < 0.05$; ** $p < 0.01$.

Table 5: FAMINE AND BATTLE-FIELD BEHAVIOR IN WWII.

and material difficulties” negatively affected morale (Kondrashin, 2011, 284-285). They do not support the notion that German propaganda drove anti-Soviet behavior in WWII.

The Soviet period. Could pro-Soviet behavior in famine-ridden communities after WWII have resulted from propaganda or electoral mobilization efforts by local authorities? In principle, this would have been highly unlikely. Famine was a taboo topic at all levels of government, and local authorities – like the Germans – had neither administrative incentives nor accurate information about famine fatalities to target their efforts in this way.

To consider this possibility more directly, we preformed several tests (described in Appendix 12). First, we collected data on the locations of monuments to Lenin – a crucial tool of Soviet propaganda – built by Soviet authorities in Ukraine. If propagandists targeted famine-ridden communities, we should see more Lenin statues in such places. Second, using archival records on candidates in Supreme Soviet elections, we evaluated whether candidates with greater vote-mobilization capacity – Communist Party members, decorated war veterans, or ethnic Ukrainians – were more likely to be nominated in high-famine areas. If electoral mobilization was more intense in famine-struck rayons, Moscow should have nominated higher quality candidates there. As IV coefficients in Table 6 show, neither of these predictions hold: famine-ridden communities did not see more monuments to Lenin, or the nomination of higher quality candidates.³⁰

In Appendix 12, we consider several additional Soviet actions that might help explain a negative effect of famine on behavioral challenges during the Soviet period: vote fal-

³⁰We define candidates as “high-quality” if they have all three characteristics mentioned in the text, but results hold if we analyze each characteristic individually, as shown in Appendix 12.2.

	Lenin's monuments	Candidate quality
Famine (IV coefficient)	0.04 (0.38)	-0.28 (0.31)

Effects of famine mortality on rayon-level count of Lenin's statues and average quality of nominated candidates in Soviet elections (rayon-level averages). IV regressions using baseline specification and standard errors clustered by oblast. Significance levels: $^{\dagger}p < 0.1$; $*p < 0.05$; $**p < 0.01$.

Table 6: EFFECTS OF FAMINE ON SOVIET PROPAGANDA AND ELECTORAL MOBILIZATION

sification, famine relief, and economic investment. Neither qualitative nor quantitative evidence indicates that these efforts are behind the reported results.

Finally, ethnographic evidence suggests that famine-ridden communities were expressing more *pro-Soviet* attitudes long before before WWII. Shortly after the famine, one visitor was stunned that Ukrainian villagers appeared *more* supportive of the regime (Goychenko, 2012, 300-301). In 1933, another visitor was outraged that people in his birth village so quickly “forgot” and “forgave” what Soviet authorities did (Galagan, 1956). Peasants who observed and survived the horrors of famine clearly declared their political loyalties: “We will do everything expected of us” (Kotkin, 2017, 130). Post-WWII Soviet actions cannot account for such immediate effects.

Post-Soviet period. After the Soviet collapse, Holodomor was no longer a taboo topic and its cultural and political salience rose significantly in Ukraine. Could this increased public awareness explain anti-Russian behavior in famine-ridden areas today? To investigate this possibility, we examined whether the frequency of references to Holodomor in Ukrainian media and parliamentary debates aligns with temporal variation in famine's effect (Appendix 13). We found no synchronicity between these trends. The famine's political salience peaked after the Orange Revolution (especially in 2006-2007) and after Euromaidan protests in 2013. Yet the famine's inflammatory effect was strongest in 2002-2004 – before the issue had become a staple of domestic politics – and weakest in the two 2014 elections, at the peak of Holodomor's salience.³¹

³¹The larger marginal effect in 2002-2004 is consistent with our theory, since it preceded the Russian-Georgian War of 2008 and other signals of heightened coercive threat from Moscow.

Overall, we find no consistent empirical support for any of the theoretically plausible alternative explanations for why the effects of famine varied the way they did. It is quite possible to formulate an alternative explanation for each individual finding. Taken as a whole, however, the changing political opportunity structure remains the simplest plausible explanation of our findings.

MECHANISMS OF PERSISTENCE

What explains the remarkable durability of famine's political effects? Past research on historical legacies draws a distinction between the legacy of living through an event and the legacy of the event itself (Pop-Eleches and Tucker, 2017). One could attribute the short-term effects of famine to its transformative impact on the beliefs, attitudes or norms of those who witnessed it (cf. Simpser, Slater and Wittenberg, 2018). Yet the fact that famine still shapes local political behavior eighty years later suggests that its legacy has taken deeper roots.

Existing literature has highlighted several potential channels by which the political lessons of violence can persist, including state propaganda (Charnysh, 2015), religious institutions (Wittenberg, 2006), and family influences (Balcells, 2012; Lupu and Peisakhin, 2017). We do not exclude any of these mechanisms, although quantitative and anecdotal evidence is more supportive of some than others. State propaganda and mobilization, as we have shown, did more to suppress famine memories in the Soviet period, and do not explain much variation thereafter. The Ukrainian Orthodox Church (UOC) served as an incubator of famine memories among the diaspora during Soviet times (Sysyn, 2016), but in post-Soviet Ukraine the church has been split on the issue. UOC-Moscow Patriarchate's most recent head, Metropolitan Onufriy, called Holodomor "retribution from God" (Haran and Zdioruk, 2012). The family-centered mechanism seems consistent with our survey evidence of anti-Russian views among famine victims' descendants. However, since only 20 percent of our sample acknowledges losing family members to famine,

our discovery of consistent effects on *aggregate* political behaviors suggests that family is not the only mechanism of persistence.

Our survey data show that respondents from high-famine areas are more likely to hold anti-Russian sentiments than those in low-famine areas, *independently of whether their own relatives were victims* (Appendix 14). Thus, while important in its own right, family-level exposure is insufficient to explain famine's persistent effects. As is typical in other cases of mass violence (Blaydes, 2018; Rozenas, Schutte and Zhukov, 2017), people who lived through Holodomor perceived it as an assault not against individuals or families, but against their *communities*, geographically or ethnically defined (see the narratives of survivors in Appendix 5). It is not surprising, therefore, that people living in famine-ridden areas would become exposed to narratives of group victimization – not only through their relatives, but also their friends, neighbors, co-workers and other community members. This community-level mechanism of persistence warrants closer study in future work.

CONCLUSION

To understand how indiscriminate mass repression affects political behavior, we analyzed the legacy of famine in Soviet Ukraine. We find that Stalin's "terror by hunger" had a contingent political legacy. Ukrainian localities that experienced harsher famine in 1933 behaved more loyally toward Moscow when and where a threat of retribution for anti-Soviet behaviors was present and clear – in the late stages of WWII and in the aftermath of the war, as well as in the areas that had been controlled by pro-Russian separatist forces. However, these same localities behaved disloyally when such threats abated – in the early stages of WWII, during and after the breakdown of the Soviet Union. Past mass repression can deter behavioral challenges, but only if a regime can credibly threaten violence in response to expressions of opposition.

Our evidence for this proposition draws from a single country, and as such, the usual caveats about external validity apply. Recent research, however, suggests that changes

to the threat or retribution – or political opportunity structure more generally – can help explain patterns in other, vastly different environments. Studies in democratic settings – where threats of coercion are generally low – tend to document inflammatory effects of past repression (Balcells, 2012; Costalli and Ruggeri, 2015; Fouka and Voth, 2016). Meanwhile, studies in less permissive environments suggest deterrent effects of mass repression (Byman, 2016; Lyall, 2009; García-Ponce and Wantchekon, 2011). Taken collectively, this literature yields a coherent set of results, once we appropriately account for underlying heterogeneity in retributive threats. Of course, we cannot rule out the possibility that divergent results are due to differences between the cases that are not captured in our framework – this is something that future research should investigate more thoroughly.

Our findings provide a needed synthesis of two previously disconnected literatures. Scholars of autocratic politics have long argued that threats of coercion can induce citizens to fabricate political loyalty – this is the essence of “preference falsification” (Kuran, 1995) and the “dictator’s dilemma” (Wintrobe, 1998). Surprisingly, the rich empirical literature on repression has not fully integrated these foundational ideas. As our evidence shows, these insights can potentially illuminate why the impact of repression varies so much.

“Terror by hunger” was an extreme form of repression, even by Soviet standards. Consequently, we can only speculate whether similar patterns might accompany other instances of indiscriminate mass terror. Previous studies suggest that some types of violence – mass executions, detentions, deportations – have effects consistent with at least part of the story that emerges here. Future research should examine more closely how historical legacies materialize, coalesce and change.

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