War and Nation-Building: Evidence from Ukraine*

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Abstract

How quickly and how deeply can violent conflict reshape national identity? We study this question in the context of Ukraine and the Russia–Ukraine war, using rich data spanning ethnic, linguistic, and cultural dimensions of identity. We document large and persistent shifts toward Ukrainian identity, alongside declines in Russian and mixed identities, following the conflict's onset in 2014 and Russia's full-scale invasion in 2022. In a series of nationally representative surveys, Ukrainian ethnic identification rises by about 9 percentage points after 2014 and by a further 6 percentage points after 2022. Consistent with national consolidation rather than polarization, the largest shifts occurred in districts with historically higher shares of ethnic Russians. Language use has evolved in parallel: changes after 2014 were modest, but after 2022 the share of respondents answering surveys in Ukrainian rises by roughly 20 percentage points, a pattern corroborated by within-user evidence from Twitter and Google search behavior. Cultural consumption and intergenerational choices also shifted sharply after 2022, toward Ukrainian cuisine, Ukrainian-language music, and traditionally more Ukrainian baby names. These patterns are not explained by compositional change or population displacement. Together, the results show that national identity is far more malleable than commonly assumed: large-scale violence can generate rapid, behaviorally meaningful, and broadly shared identity change, even among populations with substantial pre-war cultural and linguistic ties to the aggressor.

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"A common enemy is the best catalyst for forging a common identity."

— Yuval Noah Harari, 21 Lessons for the 21st Century

"Give people a common enemy, and you will give them a common identity. Deprive them of an enemy and you will deprive them of the crutch by which they know who they are."

— James Alison

Introduction

When Russia annexed Crimea in March 2014, both the Russian government and many Western analysts predicted that Ukraine's population—with nearly a third of the country reporting Russian as a native language[1]—would fracture along ethnolinguistic lines. Russian military and political strategy at the time was explicitly premised on such fragmentation, particularly in the country's eastern and southern regions. This paper asks whether these predictions were borne out. We show that, a decade later, the opposite pattern has emerged. Rather than fragmenting, Ukrainian national identity has consolidated, with the largest shifts occurring precisely in regions where ethnic Russians were most concentrated before the war. This consolidation intensified following Russia's full-scale invasion in 2022, generating especially large and persistent shifts across ethnic identification, language use, and cultural behavior.

This outcome matters beyond the Ukrainian case. National cohesion is a key determinant of public goods provision, the capacity to sustain collective defense, and long-run economic development (Rohner and Zhuravskaya, 2023). Yet whether armed conflict ultimately consolidates or fragments national identity remains theoretically ambiguous. In models of endogenous social identity (Shayo, 2009; Sambanis and

[1]State Statistics Committee of Ukraine, All-Ukrainian Population Census 2001, http://2001.ukrcensus.gov.ua/eng/results/general/language/.

Shayo, 2013), identification depends on the relative status of competing groups, the salience of different group boundaries, and individuals' perceived distance from group prototypes. External conflict can raise the salience and status of the nation, strengthening national identification (Sambanis et al., 2015). But it can also activate subnational cleavages—particularly when internal minorities are culturally close to the adversary—generating polarization instead (Shayo and Zussman, 2011). We develop a framework that organizes these forces and yields testable predictions about the conditions under which war produces nation-building rather than internal division.

Ukraine provides an especially sharp setting for studying the role of war in nation-building because, prior to 2014, polarization was unusually plausible. A substantial share of the population was ethnolinguistically close to the aggressor state: in 2012, roughly 30 percent reported some Russian ethnic identity, and a majority used Russian or a Russian–Ukrainian mix in daily communication. Political cleavages were also pronounced, with public opinion sharply divided over European integration and pro-Russian parties remaining electorally significant as late as 2021. Russian cultural and information products were widely consumed, further blurring national boundaries. Taken together, these features made Ukraine close to a knife-edge case: external aggression could have consolidated the nation, but it could also have activated preexisting ethnolinguistic cleavages and produced internal fragmentation. This ambiguity was not merely academic: Russian political and military strategy was premised on the expectation of local support in Russian-speaking regions, while many Western governments underestimated the scale of Ukrainian resistance (Boulègue et al., 2023).

This paper studies how two major conflict shocks—the onset of hostilities in 2014 and Russia's full-scale invasion in 2022—reshaped national identity in Ukraine. Our empirical strategy combines two complementary approaches. First, we exploit the large scale and unexpected nature of both shocks in a pre–post design to test whether national identity exhibits sharp breaks at conflict onset.[2] Second, we implement a

[2]We rely on substantial evidence—both historical and based on high-stakes economic and financial outcomes—that the 2014 war episode was largely unexpected (Treisman, 2018; Silva and Volkova, 2018; Korovkin and Makarin, 2023a; Korovkin et al., 2025). Although some Western governments

difference-in-differences design that leverages continuous variation in pre-war ethnolinguistic composition across districts, measured by the share of ethnic Russians in the 2001 Census.[3] This second approach directly distinguishes consolidation from polarization by testing whether identity shifts following conflict onset are larger or smaller in areas with stronger historical ties to Russia.

Across all outcomes, we find clear evidence of identity *consolidation* rather than *polarization*. Both conflict episodes generate sharp shifts toward Ukrainian national identity, and these shifts are systematically larger in regions where pre-war attachment to Ukrainian identity was weakest.

We begin by examining changes in ethnic identification. Following the onset of hostilities in 2014, identification as ethnically Ukrainian rises sharply by approximately 9 percentage points, accompanied by corresponding declines in mixed and Russian identities. After Russia's full-scale invasion in 2022, Ukrainian identification rises by a further 6 percentage points, reaching 95 percent and leaving only about 2.5 percent of respondents identifying as mixed or Russian. Consistent with national consolidation rather than polarization, these shifts are largest in districts with higher pre-war shares of ethnic Russians. Event-study estimates show sharp breaks at both conflict onsets and no differential pre-trends across districts, lending support to the identification assumptions underlying our pre-post and difference-in-differences designs.

We next turn to language use, a behavioral outcome whose adjustment requires effort and carries social and cognitive costs. Here the contrast between the two conflict episodes is especially stark. After 2014, changes in language use are modest. By contrast, the 2022 full-scale invasion triggers a large and abrupt shift toward Ukrainian, consistent with our framework's implication that costly behavioral adjustment should be greater when conflict creates stronger incentives to realign with the nation. In

anticipated the possibility of a 2022 invasion, the scale of the shock was nevertheless largely unexpected, as reflected in high-stakes outcomes such as stock-market reactions and the absence of stockpiling in Russia's imports of dual-use products (Federle et al., 2022; Egorov et al., 2025). As late as February 19, 2022, President Zelensky expressed skepticism about an imminent invasion (BBC News Russian, 2022).

[3]Results are unchanged if we instead use the share of Russian native speakers by district in the 2001 Census, the most recent census available for Ukraine.

survey interviews, the share of respondents answering in Ukrainian rises massively by approximately 20 percentage points following the invasion—a strikingly large shift for such costly behavioral margins. As with ethnic identification, these shifts are largest in regions with higher pre-war concentrations of ethnic Russians. Evidence from additional data sources corroborates this pattern and helps rule out compositional change or social desirability as primary explanations. Using the universe of original tweets from Ukraine, we document sharp increases in Ukrainian language use even when controlling for user fixed effects, thus isolating within-individual changes. Google search data show similar shifts toward Ukrainian-language queries, indicating that language change extends to private settings unlikely to be driven solely by interviewer effects or social desirability.

Cultural consumption, encompassing music, cuisine, and naming choices, provides further evidence that identity change extends to costly and persistent behaviors. Using Spotify's weekly Top-200 charts for Ukraine, we document a large and remarkably swift reorientation of music consumption toward Ukrainian-language content following the 2022 invasion. The share of Ukrainian-language songs rose from about 5 percent before the invasion to nearly 30 percent after it. Total weekly streams of songs in Russian dropped from around 7.8 million in the month before the invasion to around 3.2 million in three months; while streams of songs in Ukrainian increased from around 155 thousand to over 2 million.

Importantly, music consumption on Spotify is largely a private activity, and hence unlikely to reflect interviewer demand and social desirability effects. The shift in listening behavior persists through 2023-2025. Moreover, this shift reflects changes in both listener demand and artist behavior, and is unlikely to be driven by compositional change or population displacement.

Beyond music, we observe parallel reorientation in other everyday and durable choices. Searches increasingly favor Ukrainian over Russian cuisine, and parents become more likely to choose Ukrainian rather than Russian baby names. Together, these patterns show that conflict-induced identity change extends beyond stated

preferences and public-facing behavior to everyday private consumption decisions and long-lasting intergenerational choices.

Taken together, the results point to a broad-based and persistent shift toward Ukrainian national identity. Our conceptual framework suggests that this persistence reflects a self-reinforcing equilibrium: identification with the nation drives behavioral adjustment (e.g., language switching, consumption changes), which reduces individuals' distance from the Ukrainian prototype, which in turn strengthens identification. More broadly, they show that national identity is far more malleable than is often assumed: large-scale external violence can generate rapid, durable, and behaviorally meaningful identity change, even in historically heterogeneous societies with longstanding cultural and linguistic ties to the adversary.

This paper contributes to the literature on conflict and nation-building by examining whether external war consolidates or polarizes national identity in a heterogeneous society.[4] Existing work shows that conflict can have heterogeneous effects on political cohesion, identity, and social outcomes (Dell and Querubin, 2018; Dehdari and Gehring, 2022; Ananyev and Poyker, 2023). Our contribution is to provide a direct test of consolidation versus polarization within the same conflict setting. Exploiting continuous variation in pre-war ethnolinguistic composition, we show that identity shifts following external conflict are strongest precisely where pre-war attachment to the Ukrainian nation was weakest. We further show that these shifts extend to consumption behavior, linking conflict-induced identity change to economically meaningful outcomes.

The paper also contributes to the literature on national identity and nation-building by expanding both the scope and measurement of identity change. A growing body of work studies how policies, institutions, and historical shocks shape national identification and language use (Jha, 2013; Aghion et al., 2019; Bazzi et al., 2019; Fouka, 2020; Alesina et al., 2021; Assouad, 2025; Bazzi et al., 2025; Carlitz et al., 2025; see

[4]See Appendix A for an extensive review of the related literature. The relationship between war and nation-building has a long intellectual tradition, and we review relevant work across social sciences.

Rohner and Zhuravskaya, 2025 for a recent comprehensive overview), while theory emphasizes endogenous identity choice driven by similarity, status, and strategic incentives (Shayo, 2009; Sambanis and Shayo, 2013). Much of this literature relies on survey-based measures, leaving open concerns about social desirability and behavioral relevance. We address these concerns by combining surveys with private-action outcomes—music consumption, search behavior, and naming choices—that are costly, persistent, and less susceptible to reporting bias. Methodologically, our approach illustrates how integrating high-frequency surveys with large-scale digital traces can substantially strengthen inference about identity formation.[5]

The remainder of the paper is organized as follows. Section 1 develops a conceptual framework grounding our predictions in a model of endogenous social identity. Section 2 describes the Ukrainian context. Section 3 presents the data sources. Section 4 reports the empirical results for ethnic and linguistic identity. Section 5 examines cultural identity outcomes. Section 6 concludes.

1 Conceptual Framework

We ground our empirical analysis in a simple framework of endogenous social identity developed in Shayo (2009, 2020) and applied to conflict settings by Sambanis and Shayo (2013) and Sambanis et al. (2015).[6] We briefly present the key elements of the framework and derive predictions that map to our empirical analysis. For a detailed exposition, see Shayo (2020) and Gidron and Shayo (2026).

[5]Related work on the Russia–Ukraine war studies economic disruptions (Korovkin and Makarin, 2023b; Korovkin et al., 2025), refugee flows (Adema et al., 2024), and documents shifts in identity and language use following earlier phases of the conflict (Kulyk, 2016, 2018, 2024; Abramenko et al., 2024). Büyükeren (2025) shows that Ukraine's decentralization reforms boosted Ukrainian identity in rural areas. We complement this literature by providing unified evidence across both major conflict shocks, by directly testing consolidation versus polarization using granular within-country variation in pre-war ethnolinguistic composition made possible by newly accessed city-level KIIS data, and by showing that identity shifts extend beyond stated attitudes to private behavior and long-term choices.

[6]Hauk (2025) extends this framework to foreign interventions in divided societies. For broader reviews, see Genicot and Ray (2024) and Shayo (2020).

1.1 Identity Choice

Consider a resident of Ukraine who belongs to multiple social groups. The relevant competition in our setting is between two group identities: the *Ukrainian nation* (N) and a *Russian or Russian-leaning identity* (R). Identification with group $j \in \{N, R\}$ has two components. First, the individual cares about the group's *status*—i.e., its perceived esteem, success, or prestige—denoted S_j. Second, the individual seeks to minimize her perceived *distance* from the group's prototype, denoted d_{ij}. The utility that individual i derives from identifying with group j is

$$I_{ij} = (1 - \beta)\, S_j - \beta\, d_{ij}, \tag{1}$$

where $\beta \in [0, 1]$ governs the relative importance of conformity to group norms versus the pursuit of group status.

In a more general formulation, total utility is given by $U_i = \sum_{j \in G_i} \alpha_{ij} I_{ij}$, where α_{ij} denotes the weight placed on group j and $\sum_j \alpha_{ij} = 1$ (see Gidron and Shayo, 2026). For expositional clarity, we focus on the binary margin between identification with the Ukrainian nation (α_{iN}) and with a Russian or Russian-leaning identity (α_{iR}). We also abstract from material payoffs, which enter additively.

Perceived distance depends on how similar the individual is to the group's prototype along cognitively salient dimensions:

$$d_{ij} = \sum_k w_k \delta_k(i, j), \tag{2}$$

where $\delta_k(i, j)$ denotes the distance between individual i and group j's prototype along attribute k (e.g., ethnicity, language, or cultural practices), and $w_k \geq 0$ is the *attention weight* assigned to that dimension. Attention weights are endogenous: events can make particular attributes more salient, thereby increasing the weight they receive in perceived distance.

Identity is endogenous. An individual places more weight on Ukrainian national

identity when I_{iN} is high relative to I_{iR}. Three forces therefore govern identification choices: the *relative status* of the groups (S_N vs. S_R), the *salience* of different dimensions (w_k), and the individual's position in attribute space (which determines δ_k). This structure generates comparative statics that we take to the data.

1.2 How External War Shifts the Three Forces

We now apply this framework to an external war between Ukraine and Russia. The key insight is that the war's effect on national identity is not mechanical: it depends on how the conflict shifts status, salience, and perceived distance, which in turn depend on the war's nature and outcomes.

Status. Military resistance, and international recognition and solidarity, plausibly raise the perceived status of the Ukrainian nation (S_N). Russian military setbacks and international isolation plausibly lower the status associated with a Russian identity (S_R). If so, the higher relative national status increases the appeal of Ukrainian identification for all residents, but most consequentially for those initially on the margin: ethnolinguistically Russian Ukrainians who were previously closer to indifference between identities.

Critically, the status effects probably differ across the two conflict episodes. In 2014, Russia achieved its territorial objectives at low cost: Crimea was annexed without significant fighting, and proxy forces established control over parts of Donbas. Ukraine mobilized but did not reestablish control. Despite international condemnation (which was relatively limited and backed by few costly actions), Russia's swift territorial gains likely raised Russian status, while Ukrainian status was undermined by demonstrated military weakness. In contrast, the 2022 full-scale invasion plausibly produced the opposite dynamics: the failure of the Kyiv offensive, the unexpectedly effective Ukrainian resistance, and the strong international support (coupled in some cases with demonstrations of solidarity and admiration), would have raised Ukrainian status while lowering Russia's.

Salience. War increases the attention weight placed on the Ukraine–Russia boundary relative to internal ethnolinguistic dimensions. The critical distinction is between *inter-state* salience (Ukraine versus Russia) and *intra-state ethnic* salience (Ukrainian-speakers versus Russian-speakers within Ukraine). Russia's full-scale invasion attacked the country as a whole, targeting cities across the territory, including Russian-speaking ones, and explicitly denying the existence of a distinct Ukrainian nation. This made the interstate boundary the salient divide, thereby increasing perceived similarity among all Ukrainians (d_{iN} falls, especially for Russian speakers) while raising their perceived distance from Russia (d_{iR} rises). In principle, the same mechanism could instead have sharpened internal ethnolinguistic divisions under different patterns of exposure.[7]

Distance and behavioral adjustment. Identification with the nation induces conformity to national norms: switching to the Ukrainian language, consuming Ukrainian cultural products, choosing Ukrainian names. As we shall show, these behavioral adjustments are large and pervasive in the Ukrainian case. Thus, they are not merely consequences of identification: they also reduce the individual's distance from the Ukrainian prototype (d_{iN} falls), reinforcing the identification choice. This creates a feedback loop between identity and behavior that can generate persistent change even if the initial shock recedes and military successes stall.

1.3 Predictions

This framework yields three sets of predictions that guide the distinct features of our empirical analysis.

Prediction 1: Consolidation. Under the conditions of the Russia-Ukraine war—where the aggressor attacks the country as a whole and Ukrainian resistance raises national status—the framework predicts a broad shift toward Ukrainian identification, with the largest shifts occurring among those initially closest to the margin, i.e., in areas

[7] Again, the salience channel probably operated more weakly in 2014, when the conflict was geographically confined to Crimea and parts of Donbas rather than spanning the entire country. In 2022, with attacks reaching Kyiv, Kharkiv, Odesa, and other major cities across Ukraine, the interstate salience shock was substantially larger.

with higher pre-war shares of ethnic Russians. Consolidation means that districts with more ethnic Russians before the war converge toward the national mean; polarization would mean they diverge. We test this prediction in Section 4.

Prediction 2: Behavioral change. The shift toward Ukrainian identification should manifest not only in stated ethnic identification but also in identity-linked behaviors reflecting conformity to national norms: language use, cultural consumption, and naming choices. As discussed above, these behavioral adjustments in turn reduce perceived distance from the Ukrainian prototype, reinforcing the identification shift.

Prediction 3: Differential effects across episodes. The 2022 invasion differs from the 2014 conflict on both the status and salience margins. In 2014, the salience channel favors consolidation, but the status channel probably works against it (Russian territorial gains, Ukrainian military setbacks). In 2022, both channels reinforce each other. The framework therefore predicts larger identity shifts after 2022 than after 2014, with the differential particularly pronounced for behaviors that are more costly to adjust, such as language use.

1.4 Persistence and Contingency

The comparative statics above take status and salience as given. In practice, however, identity and behavior may reinforce one another. Conflict-induced shifts toward national identification may induce behavioral adjustment—such as switching to Ukrainian or reducing consumption of Russian cultural products—that brings individuals closer to the Ukrainian prototype and may therefore sustain the initial identity shift over time. In addition, stronger national identification may itself increase willingness to resist and mobilize, further reinforcing national status and consolidation.

More broadly, the framework implies that the effects of war on identity depend on how conflict reshapes status, salience, and perceived distance. In Ukraine, the combination of indiscriminate external attack, failed Russian blitzkrieg, effective resistance, and international support likely shifted these forces in favor of national consolidation. However, under different military and political conditions, the same underlying forces

could instead have produced polarization rather than nation-building.[8]

2 Ukrainian Context

2.1 Ethnic and Linguistic Identity in Ukraine

In the Ukrainian context, the Soviet concept of "nationality" is commonly used in place of ethnicity, as reflected in the 2001 census and in the surveys we analyze. Under Soviet rule, nationality was determined by parental origin and recorded as a mandatory attribute in civil passports. This legacy renders contemporary self-reported nationality in Ukraine conceptually broader than ethnicity alone: changes may reflect a shift in identification weights—placing more weight on Ukrainian identity (α_{iN}) relative to Russian identity (α_{iR})—or a change in the attention weights w_k, with ethnicity becoming less salient relative to citizenship as a dimension of self-categorization (Barrington, 2018; Kulyk, 2018). Throughout the paper, we therefore use the terms ethnicity and nationality interchangeably, while recognizing this conceptual overlap. Because Ukrainian citizenship is largely invariant for individuals in our sample, these two channels are observationally equivalent in our setting.

High rates of ethnic intermarriage in Ukraine (25% in 1989; Rapawy, 1997), particularly in the east and south, contribute to the fluidity of ethnic identification, making Ukraine a fertile setting for identity change (Jia and Persson, 2021).

Language complicates matters further. During the late 19th and 20th centuries, Russification shaped education, media, and public life (Kravtsiv and Kubijovyc, 1993). The Valuev Circular (1863) banned most Ukrainian-language publications; the Ems Ukaz (1876) extended these restrictions to schools and theater (Subtelny, 2009, 282–84). Yet Ukrainian remained the predominant spoken language in rural areas and retained

[8] A suggestive mirror-image case is Crimea after 2014. Russia's swift annexation occurred in a region already much closer to the Russian prototype: in the 2001 Ukrainian Census, ethnic Russians constituted 58% of Crimea's population and 71% of Sevastopol's, while 79% of residents reported Russian as their mother tongue. Ukrainian resistance was largely absent and the interstate salience shock was more limited. Available evidence, though imperfect and difficult to interpret under occupation, is broadly consistent with identity moving in the opposite direction from what we observe in government-controlled Ukraine. We therefore treat Crimea as illustrative rather than as part of the paper's core empirical analysis.

its vitality as a marker of local identity (Magocsi, 1996, 479–480). After 1917, early Soviet Ukrainization briefly reversed the trend: by 1929, over 80% of schools taught in Ukrainian (Subtelny, 2009, 389–90). Stalin's reversal in 1933 ended this interlude (Subtelny, 2009, 422).

The subsequent decades deepened Ukraine's linguistic Russification. The Holodomor (1932–33) and World War II sharply reduced Ukraine's population, and large-scale resettlement of Russians into the republic transformed its ethnic balance (Subtelny, 2009, 415–16, 480–85; Markevich et al., 2025). By the Brezhnev era, Russian language had become the key to mobility and higher education, while Ukrainian publishing shrank: the share of books in Ukrainian fell from 60% to 24% from 1958 through 1980 (Subtelny, 2009, 536).[9]

As a result, numerous ethnic Ukrainians adopted Russian as their primary language. The share of Ukrainians in the USSR who reported Ukrainian as their native tongue fell from 87.7% in 1959 to 81.1% in 1989. Even after independence, Russian remained prevalent in media, education, and daily communication. According to the 2001 Census, 87.8% of the population were fluent in Ukrainian and 67.7% in Russian.[10] With the onset of the conflict, linguistic ties to Russia may have increasingly been perceived, particularly among Russian speakers, as a potential security liability, given that Moscow invoked the need to "protect" Russian speakers to justify aggression (Monde, 2024).

In Ukraine, nationality and language are less tightly aligned than in most European nation-states (see, e.g., Kulyk and Hale, 2022). Following Arel and Khmelko (1996), it is therefore useful to distinguish three broad ethnolinguistic groups: Ukrainian-speaking Ukrainians, Russian-speaking Ukrainians, and predominantly Russian-speaking ethnic Russians. Before the war, Ukrainian-speaking Ukrainians were already well on the Ukrainian side of the identification margin, while the latter two groups were closer to

[9] Another dimension of this linguistic landscape is *Surzhyk*, a mixed Ukrainian–Russian vernacular long stigmatized as "incorrect" speech. Since the 2022 invasion, Surzhyk has seen a revival, with many Ukrainians embracing it as an inclusive marker of identity (Osypenko, 2025).

[10] State Statistics Committee of Ukraine, All-Ukrainian Population Census 2001, http://2001.ukrcensus.gov.ua/eng/results/general/language/.

indifference between N and R, or on the Russian side of it.

Two considerations are central for interpreting identity responses to the war. First, conflict could plausibly push identity in either direction. On the one hand, external aggression may strengthen attachment to the Ukrainian nation. On the other hand, Russian political narratives explicitly denied the existence of a distinct Ukrainian nation and sought to activate subnational identities among Russian-speaking Ukrainians, especially in the east and south, through appeals to shared origins and claims of linguistic repression (Bækken, 2024). Second, ethnolinguistic identity and language use vary sharply across space: Russian nationality and language are more prevalent closer to Russia and the Black Sea, while Ukrainian identification and language use increase along an east–west gradient. This geographic structure makes regional patterns of change in nationality and language informative about which groups drive aggregate identity shifts, a feature we exploit in our empirical analysis.

2.2 A Brief Account of the Russia–Ukraine War (2014–24)

The Outbreak (2014–15). Mass protests began in Ukraine in November 2013 after President Yanukovych declined to sign the EU–Ukraine Association Agreement. By February 2014, the protests culminated in a change of government, with President Yanukovych leaving the country and the Verkhovna Rada assuming executive authority. In March 2014, Russia annexed Crimea following the deployment of armed forces and a local referendum that was not internationally recognized. Shortly thereafter, armed groups seized administrative buildings in parts of the Donetsk and Luhansk regions and proclaimed the establishment of "people's republics." Although the Russian government denied direct involvement, multiple investigations documented the presence of Russian nationals and regular military units in key engagements, including Ilovaisk and Debaltseve. Ukraine mobilized its armed forces but did not reestablish control over these territories (Plokhy, 2015, chap. 27; D'Anieri, 2023, chap. 7).

A Frozen Conflict (2015–22). In February 2015, Ukraine, Russia, and representatives of the self-proclaimed separatist authorities signed the Minsk II agreement, which es-

tablished a ceasefire but left core political and territorial issues unresolved. Following the agreement, Russian-backed separatists retained control over roughly one-third of the Donetsk and Luhansk oblasts, including their regional capitals. While large-scale fighting subsided, low-intensity violence—including shelling, sniper fire, and periodic escalations—continued throughout the period, resulting in ongoing military and civilian casualties, albeit at substantially lower rates than in 2014–15. Implementation of the Minsk framework stalled, and the frontline remained largely unchanged, producing a prolonged frozen conflict (Plokhy, 2015, chap. 27; D'Anieri, 2023, chap. 8).

The Full-Scale Invasion (2022–2026). On 24 February 2022, Russia launched a full-scale invasion of Ukraine. Military operations initially targeted Kyiv and other major cities, but by April 2022 Russian forces withdrew from northern Ukraine following sustained Ukrainian resistance. The war subsequently shifted to the east and south, where Russian forces occupied additional territory in Donetsk and Luhansk oblasts and advanced into Zaporizhzhia and Kherson oblasts. In late 2022, Russia formally claimed the entirety of all four oblasts as its territory, despite not exercising full control over them. Ukrainian counteroffensives later that year recaptured most of Kharkiv oblast and the city of Kherson, while subsequent operations in 2023 produced more limited territorial changes. By 2024, the conflict had largely transitioned into a war of attrition characterized by sustained fighting along established lines, with Russia making gradual territorial advances (D'Anieri, 2023, chap. 9; CFR, 2024).

Consequences of the War. The conflict has had large economic and demographic consequences. The 2014 hostilities led to a substantial contraction of economic activity, on the order of 20–50 percent, in separatist-controlled areas (Kochnev, 2019), as well as additional losses of about 6–7 percent in non-conflict areas due to the disruption of domestic production networks and Russia–Ukraine trade (Korovkin and Makarin, 2023b; Korovkin et al., 2025). Following the 2022 full-scale invasion, Ukraine's GDP declined by approximately 31 percent (Federle et al., 2024). The war has also resulted

in severe human losses: according to the Center for Strategic and International Studies, by late 2025, cumulative casualties were estimated at roughly 400,000 Ukrainians and one million Russians (Mayer et al., 2026). Population displacement has been extensive, with about 3.6 million Ukrainians internally displaced and an additional 6.8 million seeking refuge abroad, primarily in the European Union. In parallel, military strikes have damaged critical infrastructure, including energy systems and transport networks (CFR, 2024; UN High Commissioner for Refugees, 2025). While the war's cultural and identity consequences have attracted descriptive attention, there is still little systematic quantitative evidence on their magnitude, persistence, and behavioral reach; our paper seeks to fill that gap.

3 Data

To quantify the cultural and identity responses to the war episodes, we combine repeated quarterly surveys of the Ukrainian population with administrative data and digital records of language use and consumption. The surveys provide direct measures of ethnic identification and language choice, while the other datasets capture revealed behavior in private or high-stakes settings that are less susceptible to reporting or interviewer effects.

3.1 Survey Data: KIIS Omnibus Surveys

Our primary data source on ethnic identification and language choice is the omnibus survey conducted by the Kyiv International Institute of Sociology (KIIS). We use 72 survey waves fielded quarterly between 2008 and 2024, comprising more than 156,000 respondents. Each wave is designed to be nationally representative of the adult population residing in government-controlled territories at the time of the survey.

The surveys contain rich information on respondents' demographic characteristics, place of residence, ethnic self-identification ("nationality"), and language use. Crucially for our analysis, we obtained access to restricted KIIS records that identify respondents' city or settlement of residence, allowing us to link individuals to pre-war local ethnolinguistic composition at a fine geographic level. This feature enables

within-country heterogeneity analysis that is not possible using the coarser regional identifiers available in publicly released KIIS data.

We focus on three survey-based identity outcomes that are consistently available over time. First, respondents answer an open-ended question on self-reported nationality. Second, for respondents identifying as Ukrainian and/or Russian, the survey includes an ordered five-point nationality scale (available through early 2022) that captures mixed and intermediate identities. Third, interviewers record the language of the interview (Ukrainian, Russian, or mixed) following a standardized protocol in which respondents choose the language in which they feel most comfortable. This measure reflects revealed linguistic choice in a low-stakes interaction rather than a direct attitudinal response.

Further details on the data and the exact wording of the ethnic and linguistic identity questions are provided in Appendix B.1.

3.2 Twitter Data: Public Language Use

To measure public linguistic behavior at high frequency and within individuals, we use the universe of original (non-retweeted) tweets geolocated to Ukraine between January 2012 and November 2022, comprising approximately 36 million tweets. Language is identified using Twitter's built-in language classifier, which performs comparably to standard open-source tools. While geotagging became less common over time, the number of precisely located tweets remained broadly representative in terms of user composition and linguistic behavior. See Abramenko et al. (2024) for further details.

We exploit user identifiers to estimate specifications with account fixed effects, so identification comes from within-user changes in language choice over time. This design rules out changes driven by shifts in the composition of users and provides a behavioral validation of the survey evidence in a public communication setting.

3.3 Google Search Data: Private Language Use and Consumption

We complement survey and social media evidence with Google Trends data, which capture private information-seeking behavior. Because search activity is typically pri-

vate and not interviewer-mediated, these data are less susceptible to social desirability or strategic reporting concerns. In 2021, Google was overwhelmingly the most popular search engine in Ukraine, accounting for over 88% of total search engine market share across all platforms.[11]

We use Google Trends to measure two dimensions of identity-related behavior. First, we construct quarterly region-level measures of the relative use of Ukrainian versus Russian in search queries from 2012 to 2025. These measures are based on pairs of Ukrainian and Russian spellings of the same words and capture revealed language choice in private settings (see Appendix B.2.1 for details).

Second, we use search activity to study cultural consumption, focusing on interest in national cuisine. We assemble an oblast-by-month panel of search intensity for major Ukrainian and Russian dishes from 2012 to 2024 and examine whether interest shifts differentially toward dishes more strongly associated with Ukrainian culture following the war (see Appendix B.2.2 for details).

In both applications, identification relies on within-region changes over time and exploits sharp breaks at the onset of hostilities in 2014 and the 2022 invasion.

3.4 Baby Names: Intergenerational Identity

To capture durable intergenerational identity choices, we use administrative data from the Ukrainian Ministry of Justice on popular baby names by region and half-year from 2015 onward. Each name is assigned a time-invariant "Ukrainianness" score based on its relative pre-war prevalence in Ukraine versus Russia, using data from *forebears.io*. We then study whether the popularity of more Ukrainian names, relative to more Russian ones, changes after the 2022 invasion, controlling for region-by-time fixed effects. See Appendix B.2.3 for additional details.

3.5 Music Consumption: Spotify Charts

Finally, we analyze cultural consumption through the lens of popular music. Our analysis combines four complementary data sources. First, we use Spotify Weekly

[11] StatCounter Global Stats, "Search Engine Market Share in Ukraine (2021)," available at https://gs.statcounter.com/search-engine-market-share/all/ukraine/2021.

Top-200 charts for Ukraine from July 2020 to August 2025, scraped from Kworb, which provide weekly chart positions and streaming counts for all ranked tracks. Second, we collect song-level metadata, including release dates and artist information, from the Spotify Web API. Third, we retrieve song lyrics from Genius through its API and use automated language detection to classify tracks by language. Fourth, for the supply-side analysis, we construct a comprehensive catalogue of Ukrainian artists by combining curated lists from NUAM Club, Spotify, and Wikipedia, and then retrieve their full discographies from Genius.

The final dataset contains 3,850 distinct charting tracks performed by 572 artists, together with song-level information on language, release date, chart trajectory, and total streams. This structure allows us to document the overall shift in music consumption, isolate demand-side changes by focusing on the chart performance of pre-war releases, and identify supply-side adjustments in language choice among Ukrainian artists. Additional details are provided in Appendix B.2.4.

3.6 Pre-War Ethnolinguistic Composition

To measure pre-existing cultural proximity to Russia, we use district-level ethnolinguistic composition from the 2001 Ukrainian Census, the most recent census available. Our main measure is the share of residents in each pre-2020 district (rayon) who report Russian ethnicity. In robustness checks available upon request, we alternatively use the share of Russian native speakers, with similar results.

Ukraine's 2020 administrative reform consolidated districts into a smaller number of larger units. To preserve a consistent measure of treatment intensity, we map post-2020 survey respondents back to their corresponding pre-reform districts and use the 2001 composition measure throughout. This approach allows us to combine pre-war ethnolinguistic composition with contemporaneous district fixed effects and clustered standard errors. See Appendix B.3 for additional details.

3.7 Population Displacement and Local Controls

To address concerns about compositional change due to migration and displacement, we incorporate data on internally displaced persons (IDPs). We use oblast-level IDP statistics from the Ukrainian Ministry of Social Policy for 2014–2019 and district-level data for 2020 onward, adjusting for administrative changes. For the period following the 2022 full-scale invasion, we rely on district-level IDP dynamics from the International Organization for Migration (IOM). These measures allow us to control for local displacement intensity and to assess robustness to migration-related selection. See Appendix B.4 for further details.

We further merge time-varying local economic controls, including regional GDP per capita and consumer price indices, from the State Statistics Service of Ukraine.

4 Results: Ethnic and Linguistic Identity

We begin by examining whether the 2014 conflict and the 2022 full-scale invasion consolidated Ukrainian national identity or instead polarized the population along ethnolinguistic lines. We first present survey-based evidence on ethnic self-identification and interview language, which provide direct measures of identity and its behavioral expression. We then turn to Twitter and Google search data to assess whether the same patterns extend beyond the survey setting to within-user changes in changes in public language use and to language choice in private settings.

4.1 Baseline Outcomes: Ethnicity and Language in the KIIS Survey

We start with repeated cross-sectional data from the Kyiv International Institute of Sociology (KIIS), covering 2008–2024. These data allow us to trace how respondents' ethnic identification and interview language changed around the two major phases of the war. This analysis provides an initial test of Predictions 1 and 3 from Section 1: consolidation in both episodes, with larger shifts after 2022 than after 2014.

4.1.1 *Empirical Strategy*

We proceed in two steps. First, we document raw time dynamics of reported nationality and interview language before and after each conflict episode. Second, we estimate difference-in-differences specifications that exploit pre-war cross-sectional variation in local ethnic composition. Specifically, we ask whether districts with larger pre-war Russian minorities exhibit weaker or stronger shifts toward Ukrainian identity following each conflict shock.

To estimate average post-war changes in identity outcomes, we first estimate the following pre–post specification:

$$\text{Identity}_{irt} = \beta \, \text{PostWar}_t + X'_{irt}\delta + \alpha_r + \varepsilon_{irt}. \tag{3}$$

We then examine heterogeneity in these shifts by local ethnic composition using a difference-in-differences specification:

$$\text{Identity}_{irt} = \beta \left(\text{PostWar}_t \times \text{EthnicRussians}_{r,2001}\right) + X'_{irt}\delta + \alpha_r + \gamma_t + \varepsilon_{irt}. \tag{4}$$

In both equations, Identity_{irt} denotes one of three outcomes: (i) an indicator for identifying as *only Ukrainian* (versus mixed or Russian) in the 2014 analysis; (ii) an indicator for identifying as Ukrainian in the 2022 analysis; or (iii) an indicator for responding in Ukrainian (or mixed Ukrainian/Russian) rather than exclusively in Russian. In the 2014 analysis, PostWar_t equals one for survey waves after February 2014 and zero otherwise; in the 2022 analysis, it equals one for survey waves after February 2022 and zero otherwise. $\text{EthnicRussians}_{r,2001}$ is the pre-determined share of ethnic Russians in rayon r from the 2001 Census. X_{irt} denotes individual- and locality-level controls, while α_r and γ_t are rayon and survey-wave fixed effects, respectively. For the 2022 analysis, rayons are assigned based on respondents' pre-invasion place of residence as recorded in the survey. Standard errors are clustered at the rayon level.

In Equation (3), the coefficient β captures the average change in identity outcomes

after each conflict episode. Identification requires that, absent the conflict, average identity outcomes within rayons would have remained stable over time, conditional on controls and fixed effects that account for compositional change. This assumption is plausible because both episodes were abrupt shocks: the 2014 onset of hostilities was largely unexpected (Treisman, 2018; Silva and Volkova, 2018; Korovkin and Makarin, 2023a; Korovkin et al., 2025), and although some Western governments anticipated the possibility of a 2022 invasion, the scale of that shock appears to have been largely unanticipated (Federle et al., 2022; Egorov et al., 2025).

In Equation (4), the coefficient β captures whether post-conflict identity shifts vary systematically with pre-war Russian ethnic presence. Identification relies on a parallel-trends assumption: absent the conflict, rayons with different pre-existing shares of ethnic Russians would have experienced similar changes in identity outcomes. Positive estimates ($\beta > 0$) imply stronger shifts toward Ukrainian identity in historically more Russian areas, which we interpret as evidence of *consolidation*; negative estimates ($\beta < 0$) imply the opposite and are consistent with *polarization*. We assess the credibility of this assumption by examining pre-conflict trends in event-study specifications.

Controls. We include several covariates to address compositional change and local economic conditions. To account for changes in respondent composition, we control for sex, age, and educational attainment, as well as an indicator for urban versus rural residence. In analyses of the post-2014 conflict, we additionally control for local displacement intensity, measured as the rayon-level ratio of internally displaced persons (IDPs) to population. For the 2022 event, we observe respondents' displacement status directly and include an indicator for individual displacement. To account for time-varying economic conditions, we merge region-by-time measures of real GDP per capita and the consumer price index (CPI) to each respondent.

4.1.2 *The 2014 War*

Ethnicity. We begin by estimating post-2014 changes in ethnic self-identification using Equation (3). Columns (1)–(2) of Panel A of Table 1 show a large aggregate shift toward Ukrainian ethnic identification. The unconditional post-2014 increase amounts to approximately 8.9 percentage points. Once individual- and rayon-level controls are included, the estimate declines to 3.8 percentage points but remains statistically significant, indicating that part of the aggregate shift is correlated with contemporaneous changes in local economic conditions.

We next turn to the difference-in-differences specification in Equation (4). Columns (1)–(2) of Panel B of Table 1 provide strong evidence of identity consolidation: the increase in exclusive Ukrainian identification is substantially larger in rayons with higher pre-war shares of ethnic Russians. The interaction term *Post 2014* $\times$ *Share of Ethnic Russians* is positive and highly significant. Quantitatively, moving a respondent from a district with 0% to a district with 25% ethnic Russians increases the probability of identifying as *only Ukrainian* after the 2014 conflict by about 14 percentage points.

Panel A of Figure 1 presents event-study estimates from a wave-by-wave version of Equation (4), with exclusive Ukrainian identification as the outcome. The estimates are flat before February 2014, rise thereafter, and remain elevated throughout the post-conflict period, with no evidence of differential pre-trends.

Finally, Table C.1 extends both the pre–post and difference-in-differences analyses to the full Likert scale of ethnic identity. The results show that the rise in exclusive Ukrainian identification comes at the expense of Russian and mixed identities.[12]

Language. Columns (3)–(4) of Panel A of Table 1 report analogous results for the language of interview. Following 2014, the share of respondents not replying in

[12]These patterns are also visible in the raw data. Figure C.1 plots mean shares of reported ethnicity before and after the onset of the 2014 conflict, showing a ten percentage point increase in exclusive Ukrainian identification and corresponding declines in mixed and Russian identities. Figure C.2 plots before–after changes in ethnic identification by pre-war Russian population share, with larger shifts in areas with higher Russian minority shares.

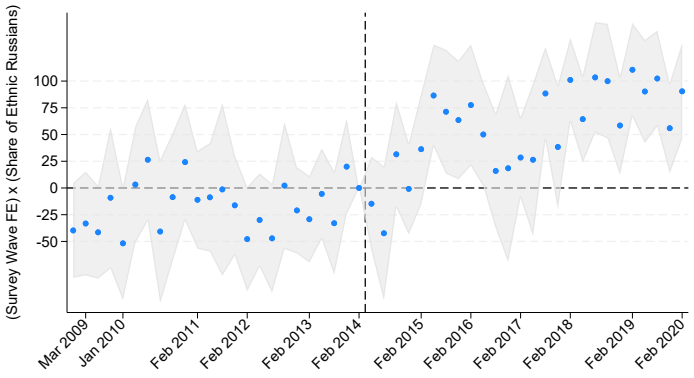
Table 1: The Effect of 2014 War on the National Identity of Ukrainian Citizens

	Identified As Ukrainian Only (%)		Replied Not In Russian (%)	
	(1)	(2)	(3)	(4)
Panel A: Post-war shift				
Post-February 2014	8.896***	3.753**	2.122**	0.756
	(1.309)	(1.527)	(0.923)	(2.042)
Controls		✓		✓
Rayon FE	✓	✓	✓	✓
Panel B: Difference-in-differences				
Post-February 2014 × share of ethnic Russians	71.038***	55.669***	16.215***	13.914**
	(9.090)	(11.594)	(4.525)	(5.808)
Dependent variable mean	79.757	79.782	60.780	60.761
Dependent variable st. dev.	40.181	40.163	48.824	48.829
Observations	87,751	87,272	95,666	95,117
Controls		✓		✓
Rayon FE	✓	✓	✓	✓
Wave FE	✓	✓	✓	✓

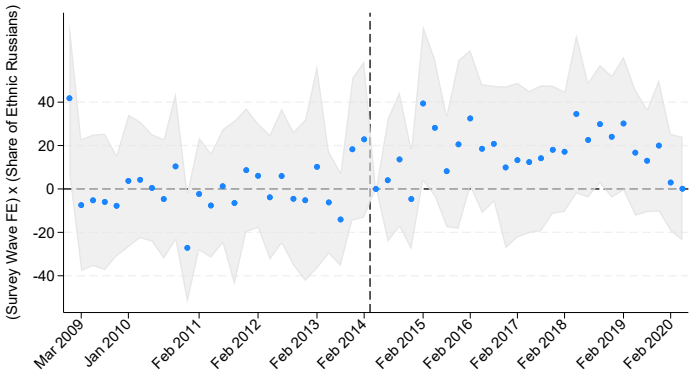
Notes: This table reports regression estimates of ethnic and linguistic identity outcomes on a post-February 2014 indicator and its interaction with pre-war local ethnic composition, testing the consolidation hypothesis. Dependent variables are indicator variables multiplied by 100; coefficients are in percentage points. In columns (1)–(2), the dependent variable equals one if the respondent identifies exclusively as Ukrainian, rather than as Russian or mixed. In columns (3)–(4), it equals one if the interview was conducted in a language other than Russian (Ukrainian or mixed Ukrainian–Russian). Panel A reports coefficients on an indicator equal to one for interviews conducted after February 2014. Panel B reports coefficients on *Post-February 2014 × share of ethnic Russians*, where the share is measured at the district level (pre-2020 rayons and cities of regional significance) using the 2001 Census. All specifications include district fixed effects; Panel B specifications additionally include survey-wave fixed effects. Panel A specifications omit wave fixed effects because they would absorb the post-February 2014 indicator. Columns (2) and (4) additionally control for sex, age, education, an urban/rural indicator, district-level internally displaced persons inflows per population, regional GDP per capita, and the CPI. Dependent variable summary statistics and numbers of observations are identical across the panels. Standard errors in parentheses are clustered at the district level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Russian and instead replying in Ukrainian or a Ukrainian–Russian mix increases by roughly two percentage points. However, once individual- and rayon-level controls are included, the aggregate post-2014 shift is no longer statistically significant.

In contrast, the difference-in-differences results for language choice mirror the ethnicity findings. Columns (3)–(4) of Panel B of Table 1 and Table C.2 show that the shift away from Russian is significantly stronger in rayons with higher pre-war shares



(a) Ethnicity (Ukrainian only)



(b) Language (not replying in Russian)

Figure 1: The 2014 War: Event-Study by Pre-War Ethnic Composition

Notes: The figure plots event-study coefficients from a regression of the indicated identity outcome on survey-wave indicators interacted with the pre-war share of ethnic Russians in the respondent's district, measured in the 2001 Census (Equation (4)). In Panel A the outcome is an indicator for reporting exclusively Ukrainian ethnicity; in Panel B the outcome is an indicator for replying in a language other than Russian (Ukrainian or mixed Ukrainian–Russian). In both panels, positive post-2014 coefficients indicate relatively larger increases in Ukrainian identification and non-Russian replies in districts with higher pre-war shares of ethnic Russians, consistent with consolidation rather than polarization. Coefficients are normalized relative to the February 2014 survey wave, completed prior to the annexation of Crimea. The vertical line marks the onset of hostilities in late February 2014. The sample excludes Crimea and districts that were fully or partially occupied after 2014. Standard errors are clustered at the district level. Shaded areas indicate 95% confidence intervals.

of ethnic Russians. The interaction term *Post 2014* × *Share of Ethnic Russians* is positive and statistically significant, with stable magnitudes across specifications both with and without controls. Quantitatively, moving a respondent from a district with 0% to a district with 25% ethnic Russians increases the probability of not replying in Russian

after the 2014 conflict by approximately 3.5 percentage points.[13]

Event-study estimates in Panel B of Figure 1 show no evidence of differential pre-trends and a persistent increase after February 2014, although the estimates are relatively noisy and not always statistically distinguishable from zero.

Taken together, the results so far reveal a divergence between identity and language adjustment in the immediate aftermath of the 2014 conflict: ethnic self-identification responds sharply, while language use adjusts more gradually. This pattern is consistent with our conceptual framework: in 2014, the salience channel favors consolidation but the status channel likely works against it, producing a weaker net force. As a result, self-reported ethnicity, which requires little behavioral adjustment, responds even to this more moderate shock, whereas language use—a costlier and more behaviorally demanding margin—adjusts less. At the same time, both outcomes move in a direction consistent with national consolidation. The full-scale invasion of 2022 provides a natural setting to examine whether a stronger war shock, in which both channels reinforce each other, may lead to broader linguistic realignment.

4.1.3 The 2022 War

Ethnicity. We now turn to the 2022 full-scale invasion. In the post-invasion waves, KIIS no longer includes the five-category ethnic identity question used in the earlier period. We therefore use the survey's direct measure of nationality, which records whether respondents identify as Ukrainian, Russian, or mixed Ukrainian–Russian.

Columns (1)–(2) of Panel A of Table 2 document a large aggregate shift toward Ukrainian ethnic identification after February 2022, amounting to 5.6–5.9 percentage points. Columns (1)–(2) of Panel B of Table 2 show that this shift is significantly stronger in rayons with higher pre-war shares of ethnic Russians: the interaction term

[13] Figure C.3 reports raw before–after changes in interview language by pre-war Russian population share. The figure shows an increase in Ukrainian-language responses relative to mixed Surzhyk following the 2014 conflict, concentrated in rayons with lower Russian minority shares. In rayons with higher Russian minority shares, the adjustment occurs primarily through a shift from Russian to mixed Surzhyk rather than to exclusively Ukrainian.

Post 2022 $\times$ *Share of Ethnic Russians* is positive and highly significant, and remains robust to the inclusion of controls in column (2). Quantitatively, moving from a rayon with 0% ethnic Russians to one with 25% ethnic Russians in the 2001 Census is associated with an approximately 10 percentage-point higher probability of identifying as Ukrainian. Event-study estimates in Panel A of Figure 2 are flat prior to early 2022 and rise sharply thereafter, with no evidence of reversion through 2024.[14]

Taken together, these patterns point to national consolidation rather than polarization following the 2022 invasion, echoing the pattern observed after the 2014 conflict.

Language. Figure C.5 documents one of the most striking shifts in our data. Following February 2022, the share of respondents replying in Ukrainian or a Ukrainian-Russian mix increases by approximately 20 percentage points, mirrored by a comparable decline in Russian. In other words, roughly one-fifth of respondents switch the language of interview after the invasion. Columns (3)–(4) of Panel A of Table 2 confirm the magnitude of this shift in a regression framework, with and without controls.

Consistent with earlier findings, the shift is strongest in rayons with higher pre-war shares of ethnic Russians, reinforcing the interpretation of the invasion as inducing national consolidation rather than ethnic polarization. Columns (3)–(4) of Panel B of Table 2 confirm this heterogeneity pattern. Table C.3 further shows that the adjustment occurs primarily through movement from Russian to Ukrainian, rather than through mixed-language responses. The interaction term *Post 2022* $\times$ *Share of Ethnic Russians* is large, positive, and robust to the inclusion of controls in column (4): moving from 0% to 25% ethnic Russians increases the probability of not replying in Russian by approximately 22 percentage points.

Event-study estimates in Panel B of Figure 2 display an immediate break at the onset of the war that remains elevated throughout the post-invasion period, with no evidence of differential pre-trends or subsequent reversal.

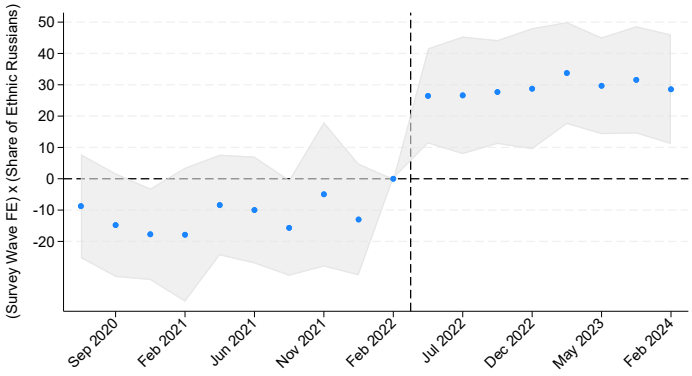
[14] Figure C.4 reports raw mean changes in reported nationality before and after the invasion. The share identifying as Ukrainian increases by about six percentage points, while mixed and Russian identities decline sharply, together accounting for only 2.5% of respondents after 2022.

Table 2: The Effect of 2022 Invasion on the National Identity of Ukrainian Citizens

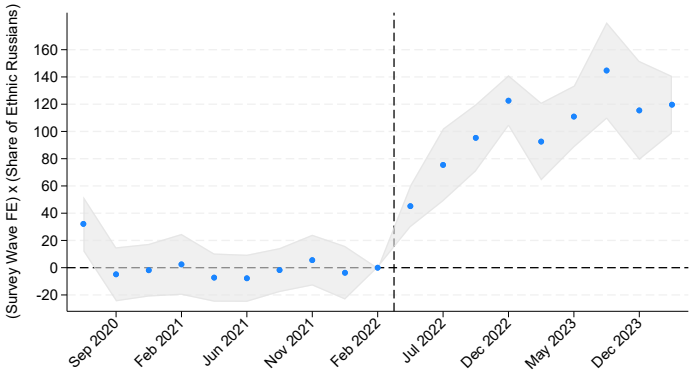
	Identified As Ukrainian (%)		Replied Not In Russian (%)	
	(1)	(2)	(3)	(4)
Panel A: Post-war shift				
Post-February 2022	5.867***	5.640***	21.180***	19.708***
	(0.682)	(0.675)	(1.809)	(1.837)
Controls		✓		✓
Rayon FE	✓	✓	✓	✓
Panel B: Difference-in-differences				
Post-February 2022 × share of ethnic Russians	41.641***	39.226***	95.036***	88.406***
	(3.391)	(3.006)	(8.354)	(9.321)
Dependent variable mean	92.254	92.251	69.675	69.652
Dependent variable st. dev.	26.732	26.736	45.967	45.977
Observations	50,673	50,512	48,976	48,744
Controls		✓		✓
Rayon FE	✓	✓	✓	✓
Wave FE	✓	✓	✓	✓

Notes: This table reports regression estimates of ethnic and linguistic identity outcomes on a post-February 2022 indicator and its interaction with pre-war local ethnic composition, testing the consolidation hypothesis. Dependent variables are indicator variables multiplied by 100; coefficients are in percentage points. In columns (1)–(2), the dependent variable equals one if the respondent identifies as ethnically Ukrainian. In columns (3)–(4), it equals one if the interview was conducted in a language other than Russian (Ukrainian or mixed Ukrainian–Russian). Panel A reports coefficients on an indicator equal to one for interviews conducted after February 2022. Panel B reports coefficients on *Post-February 2022 × share of ethnic Russians*, where the share is measured at the district level (pre-2020 rayons and cities of regional significance) using the 2001 Census. All specifications include district fixed effects (post-2020 rayons); Panel B specifications additionally include survey-wave fixed effects. Panel A specifications omit wave fixed effects because they would absorb the post-February 2022 indicator. Columns (2) and (4) additionally control for sex, age, education, an urban/rural indicator, pre-2020 district level share of ethnic Russians, and an indicator for being internally displaced interacted with the survey-wave identifier. Dependent variable summary statistics and numbers of observations are identical across the panels. Standard errors in parentheses are clustered at the district level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Taken together, the evidence from 2014 and 2022 points to a consistent pattern of national consolidation across conflict episodes, but with different margins of adjustment. Following the 2014 conflict, shifts are concentrated in ethnic self-identification, while changes in language use are more muted. In contrast, the 2022 invasion generates large and immediate adjustments along both dimensions, with particularly pronounced changes in language use. We interpret this cross-episode contrast in light



(a) Ethnicity (Ukrainian)



(b) Language (not replying in Russian)

Figure 2: The 2022 Invasion: Event-Study by Pre-War Ethnic Composition

Notes: The figure plots event-study coefficients from a regression of the indicated identity outcome on survey-wave indicators interacted with the pre-war share of ethnic Russians in the respondent's pre-2020 district, measured in the 2001 Census (Equation (4)). In Panel A the outcome is an indicator for reporting Ukrainian ethnicity; in Panel B the outcome is an indicator for replying in a language other than Russian (Ukrainian or mixed Ukrainian–Russian). In both panels, positive post-February 2022 coefficients indicate relatively larger increases in Ukrainian identification and non-Russian replies in districts with higher pre-war shares of ethnic Russians, consistent with consolidation rather than polarization. Coefficients are normalized relative to the February 2022 survey wave, completed prior to the full-scale invasion. The vertical line marks the invasion onset in late February 2022. The specification includes post-2020 district fixed effects (post-2020 rayons); for internally displaced respondents, the district is defined as the pre–February 2022 district of residence. Standard errors are clustered at the post-2020 district level. Shaded areas indicate 95% confidence intervals.

of Prediction 3: in 2014, the salience and status channels work in opposite directions, producing a net force sufficient to shift self-reported identity but not actual linguistic behavior; in 2022, both channels reinforce each other, generating a shift large enough to extend to revealed-preference measures of language use. We next address potential

concerns related to survey responses and compositional change, and then examine whether similar patterns appear in measures of private linguistic behavior, including Twitter and Google search data.

4.1.4 Potential Concerns

Three concerns are salient for the above survey-based analysis: social desirability in survey responses, compositional change driven by migration and displacement, and language policy confound.

Social desirability bias. If respondents became reluctant to report Russian ethnicity after 2014 or 2022, one would expect an increase in item nonresponse. Figure C.6 shows no meaningful post-2014 or post-2022 change in the share of "no reply" answers to the ethnicity question. This pattern is difficult to reconcile with an interpretation in which the main results are driven by increased refusal or concealment rather than genuine shifts in identity. In addition, Figure C.7 shows only a modest deterioration in attitudes toward Russian-speaking Ukrainians following the 2022 invasion—too small to account for the large changes in language use documented above. We further corroborate the survey evidence using outcomes based on private behavior: post-2022 shifts also appear in Google search behavior and music consumption, which are less exposed to interviewer demand and are observed outside the survey setting.

Migration, refugees, and IDPs. Population movements could mechanically alter the composition of respondents within locations. We address this concern in several ways. First, our specifications control for local displacement intensity. For the 2014 conflict, we use the rayon-level ratio of internally displaced persons (IDPs) to population; for 2022, we control for individual displacement status and assign spatial fixed effects based on respondents' pre-invasion place of residence. Second, Figure C.8 examines heterogeneity by age and sex in 2022 and reveals similar effects across groups, including among military-age men, who were generally not permitted to leave Ukraine after

the invasion. This substantially limits the scope for selective outmigration to explain the observed linguistic shifts. Third, we use Twitter data to estimate models with account fixed effects, so identification comes from within-account changes over time and cannot be driven by changes in the composition of users. The Twitter evidence closely mirrors the survey findings. Finally, surveys of Ukrainian refugees in the European Union indicate that approximately 70% report Ukrainian as their primary language of communication—substantially above the pre-invasion national average.[15]

Language Policy Confound. A potential confound is the 2019 language law, which expanded the use of Ukrainian in public life.[16] Two considerations, however, suggest that it is unlikely to account for the main patterns we document. First, the law was implemented gradually, with provisions phased in over several years, whereas the break in our outcomes is sharp and coincides with the February 2022 invasion. Second, the law primarily regulated institutional and public-facing domains, such as government, media, education, and customer service, rather than individuals' everyday language choices.

4.2 Language of Tweets

We complement the survey-based evidence with high-frequency data from social media. Twitter offers a measure of public language use, enabling us to observe identity-related shifts within the same users. This approach thus complements the KIIS survey results by capturing how the choice between Ukrainian and Russian evolved in public online communication, rather than in a one-off interaction with a survey interviewer and making the analysis robust to population movements.

To estimate within-individual dynamics, we collapse tweets to the account-by-month level and compute, for each account, the share of tweets written in Ukrainian in a given month. We then regress this monthly share on account fixed effects and

[15] International Organization for Migration (2023), *Ukrainian Refugee Response in the European Union: Needs, Intentions, and Integration Challenges*. Migration Research Series No. 74.

[16] Law of Ukraine "On Ensuring the Functioning of the Ukrainian Language as the State Language" (No. 2704-VIII, adopted April 25, 2019), available at https://zakon.rada.gov.ua/laws/show/en/2704-19.

month fixed effects. The inclusion of account fixed effects ensures that variation comes from within-account changes over time, so the estimated month effects trace shifts in the propensity to tweet in Ukrainian relative to January 2022. Importantly, this specification assigns equal weight to each account rather than to individual tweets, preventing highly active users from mechanically driving the results.[17]

Panel A of Figure 3 plots the estimated month fixed effects. The series exhibits a gradual upward trend from 2012 through 2021, with no discrete break around the onset of hostilities in 2014—consistent with the absence of a major level shift in language use in the survey data. In contrast, the post-2022 shift in Ukrainian-language use is large and abrupt, on the order of 20 percentage points, and persists through the end of the sample. The timing and magnitude of this shift closely mirror the survey evidence.

Overall, the Twitter evidence corroborates the survey results and supports the interpretation of a genuine aggregate shift in linguistic practice after the 2022 invasion.[18] The move toward Ukrainian appears not only in survey interviews but also in public online communication, where language choice is observed repeatedly for the same users and is not mediated by an interviewer. This pattern indicates that the changes we document reflect broad and persistent adjustments in everyday language use rather than reporting context or sample composition.

4.3 Language of Google Searches

We next examine private linguistic behavior using Google search data. This analysis complements the survey and Twitter evidence by capturing revealed language choice in a setting that is largely private and therefore less susceptible to social desirability, interviewer demand, or reputational concerns, providing a stringent test of conflict-induced identity change. Specifically, we track pairs of Ukrainian and Russian spellings of the same high-frequency words, allowing us to isolate language choice in

[17] Formally, we estimate $\text{ShareUkr}_{at} = \alpha_a + \gamma_t + u_{at}$, where ShareUkr_{at} is the share of Ukrainian-language tweets posted by account a in month t, and α_a and γ_t denote account and month fixed effects, respectively. Standard errors are clustered at the account level.

[18] We do not pursue regional heterogeneity analysis in the Twitter data because, by 2022, the sample of geolocated tweets had become increasingly selective, likely reflecting changes in privacy settings and willingness to share exact locations, which makes spatial comparisons unreliable.

search behavior rather than changes in what people search for (Appendix B.2.1).

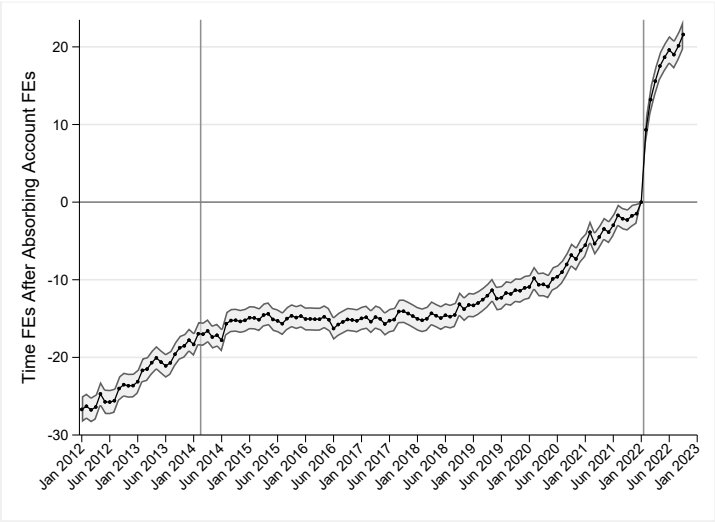
To focus on changes associated with the 2022 invasion, we study Ukrainian versus Russian search activity after removing seasonality and extrapolating pre-invasion trends. Raw dynamics are shown in Figure C.9, which plots quarterly time effects from a regression of the Ukrainian-language search share on time dummies. These raw series exhibit both a pronounced seasonal component and a gradual pre-2022 upward trend, motivating a detrended analysis.

Our detrending procedure consists of three steps. First, we remove seasonality as well as word- and region-specific variation by residualizing the share of searches using Ukrainian spellings with respect to a full set of calendar-quarter by word by region fixed effects. Second, restricting attention to the pre-invasion period, we estimate word- and region-specific linear time trends in the resulting residuals and use the fitted values to construct predicted residual dynamics absent the invasion. Finally, we extrapolate these predicted trends into the post-invasion period and subtract them from the former residuals, yielding a series that captures deviations from both fixed effects and pre-invasion trends.[19] All regressions restrict attention to fully controlled regions, apply the weights described in Appendix B.2.1, and cluster standard errors at the word–region level.

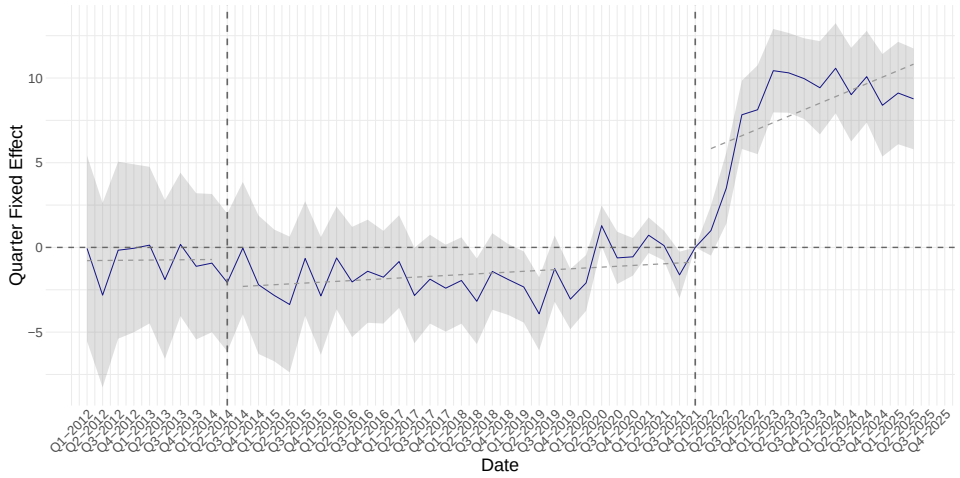
Panel B of Figure 3 presents these detrended time effects. Ukrainian-language searches increase sharply following the invasion: by July 2022, the share of searches in Ukrainian rises by 7.8 percentage points relative to the pre-invasion baseline and subsequently stabilizes between 8 and 10 percentage points over the rest of the sample period. Together with the survey and Twitter evidence, these results indicate a large and persistent shift toward Ukrainian language use that extends to private settings.[20]

[19] Formally, we first estimate $S_{tir} = \gamma_{qir} + \varepsilon_{tir}$, where S_{tir} denotes the share of searches using Ukrainian spelling for word i in region r at time t, occupied and partially occupied regions are excluded, and γ_{qir} are calendar-quarter by word by region fixed effects. We then retain $\hat{\varepsilon}_{tir}$. Then, using pre-2022 data, we estimate $\hat{\varepsilon}_{tir} = \beta_i \times t + \delta_r \times t + u_{tir}$, obtain and extrapolate $\widehat{\varepsilon}^{\text{pre}}_{tir}$, then define and plot $\tilde{\varepsilon}_{tir} = \hat{\varepsilon}_{tir} - \widehat{\varepsilon}^{\text{pre}}_{tir}$.

[20] The shift in Google search behavior is smaller than the corresponding change in survey-based language use. This pattern is consistent with some degree of social desirability bias in self-reported language measures, although we do not emphasize the quantitative difference, since Google users are not necessarily representative of the Ukrainian population.



(a) Twitter (within-account, monthly)



(b) Google searches (detrended, quarterly)

Figure 3: Revealed Language Use: Twitter Posts and Google Searches

Notes: The figure reports within-unit shifts toward Ukrainian language use in two digital settings. Panel A plots month fixed effects from account-level Twitter data geolocated to Ukraine, January 2012–November 2022. For each account-month, we compute the share of tweets labeled as written in Ukrainian among tweets labeled either as written in Ukrainian or Russian, and regress this share on account and month fixed effects. Estimates are normalized to January 2022. Panel B plots quarter fixed effects from Google search data. For each word–region–quarter cell, we compute the share of searches using the Ukrainian spelling rather than the Russian spelling, and residualize this measure with respect to calendar-quarter-by-word-by-region fixed effects and pre-2022 word- and region-specific linear trends. Estimates are normalized to 2021Q4. The Google-search sample is restricted to regions under Ukrainian government control and weighted by word–region search volume. Vertical lines mark February 2014 and February 2022. Shaded areas denote 95% confidence intervals. Standard errors are clustered at the account level in Panel A and at the word–region level in Panel B.

5 Results: Cultural Shifts

We next examine whether the shift toward Ukrainian identity extends into cultural behavior, not just stated identity and language. While culture is a central component of nation-building (Anderson, 1983; Gellner, 1983), cultural behavior has received comparatively less attention in the literature. We complement the survey and social-media evidence with measures of cultural consumption and naming. These outcomes provide a different lens on identity change. Compared with survey responses, which capture stated identity, cultural consumption and naming allow us to study identity through behaviors that may involve switching costs, habit persistence, or long-run commitment.[21] We focus on cultural markers that vary in visibility and commitment. Baby names represent a particularly costly and durable signal of household identity. Cuisine and music, by contrast, capture more routine and largely private day-to-day consumption. Together, these measures allow us to assess whether the post-war shift toward Ukrainian identity extends into everyday life. They also test Prediction 2 of our conceptual framework, which suggests that shifts in identification should manifest not only in stated identity but also in identity-linked behaviors.

5.1 Popular Music and Spotify Charts

We begin with popular music, which offers a useful window into cultural behavior and allows us to trace identity change in a domain of everyday life. Compared with survey-based measures, listening behavior is closer to a private revealed-preference outcome and is therefore less vulnerable to social-desirability bias. Music is also especially informative because it reflects both demand and supply: shifts in listeners' preferences may not only reveal changing identity, but also reshape the cultural environment by altering artists' production decisions.

Spotify entered the Ukrainian market in July 2020 and has since become the leading music streaming platform in the country. By 2023, its market share reached 45% (Statista, 2025). Survey evidence confirms its broad adoption: 45% of Ukrainians

[21] E.g., see Atkin et al. (2021) on using food consumption to study identity choice.

report using Spotify, making it the most widely used paid streaming service (Suspilne Media, 2023). Usage is particularly concentrated among younger cohorts.

Chart-Level Language Dynamics. We begin by documenting changes in the language composition of songs appearing in Spotify's weekly Top-200 charts in Ukraine.

Figure 4 reports the share of chart entries in each language group (Ukrainian, Russian, and Other), while Figure C.11 reports the total weekly number of streams aggregated within each group. Both measures show a *massive sharp decline* in the popularity of Russian-language music after the full-scale invasion. Before February 24, 2022, Russian-language songs accounted for roughly 60–70% of weekly chart entries, while Ukrainian-language songs rarely exceeded 5%. By May 2022, the share of Russian-language tracks had fallen to about 50%, while the share of Ukrainian-language tracks had risen close to 25%. The shift continued thereafter: by early 2023, Ukrainian-language songs had overtaken Russian-language songs in chart presence, streaming volumes, and average chart performance. At the same time, we observe partial substitution toward songs in other languages (primarily English). This pattern is not driven by an increase in songs with missing lyrics,[22] whose chart share and streams remain relatively stable and generally below 10% throughout the period.

Demand-side reallocation holding new releases fixed. To assess whether the post-invasion shift in listening patterns reflects changes in listener demand, rather than merely changes in the composition of new releases, we repeat the analysis restricting the sample to songs released before 2022. Figure C.12 shows that the main patterns remain: Russian-language songs decline sharply, while Ukrainian- and other-language songs gain relative popularity. The similarity between the full-sample and pre-2022 results indicates that the post-invasion shift is not solely a consequence of newly released Ukrainian-language music entering the charts.

[22] Lyrics may be missing because a track is instrumental or they have not yet been uploaded to Genius.

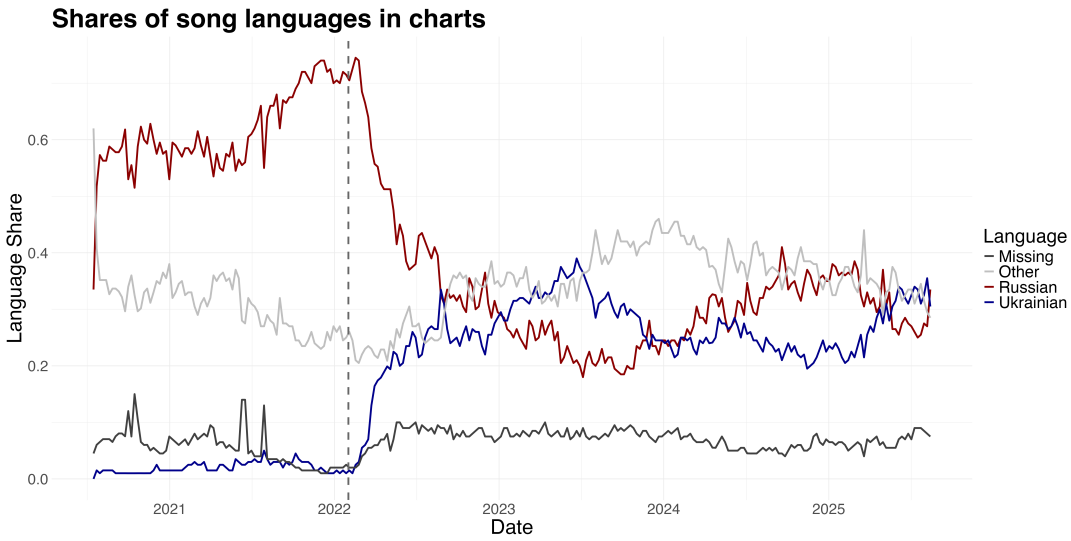


Figure 4: Language Composition of Spotify Top Ukraine Chart Entries, 2020–2025

Notes: The figure reports the weekly share of tracks in the Spotify Weekly Top 200 Songs Ukraine chart by language (Ukrainian, Russian, or other). Track language is determined using lyric-based language detection from Genius. Tracks without available lyrics (e.g., instrumentals or songs not documented on Genius) are classified as "missing" when included.

Mechanism (identity vs artist). A central question is whether the post-invasion shift in music consumption reflects changing language-linked identity preferences or simply reallocation across artists—for example, away from performers who support Russian aggression or toward Ukrainian artists regardless of song language. We address this in two complementary ways. First, using the war-stance classification of Russian artists described in Appendix B.2.4, Figure C.14 shows that songs by artists who support and oppose Russian aggression decline similarly after 2022. This suggests that listeners increasingly move away from Russian-language music not only because of artists' political stance, but also independently of it. Second, to separate language from artist effects, we hold fixed the set of Ukrainian artists and compare chart outcomes by song language within that group. Figures C.15a and C.15b show a rapid reversal: within the same artist pool, the share of Russian-language songs falls from roughly 75% to below 20% within about a month of the invasion, while the share of Ukrainian-language songs rises correspondingly. The same pattern holds when we restrict attention to pre-war releases (Figures C.15c and C.15d), although the

magnitude attenuates over time and Russian-language songs partly recover by 2024. Taken together, these results suggest that the reallocation in music consumption is not driven solely by artist nationality or political stance, but also reflects a broader shift in language-based listening preferences.

Supply response. We next turn to the supply side and study changes in the language of new releases among Ukrainian artists. Figure C.13a shows that, before 2022, the language composition of releases in the Ukrainian-artist catalogue panel was relatively stable, with roughly 60% of new releases in Russian and about 20% in Ukrainian. After the invasion, this distribution shifts sharply: by the end of 2022Q2, Ukrainian-language releases surpass Russian-language releases, and by mid-2023 the pre-war pattern is nearly reversed. Figure C.13c shows an even stronger shift among new artists, defined as those whose first observed release appears after February 24, 2022: 80–90% of their releases are in Ukrainian, while fewer than 5% are in Russian. To test whether this pattern reflects within-artist language switching rather than only entry, exit, or broader compositional change across artists, we estimate regressions of the language share of releases on quarter indicators and artist-level fixed effects.[23] Figure C.13d reports the resulting quarter effects by language. Before February 24, 2022, the estimates are small and statistically indistinguishable from zero. After the invasion, a sharp divergence emerges: within one year, the probability of releasing a song in Ukrainian rises by about 20 percentage points, while the probability of releasing a song in Russian falls by more than 20 percentage points. Together, these results indicate that the supply response reflects substantial within-artist reorientation in language choice.

[23] Specifically, for each language l, we estimate

$$share^{l}_{at} = \theta^{l}_{t} + \alpha_{a} + \varepsilon^{l}_{at},$$

where $share^{l}_{at}$ denotes the share of releases by artist a in quarter t in language l, θ^{l}_{t} are language-specific quarter fixed effects, and α_{a} are artist fixed effects. Standard errors are clustered at the artist level.

5.1.1 *Concerns*

Coverage in occupied and annexed regions. A potential concern is that conflict-related disruptions in Eastern and occupied regions changed the composition of Spotify users in ways that mechanically generated the observed language shift. Several considerations suggest that this is unlikely to account for our results. First, even before the full-scale invasion, Donetsk, Luhansk, and Crimea exhibited the lowest Spotify-related search interest within Ukraine (Table C.4). Second, territories occupied after 2022 accounted for at most a modest share of the pre-invasion population under Ukrainian control,[24] making it difficult for changes in their Spotify access alone to explain the aggregate patterns. Third, the results are not driven solely by a decline in Russian-language streams: Ukrainian-language tracks also rise sharply in absolute streaming volumes and account for a growing share of total streams (Figure C.11). Finally, although migration could matter if emigrants were disproportionately Russian-speaking, available evidence does not suggest a shift large enough to overturn the magnitude and persistence of the observed reallocation.

Recommendations and platform promotion. Another concern is that changes in Spotify's recommendation system may have contributed to the rise of Ukrainian-language music. We cannot rule out some role for platform amplification. Spotify undertook visible editorial and promotional initiatives in support of Ukraine, including fundraising campaigns, curated playlists, and artist features (Spotify Newsroom, 2022, 2023; Suspilne Media, 2024), and these interventions may have increased exposure to Ukrainian music both directly and indirectly through recommendation systems that respond to aggregate listening behavior. However, we do not view this as a plausible mechanical alternative to our interpretation. We are not aware of systematic

[24] Summing oblast-level population estimates for the subsequently occupied territories yields 3.59 million out of 37.44 million residents in areas controlled by Ukraine as of January 1, 2022, or 9.6% (State Statistics Service of Ukraine, 2022). This calculation does not account for the large outflow from war zones, estimated at 2.83 million displaced persons (International Organization for Migration (IOM), 2025), which would further reduce the weight of these areas in national listening aggregates.

evidence that Spotify altered its algorithms specifically to favor Ukrainian-language content, and any platform amplification is better understood as part of the broader post-invasion cultural environment that both reflected and reinforced changes in identity and demand, rather than as an exogenous reweighting that by itself generated the observed patterns. This interpretation is also consistent with the broader evidence in the paper, which points to a shift in language preferences that extends beyond any single platform or recommendation system.

5.2 Baby names

We next examine whether baby naming patterns shift toward more Ukrainian names after the February 2022 full-scale invasion. Naming choices provide a complementary and especially durable measure of identity. Because names are public, persistent, and costly to reverse, changes in naming patterns offer a useful signal of shifts in ethnic and national identification (e.g., Fouka, 2019; Esposito et al., 2023).

Appendix Section B.2.3 describes the data and construction of the name Ukrainianness score, which assigns each name a time-invariant score based on its pre-war relative popularity in Ukraine versus Russia. As an illustration, names such as Bohdan or Solomiya receive relatively high Ukrainianness scores, whereas names such as Yelysei or Yeseniia receive relatively lower scores.

We study how the *popularity* of a name co-moves with its Ukrainianness over time. The estimating equation is:

$$\text{Popular}_{rtn} = \sum_{s \neq 2021\text{ II}} \theta_s(\text{Ukrainianness}_n \times \mathbb{1}[t = s]) + \alpha_{rt} + \eta_{rn} + \varepsilon_{rtn}, \quad (5)$$

where Popular_{rtn} is an indicator equal to one if name n appears in the list of popular names in region r at time t.[25] The coefficients θ_s capture how the association between a name's Ukrainianness and its likelihood of appearing on the list in period s differs from the reference period, the second half of 2021. The specification includes region–

[25] On average, regional lists contain 28 popular names per period. Region–time fixed effects account for variation in the size of these lists across regions and periods.

time fixed effects α_{rt} and region–name fixed effects η_{rn}, so identification comes from changes over time in the relative popularity of more- versus less-Ukrainian names within the same region. Standard errors are two-way clustered by region and name.

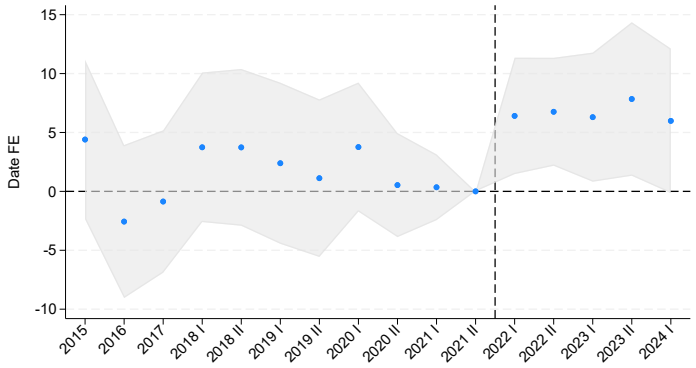
Panel A of Figure 5 plots the event-study coefficients θ_s. The estimates turn positive after 2022, indicating that names with higher Ukrainianness gained relative popularity following the full-scale invasion. We find no evidence of differential pre-trends. Estimating a simple pre-post version of Equation (5) yields the estimates reported in Table 3. The coefficient on Post-February 2022 $\times$ Ukrainianness is about 5.1 percentage points and is statistically significant at conventional levels. This implies that after the full-scale invasion, a fully Ukrainian name became about 5.1 p.p. more likely to appear on a region-period popularity list than a fully Russian name, corresponding to roughly 38% of the sample mean. The estimated effect is positive for both boys' and girls' names, with somewhat larger magnitudes for girls (6.1 p.p.) than for boys (4.0 p.p.). The coefficient for girls is statistically significant at conventional levels, while the estimate for boys is less precisely estimated.

Our main results are robust to alternative specifications that use average name Ukrainianness at the region–period level as the outcome, where we can explicitly control for population displacement and list composition (Appendix B.2.3; Figure B.4). Appendix Figure B.5 further shows that the post-2022 increase is broad-based across the name distribution, with larger gains for more Ukrainian names rather than being driven by a small set of outliers.

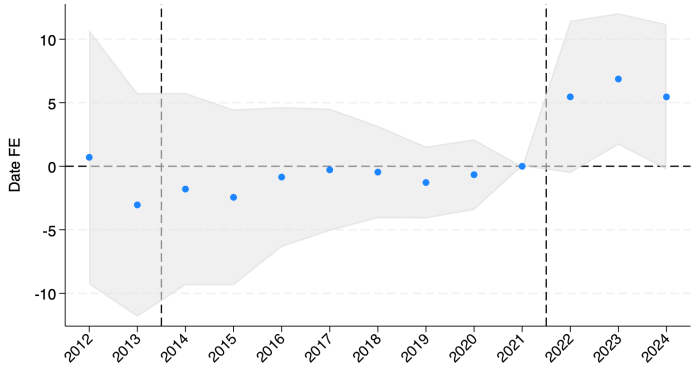
Taken together, these results indicate a broad-based shift in naming choices toward more Ukrainian names following the full-scale invasion, consistent with a strengthening of national identity that extends to durable and intergenerational decisions.

5.3 Cuisine

Finally, we examine cuisine as an additional dimension of cultural identity change. Cuisine reflects everyday consumption choices based on revealed preferences rather than stated attitudes. We proxy interest in national Ukrainian cuisine using Google



(a) Baby names (half-yearly)



(b) Cuisine (yearly Google Trends)

Figure 5: Cultural Reallocation toward Ukrainian Content: Baby Names and Cuisine

Notes: Each panel reports event-study coefficients that trace how the association between a cultural marker's pre-war Ukrainianness and its popularity evolves over time. In both panels, coefficients are on interactions between period indicators and a time-invariant Ukrainianness score constructed from pre-war relative popularity in Ukraine versus Russia; positive post-2022 coefficients indicate that more-Ukrainian items become relatively more popular after the full-scale invasion. Panel A estimates Equation (5) at the name $\times$ region $\times$ period (half-year or year) level; the outcome is an indicator equal to one if name n appears in the Ministry of Justice list of most popular names in region r and period t; the specification includes region–period and region–name fixed effects; coefficients are normalized to the second half of 2021 (the last pre-invasion period); the sample excludes regions occupied in 2022; standard errors are clustered at the region level. Panel B estimates Equation (6) at the dish $\times$ oblast $\times$ month level, aggregated to the yearly frequency; the outcome is the raw Google Trends score for dish i in oblast r and month t; the specification includes dish-by-oblast and oblast-by-month fixed effects; coefficients are normalized to 2021, the omitted reference year; vertical lines mark the onset of hostilities in 2014 and the full-scale invasion in 2022; standard errors are two-way clustered by dish and oblast. Shaded areas denote 95% confidence intervals in both panels.

search activity for food and recipes, which captures private, routine consumption-related behavior at high frequency. While we are not aware of a comparable survey benchmark for Ukraine, survey evidence from other settings suggests that online

Table 3: Baby-Name Popularity and Ukrainianness

	Popular name indicator			
	(1)	(2)	(3)	(4)
Sample	All	All	Boys	Girls
Post-February 2022 × Ukrainianness	5.016**	5.148**	4.050	6.130***
	(1.849)	(1.874)	(2.654)	(2.124)
Dependent variable mean	13.593	13.593	14.774	12.528
Dependent variable st. dev.	34.271	34.271	35.485	33.104
Observations	83,134	83,134	39,400	43,734
Region × Time FE		✓	✓	✓
Region × Name FE		✓	✓	✓

Notes: This table reports regression estimates of the post–February 2022 change in the association between a baby name's popularity and its pre-war *Ukrainianness*. The unit of observation is name $i\times$ region $r\times$ half-year t. The dependent variable, $Popular_{irt}$, is an indicator equal to one if name i appears in the Ministry of Justice list of most popular baby names in region r and period (half-year/year) t; it is multiplied by 100, so coefficients are in percentage points. The key regressor is the interaction $Post_t \times I_i^U$, where $I_i^U \equiv \frac{U_i}{U_i+R_i}$ is a name-level score computed from pre-war name frequencies: U_i is the pre-war share of name i among births in Ukraine and R_i is the analogous share in Russia, taken from forebears.io. Columns report the coefficient on $Post_t \times I_i^U$ for the full sample (columns 1–2), boys (column 3), and girls (column 4). Column (1) includes no fixed effects. Columns (2)–(4) add region×period fixed effects and region×name fixed effects. Standard errors in parentheses are two-way clustered by region and by name. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

recipe search is a mainstream activity: in a 2024 survey of U.S. consumers, 91% of respondents reported using online recipes (Chicory, 2024).

For each dish in our sample, we assign a time-invariant Ukrainianness score based on its relative pre-invasion popularity in Google Trends searches in Ukraine versus Russia. We then study how dish popularity evolves across regions over time as a function of this score. Appendix B.2.2 provides details on the data, score construction, and validation.

We estimate the following event-study specification, which allows the relationship between dish Ukrainianness and search popularity to vary by year:

$$\text{Popularity}_{irt} = \sum_{s \neq 2021} \theta_s \left(\text{Ukrainianness}_i \times \mathbb{1}[t = s]\right) + \alpha_{ir} + \delta_{rt} + \varepsilon_{irt}, \tag{6}$$

where Popularity_{irt} denotes Google Trends search intensity for dish i in oblast r and month t. In the baseline specification, we use the nonmodified Google Trends score $\text{Popularity}_{irt}^{raw}$, normalized to its within-oblast maximum over 2012–2024. In an alternative specification, we use a standardized version, $\text{Popularity}_{irt}^{std}$, which is additionally demeaned and scaled to unit variance at the dish level to aid interpretation. The fixed effects α_{ir} absorb time-invariant differences in dish popularity across oblasts, while δ_{rt} capture common shocks to search activity by oblast-month. The coefficients θ_s measure how the association between dish Ukrainianness and its popularity differs from its baseline 2021 level. Standard errors are two-way clustered by dish and oblast.

Panel B of Figure 5 reports the yearly event-study estimates using the nonmodified score. Estimates are stable prior to 2022 and rise thereafter, indicating higher relative search intensity for more Ukrainian dishes within the same oblast-month. The post-2022 increase is amounting to roughly five points on the relative 0–100 Google Trends scale. Figure C.10 shows the same pattern using the standardized outcome, confirming that the result is not driven by dish-specific scaling. In standardized units, the post-2022 effect corresponds to approximately 0.2–0.3 standard deviations.

Finally, we assess whether the results are driven by a small number of high-share dishes. The cross-dish relationship between Ukrainianness and the war-period change in popularity is smooth, with no evidence that a handful of outliers account for the pattern (Figure B.2; see Appendix B.2.2 for details).

Importantly, the estimated effect operates through searches for dishes rather than for branded products. The dish set consists of basic, non-branded food items, so the results are unlikely to be driven by the disappearance of Russian brands or by reduced availability of imported products from Russia.

Taken together, these results indicate that war-induced identity change is reflected not only in language use and self-identification, but also in everyday consumption choices. The reallocation toward more Ukrainian dishes suggests that identity shifts extend beyond public or institutional contexts to private, everyday consumption.

Across all three cultural domains, the evidence points in the same direction: the strengthening of Ukrainian identification after 2022 was accompanied by large shifts in revealed-preference behavior. Baby names, cuisine, and music differ substantially in visibility, adjustment costs, and time horizon, yet each exhibits a clear reallocation toward Ukrainian cultural markers. The music evidence also suggests a reinforcing dynamic: as listeners shifted toward Ukrainian-language music, artists reoriented their output in the same direction. The share of Ukrainian-language releases rose sharply, and new entrants released overwhelmingly in Ukrainian, expanding the repertoire available to consumers and potentially lowering the cost of conforming to the national prototype over time. Taken together, these patterns are consistent with Prediction 2 of the conceptual framework and with the broader idea that identity change can reshape the cultural environment in ways that reinforce itself.

6 Conclusion

This paper studies how large-scale external conflict reshapes national identity in a historically heterogeneous society. Using Ukraine as a setting, we examine how two major conflict shocks—the onset of hostilities in 2014 and Russia's full-scale invasion in 2022—affected ethnic identification, language use, and cultural behavior. We combine nationally representative surveys with digital traces of public and private behavior, allowing us to track identity change across multiple domains and levels of publicness.

We find consistent evidence of national consolidation rather than polarization. Both conflict episodes generate sharp and persistent shifts toward Ukrainian ethnic and linguistic identity, with the largest changes occurring precisely in regions that were historically more ethnolinguistically Russian. These patterns are difficult to reconcile with narratives emphasizing ethnic fragmentation or backlash. Instead, they suggest that external threat can strengthen national identification even in societies with substantial pre-existing cultural and linguistic ties to the aggressor.

The effects we document extend well beyond stated identity. Following the 2022 invasion, language use shifts sharply toward Ukrainian not only in survey interviews,

but also in public communication on social media and in private Google searches. Cultural behavior responds in parallel: Ukrainians increasingly favor Ukrainian-language music, Ukrainian cuisine, and traditionally Ukrainian baby names. These outcomes span margins with very different visibility, adjustment costs, and time horizons, yet all move in the same direction. Taken together, this pattern strengthens the interpretation that the observed changes reflect genuine identity transformation rather than short-lived symbolic responses.

These patterns are consistent with an endogenous identity framework in which conflict reshapes identification through three forces: group status, the salience of group boundaries, and perceived distance from competing national prototypes. In 2022, all three operate in the direction of consolidation. Ukraine's resistance and the breadth of international support raise the status of the Ukrainian nation; the full-scale invasion sharply heightens the salience of the interstate boundary; and behavioral adjustments such as switching language reduce individuals' perceived distance from the Ukrainian prototype. The more muted response after 2014—when self-reported ethnicity shifts but language use does not—is also consistent with the framework. In that episode, the salience channel still favored consolidation, but the status channel likely worked in the opposite direction, limiting adjustment to lower-cost margins. More broadly, the framework does not imply that external war always consolidates national identity. Consolidation arises under conditions like those in Ukraine in 2022—indiscriminate attack, a failed blitzkrieg, and sustained national resistance—whereas the same framework can generate polarization when the aggressor quickly succeeds, raises its own status, and activates internal divisions.

Methodologically, the paper contributes to the literature on conflict and nation-building by directly distinguishing consolidation from polarization within the same empirical setting and by showing how survey data, digital traces, and administrative records can be combined to study identity in ways that are less vulnerable to concerns about social desirability or limited behavioral relevance.

Overall, the Ukrainian case highlights the malleability of national identity in re-

sponse to external violence. Identity is often treated as slow-moving and deeply rooted, yet our evidence shows that large-scale conflict can generate rapid, durable, and behaviorally meaningful change—even where fragmentation once appeared plausible. These findings matter for theories of nation-building, for our understanding of collective resilience under threat, and for broader debates about the long-run political and economic consequences of war.

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Online Appendix

War and Nation-Building: Evidence from Ukraine

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A Literature Review

A.1 Research in Sociology, Political Science, and Psychology

The relationship between nation-building and military conflict has received sustained attention across the social sciences. Seminal work in sociology and political science emphasizes the role of war in state formation and the construction of national identity. In modernist and statist accounts, large-scale military conflict raises states' demands for taxation, conscription, and coordination, prompting elites to invest in public goods and promote a shared national identity to sustain mass mobilization (Tilly, 1975; Mann, 1993). Related work highlights how modernization and industrialization generate pressures for cultural standardization, leading to the construction of common languages and "high cultures" that facilitate national integration (Gellner, 1983; Anderson, 1983). In these perspectives, nationalism is largely a product of modernity, shaped by elite responses to the demands of war and governance (Smith, 1998; Hutchinson, 2017).

In contrast, ethnosymbolist approaches emphasize continuity rather than invention. Smith (1986) argues that modern nations draw on pre-modern myths, symbols, and collective memories, and that shared rituals of commemoration provide the foundations for durable national identities. Under this view, the shared trauma and affective potency associated with wars often consolidate national identities through bottom-up processes rooted in collective experience rather than elite instrumentalization (Smith, 1981; Hutchinson, 2017).

At the same time, a substantial body of comparative and case-based research documents that conflict can weaken national identification when violence overlaps with internal ethnic, linguistic, or regional cleavages. Wimmer (2012) traces the global emergence of nation-states, providing empirical support for statist theories, while Darden and Mylonas (2016) highlight the role of external military threats in expanding national schooling. Yet other work shows that conflict can reinforce subnational identities. For example, Hughes (2011) demonstrates how British state violence during

the Troubles entrenched Irish nationalism and radicalized communities. Similarly, Sambanis and Shayo (2013) find that civil conflict can weaken national attachment in favor of increased ethnic identification. Relatedly, Sambanis et al. (2015) argue that victory in interstate conflict strengthens national identity, while defeat erodes it.

Micro-level research further clarifies the mechanisms underlying these divergent outcomes. Brewer (1999) distinguishes between ingroup attachment and outgroup hostility, showing that national identification need not entail animus toward minorities, although Rui J. P. de Figueiredo and Elkins (2003) find that patriotic pride often correlates with prejudice. Fritsche et al. (2017) show that traumatic events increase reliance on ingroups by heightening feelings of personal helplessness. Experimental evidence further suggests that external threats can raise national identification primarily by increasing hostility toward outgroups rather than by deepening attachment to the nation itself (Sambanis and Lee, 2023).

Taken together, this literature establishes that the relationship between violent conflict and national identity is theoretically ambiguous and empirically context-dependent. While some forms of war foster national consolidation, others intensify internal divisions. Crucially, existing studies rarely distinguish consolidation from polarization within the same country or trace identity change across both attitudes and behavior, motivating the empirical approach adopted in this paper.

A.2 Economic Research

(a) General Approaches. Alesina et al. (2020) formalize the nation-building role of wars emphasized by Tilly (1975) and Mann (1993); they argue that governments at war expand public goods and invest in nation-building to rally citizens, making identity formation a strategic policy choice. Relatedly, Aghion et al. (2019) document that investments in mass primary education rise with external military rivalry, and that this response is stronger in democracies. Complementing this external-threat channel, Alesina et al. (2021) study when rulers deliberately homogenize the population and argue that the strongest incentives arise when elites are threatened by

democratization; they emphasize mass primary education as a central instrument of nation-building. Relatedly, Almagro and Andrés-Cerezo (2020) show theoretically that nation-building's success at supplanting regional identities is contingent on economic, social, and political factors.

In contrast, Shayo (2009) models identity formation as an endogenous choice between class and nation. Individuals balance similarity to other group members with the relative status of each group, yielding equilibria in which the poor may either identify with their class and support high redistribution or with the nation and accept lower redistribution. National eminence, external threats, or heterogeneity within the lower class can shift identification toward the nation, dampening redistributive demands. This framework is especially relevant for studying Ukraine, where conflict and external threat heighten the salience of national identity and reshape the trade-offs between alternative self-conceptions.

(b) Comparative and Individual Case Studies. Previous empirical studies in economics have examined the role of language and the tension between national and narrower (ethnic or regional) identities. With regards to the former, Fouka (2020) demonstrates that post-WWI language bans targeting ethnic Germans in the United States produced backlash rather than assimilation, while Clots-Figueras and Masella (2013) find that bilingual education in Catalonia reinforced a regional identity, even among ethnic Spaniards. A complementary approach emphasizes intergroup contact rather than direct language policy: exploiting quasi-random exposure to Indonesia's Transmigration program, Bazzi et al. (2019) show that policy-induced local diversity can foster long-run integration, including greater use of the national language and other markers of assimilation. With regards to the latter, Depetris-Chauvin et al. (2020) demonstrate that football victories in Sub-Saharan Africa raise national identification and reduce interethnic violence, whereas Dehdari and Gehring (2022) show that the repressive nation-building efforts in Alsace-Lorraine (by the German Empire after 1871 and by the French Republic after 1918) reinforced and entrenched regional identities.

Beyond nation-building policy, Jha (2013) shows that interethnic economic complementarities can sustain long-run coexistence: South Asian medieval trading ports, where Hindu-Muslim exchange was institutionalized, were substantially less prone to Hindu-Muslim riots long after the original trade advantages dissipated.

DellaVigna et al. (2014) specifically focus on the (legacy of) military conflict, finding that access to cross-border Serbian radio in Croatia increased support for extreme nationalist parties and ethnically offensive expression. This result indicates that conflict can reinforce national identification while also bolstering outgroup sentiment. Relatedly, Cannella et al. (2024) examines the German temporary annexation of parts of Northern Italy and finds persistent increases in political polarization and electoral support for both left- and right-wing extremist parties.

A distinct line of work studies large-scale state-building interventions in diverse societies. Carlitz et al. (2025) analyze Tanzania's Ujamaa villagization and political education campaign and find persistent increases in national identity and perceived state legitimacy among exposed cohorts, alongside trade-offs: exposure lowers demands for democratic accountability and does not increase generalized interethnic trust. In a related spirit, Bazzi et al. (2025) study Indonesia's mass public school construction program and show that state expansion induced competitive entry by Islamic schools rather than crowd-out, with long-run consequences for political and cultural outcomes, including higher religiosity.

Finally, Ananyev and Poyker (2023) highlight why the relationship between conflict and national identity is theoretically ambiguous. Studying the Tuareg rebellion in Mali, they show that proximity to conflict reduced identification with the nation and strengthened ethnic identities among groups not directly engaged in the fighting. Their findings suggest that conflict can undermine rather than consolidate the nation, particularly when it exposes the weakness of state institutions. This insight underscores a key point for our study: the direction of identity change in response to violent conflict cannot be determined *ex ante*, making Ukraine a crucial case for understanding the conditions under which war either consolidates or fragments national identity.

(c) Agent-Level. Microeconomic theory models identity as both a preference and a constraint. Individuals derive utility from conforming to group norms and from the esteem associated with belonging, while deviation produces disutility (Akerlof and Kranton, 2000; Kranton, 2016). Because identities are partly chosen and partly imposed, people invest in self-conceptions that reinforce their place within valued groups, particularly when those identities are contested or threatened (Bénabou and Tirole, 2011). Utility itself depends on the standing of the group, so that people often optimize as members of a collective rather than as isolated individuals (Akerlof, 2016). This rationale clarifies why external threats are powerful triggers of nation-building. When conflict raises the stakes of group membership, individuals are more likely to adopt the behaviors that signal alignment with the nation.

Empirical work provides additional insights. Bauer et al. (2016) synthesize evidence from surveys and behavioral experiments across a wide range of settings and conclude that exposure to wartime violence tends to increase local cooperation and civic engagement, with suggestive evidence that these effects are often parochial rather than universal. Weisel and Zultan (2016) show experimentally that when individuals perceive their group as the target of threat, they reallocate effort and loyalty toward the ingroup. Yet Gehring (2021) demonstrates that Russian aggression in 2014 increased European identification in areas closer to Russia, illustrating how external threats can reorient supranational instead of purely national attachments.

A.3 Measuring National Identity

Recent work studying individuals' national identities has introduced a host of measurement approaches complementing traditional surveys. Social media offers a source of high-frequency data, with shifts in language use and online self-presentation serving as barometers of national identity (Abramenko et al., 2024). Metzger et al. (2016) follow a similar approach by analyzing Twitter language choice during the Euromaidan protests, treating users' preferred and actual posting languages as proxies for ethnolinguistic identification. Naming choices serve as a complementary, durable

measure. Since names are public and costly to reverse, changes in their ethnic distinctiveness capture individuals' national identities (Fouka, 2019; Esposito et al., 2023; Assouad, 2025). Consumption behavior serves as a third outcome: Atkin et al. (2021) infer ethnic and religious identity from food consumption patterns in India, while Nardotto and Sequeira (2025) exploit the Brexit referendum to show that shifts in the salience of national identity affect consumers' relative demand for domestic versus foreign goods. Recent work has shown that conflict-related shocks during the Iraq War exerted changes on food brand consumption in the US (Pandya and Venkatesan, 2016; Helms et al., 2025). Our paper relies on, and develops, all three of these measurement approaches.

B Additional Details on Data Construction

B.1 KIIS Survey Data and Variable Definitions

Our baseline analysis uses repeated cross-sections from the Kyiv International Institute of Sociology (KIIS) omnibus surveys, fielded quarterly between 2008 and 2024. The data comprise 72 survey waves and more than 156,000 respondents and are designed to be nationally representative of the adult population. We restrict the sample to respondents residing in territories under Ukrainian government control at the time of each survey wave.

B.1.1 Survey-Based Identity Outcomes.

We study three survey-based identity outcomes that are consistently available over time: two measures of self-reported ethnicity ("nationality") and the language used during the interview.

Nationality (open-ended). KIIS first asks respondents an open-ended question on self-identified nationality:

> ***Question:*** *"What is your nationality, as you consider yourself?"*

Responses are subsequently coded by KIIS into predefined categories, including Ukrainian, Russian, both Ukrainian and Russian (only when explicitly stated by the respondent), Belarusian, Jewish, other, and no reply.

Nationality gradient. For respondents identifying as Ukrainian and/or Russian, KIIS additionally administers a more granular ordered question (available through early 2022) intended to capture mixed and intermediate identities:

> ***Question:*** *"I will ask you to answer one more question about nationality, in order to record it as accurately as possible. This is because some people consider themselves to belong to two nationalities at the same time. Please look at this card*

and tell me which of these statements best corresponds to your opinion of yourself. I consider myself…"

The response categories are: (i) Only Ukrainian; (ii) Both Ukrainian and Russian, but more Ukrainian; (iii) Equally Ukrainian and Russian; (iv) Both Russian and Ukrainian, but more Russian; (v) Only Russian.

Interview language. Finally, KIIS records the language used during the interview following a standardized protocol:

> ***Instructions:*** *Interviewers greet respondents neutrally, ask which language is easier for them, and conduct the interview in the chosen language.*

Interview language is coded as Ukrainian, Russian, or mixed Ukrainian–Russian. Because this measure reflects a revealed linguistic choice in a low-stakes interaction rather than a direct attitudinal response, it provides a useful complement to self-reported identity measures.

In addition to identity outcomes, we also use a measure of attitudes toward ethnic minorities based on a standard "social distance" battery (e.g., willingness to accept members of a minority group as family members, close friends, neighbors, coworkers, residents or guests of Ukraine, or not admit them to Ukraine). This outcome is coded as an ordered index and, in robustness checks, as a set of category indicators.

B.2 Google Trends Data

B.2.1 Language Use in Google Searches

Word List Construction. To construct comparable Ukrainian–Russian search measures, we begin by downloading text corpora from the Leipzig Corpora Collection (Goldhahn et al., 2012; Leipzig Corpora Collection, 2025). For Ukrainian, we use the 2019 corpus consisting of one million sentences drawn from Ukrainian websites; for Russian, we use the 2015 corpus of one million sentences collected from websites in Ukraine. From each corpus, we extract nouns only.

Each Ukrainian noun is translated into Russian, and each Russian noun is translated into Ukrainian, producing two translation lists. We then match translations across lists to form pairs of words with identical meanings but different spellings. Words that are spelled identically in both languages are excluded. We retain the 198 most frequently used unique word pairs for analysis. [26]

Google Trends Queries and Aggregation. For each word pair i, region r, and month t, we retrieve Google Trends indices for both the Ukrainian and Russian spellings over the period 2012–June 2025. Although Google Trends data are inherently relative and scaled within each query, retrieving both spellings simultaneously ensures that the two series are directly comparable. We use these to construct the Ukrainian-language search share for each word–region–time combination. Because this measure is defined as a ratio within each pair, it is comparable across regions and over time. We aggregate monthly data to the quarterly level to reduce noise. Let $popularity^{uk}_{tir}$ and $popularity^{ru}_{tir}$ denote the corresponding search indices.

Outcome Construction. We define the relative share of Ukrainian spelling as:

$$S_{tir} = 100 \times \frac{popularity^{uk}_{tir}}{popularity^{uk}_{tir} + popularity^{ru}_{tir} + \epsilon}, \quad \epsilon = 10^{-3}$$

We additionally construct weights reflecting the relative importance of each word pair in total search activity within a region:

$$w_{i,r} = \frac{\sum_t \left(popularity^{uk}_{tir} + popularity^{ru}_{tir}\right)}{\sum_{ti} \left(popularity^{uk}_{tir} + popularity^{ru}_{tir}\right)}.$$

Our baseline specifications weight observations by w_{ir}, though results are robust to unweighted alternatives.

[26] Examples of word pairs among the ten most common include "year" (Ukrainian: *rik*; Russian: *god*), "person" (Ukrainian: *liudyna*; Russian: *chelovek*), and "child" (Ukrainian: *dytyna*; Russian: *rebenok*).

B.2.2 Interest in National Cuisine

Dish Selection. We measure cultural consumption using Google search interest in national cuisine. The dish set comprises 100 items compiled from Wikipedia lists of Ukrainian and Russian cuisine.

Query Construction. For each dish, we retrieve Google Trends indices by oblast from 2012 to 2024 at monthly frequency. To avoid mechanically loading cuisine on language choice, each query combines Ukrainian- and Russian-language spellings using an OR operator, yielding a single popularity series per dish.

Ukrainianness Score. Since Google Trends normalizes search intensity within each query, indices are not directly comparable across independent searches. Because only a limited number of terms can be queried jointly, we use Borsch as a fixed reference term and scale all other dishes relative to it. This procedure allows us to construct consistent relative popularity distributions across countries and over time. Each dish i is assigned a time-invariant Ukrainianness score:

$$U_i \equiv \frac{\bar{s}_i^{UKR}}{\bar{s}_i^{UKR} + \bar{s}_i^{RUS}},$$

where $\bar{s}_i^c$ denotes the dish's average pre-war share of search intensity within country c, computed by normalizing dish indices to sum to one within each country-month and averaging over 2012–2021. Higher values of U_i indicate dishes searched disproportionately more in Ukraine than in Russia prior to the war.

Validation. We assess the external validity of the cuisine Ukrainianness score using within-Ukraine cross-sectional variation. Appendix Figure B.1 plots, for each oblast, the average Ukrainianness of dishes implied by pre-war search behavior against the oblast's share of ethnic Russians in the 2001 Census. The relationship is strongly negative: oblasts with a larger pre-war ethnic Russian presence display systematically

lower baseline Ukrainianness in cuisine-related searches. This pattern is consistent with the intended interpretation of the score and mirrors the validation exercise for baby names. Occupied regions (Crimea, Donetsk, Luhansk, and Sevastopol) are excluded.

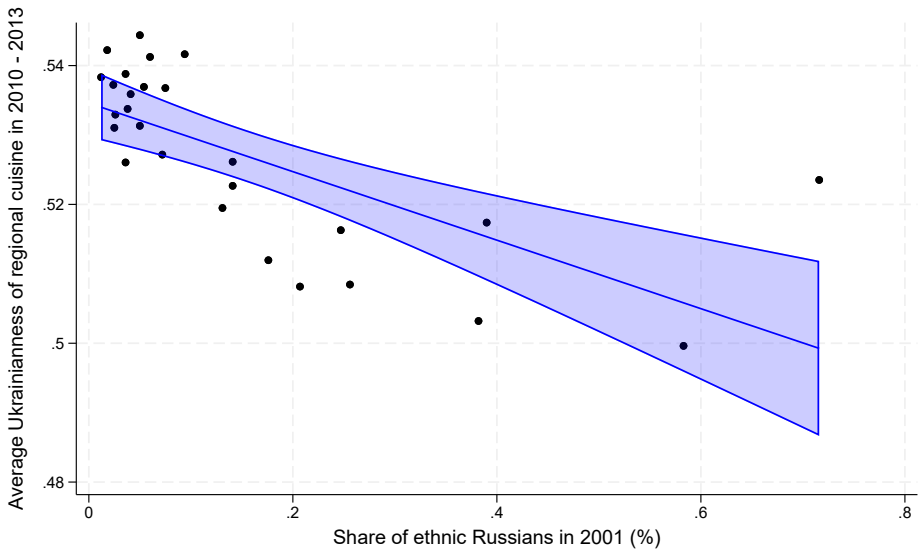


Figure B.1: Validating the Cuisine Ukrainianness Score within Ukraine

Notes: This figure assesses the external validity of the cuisine *Ukrainianness* score within Ukraine. Each point is a region (oblast) and plots the oblast's average pre-war cuisine Ukrainianness—computed as the search-share-weighted mean of dish-level Ukrainianness using Google Trends data from 2010–2013—against the oblast's share of ethnic Russians in 2001 (Census). The solid line is the linear fit; the shaded area is the 95% confidence band. Consistent with the interpretation of the score, regions with a higher pre-war share of ethnic Russians tend to display lower Ukrainianness of cuisine-related searches.

Outcomes. Let $\text{Popularity}_{irt}^{raw}$ denote the Google Trends score for dish i in oblast r and month t. We also report a standardized outcome:

$$\text{Popularity}_{irt}^{std} = \frac{\text{Popularity}_{irt}^{raw} - \overline{\text{Popularity}_{i,r,2012\text{–}2021}^{raw}}}{sd(\text{Popularity}_{i,r,2012\text{–}2021}^{raw})},$$

computed dish-by-dish using the pre-war distribution.

Dish-level gradient. Finally, the dish-level classification plot in Figure B.2 summarizes the cross-dish relationship between war-period changes in search intensity and

U_i. In a first step, we estimate dish-specific post-2022 changes in search intensity in a dish-region-month panel,

$$\text{Popularity}_{irt} = \alpha_{ir} + \gamma_{rt} + \delta_i \text{Post}_t + \varepsilon_{irt},$$

where α_{ir} are dish-region fixed effects and γ_{rt} are region-time fixed effects. The coefficients δ_i capture dish-specific deviations in the post period relative to the pre-period, net of region-specific time shocks. In a second step, we relate these estimated dish-level shifts to the Ukrainianness score,

$$\delta_i = \beta U_i + \eta_i,$$

so that β captures whether more-Ukrainian dishes experienced systematically larger increases in search intensity after 2022.

Within the dish set, the Ukrainianness score aligns with common culinary associations: canonical Ukrainian dishes such as borscht and holubtsi receive high values, while dishes more closely associated with Russian cuisine receive low values. Figure B.2 shows a clear positive gradient in the post-2022 period: estimated changes in search intensity δ_i are increasing in U_i. This pattern implies a systematic reallocation of attention toward more Ukrainian dishes, rather than changes concentrated in a small number of queries.

B.2.3 Baby names: data construction and validation

Ministry of Justice lists. We collect lists of the most popular baby names by region and half-year from the Ukrainian Ministry of Justice for 2015–2024. The number of names listed varies across region–period cells. The resulting panel has three dimensions (name n, region r, period t).

Name Ukrainianness. Following the approach of constructing ethnic-name indices from relative name frequencies across groups (Fryer and Levitt, 2004), each name is

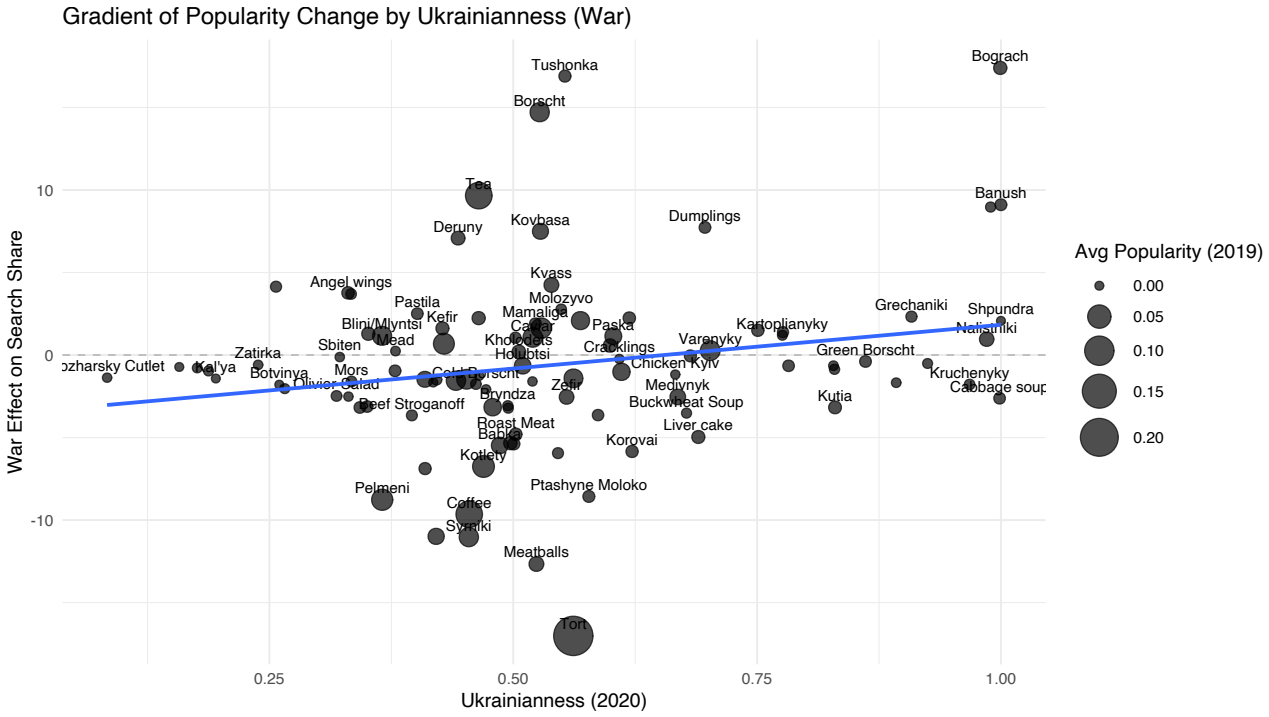


Figure B.2: 2022 War Change in Dish Search Share versus Dish Ukrainianness.

Notes: Each point represents a dish. The horizontal axis reports the dish's Ukrainianness score, constructed from pre-war relative search shares in Ukraine and Russia. The vertical axis plots the dish-level change in search intensity during the war period, measured as the change in the dish's share of total searches within the 100-dish set between the pre-war baseline (2012–2021) and the war period (2022–2024), using the same Google Trends measure as in the main analysis. Marker style indicates dish classifications (e.g., prepared dishes vs. broad categories vs. spike-driven items). The fitted lines summarize the cross-dish relationship between war-period changes in search intensity and Ukrainianness score within each classification; a positive slope indicates larger increases for more-Ukrainian dishes.

assigned a time-invariant Ukrainianness score based on its pre-war relative popularity in Ukraine versus Russia using *Forebears.io*:

$$\text{Ukrainianness}_n = \frac{U_n}{U_n + R_n},$$

where U_n and R_n are the pre-war shares of name n in Ukraine and Russia, respectively. We treat alternative spellings/transliterations of the same name as equivalent (e.g., "Serhii" and "Sergey").

The dataset contains 211 unique names (100 boys, 111 girls). The Ukrainianness score is approximately uniformly distributed on $[0, 1]$; its first quartile, median, and

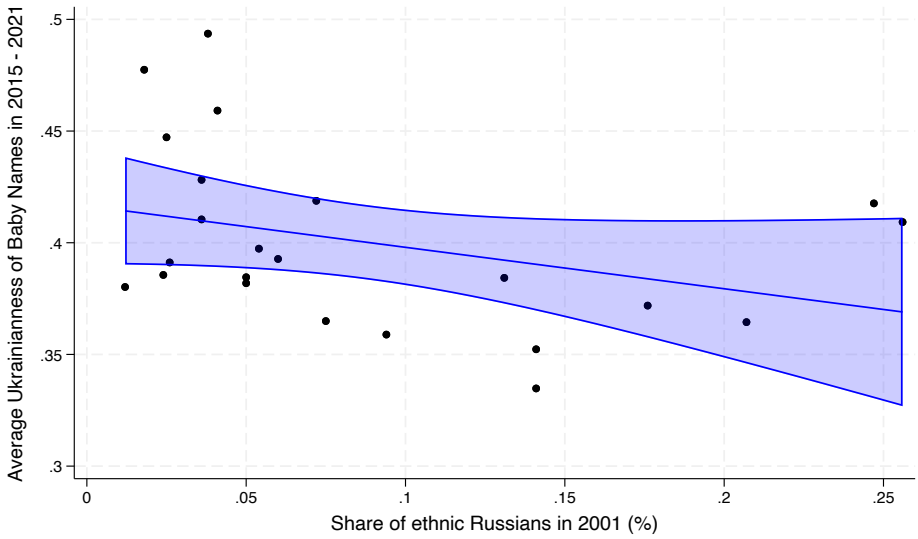


Figure B.3: Validating the Baby-Name Ukrainianness Score within Ukraine

Notes: This figure assesses the external validity of the baby-name *Ukrainianness* score within Ukraine. Each point corresponds to an oblast and plots the average Ukrainianness of names appearing in the Ministry of Justice popularity lists during 2015–2021 against the oblast's share of ethnic Russians in the 2001 Census. Regions that were at least partially occupied (Crimea, Donetsk, Luhansk, and Sevastopol) are excluded. The solid line shows the linear fit, and the shaded area indicates the 95% confidence band. Consistent with the interpretation of the score, oblasts with higher pre-war shares of ethnic Russians tend to have lower average Ukrainianness of popular baby names.

third quartile are 0.21, 0.50, and 0.84.

Validation. Appendix Figure B.3 plots each region's average Ukrainianness (computed over 2015–2021) against the region's share of ethnic Russians in the 2001 Census. The fitted relationship is negative: regions with a larger pre-war Russian ethnic presence exhibit lower baseline Ukrainianness of popular baby names, consistent with the intended interpretation of the measure. Crimea, Donetsk, Luhansk, and Sevastopol are excluded from this validation exercise.

Alternative specification. As a more transparent alternative to the main specification, we estimate half-year effects for the average Ukrainianness of popular names at the

region×period level (restricting to regions not occupied in 2022):

$$\text{Ukrainianness}_{rt} = \sum_{s \neq 2021\ \text{II}} \beta_s \mathbb{I}[\text{period} = s] + X_{rt}'\Gamma + \alpha_r + \varepsilon_{rt}, \tag{7}$$

where the second half of 2021 is the omitted period and α_r are region fixed effects. Controls $X_{r,t}$ include the number of distinct names listed in region r and period t (allowing for a region-specific slope δ_r), as well as region-by-period measures of internal displacement inflows and a proxy for refugee outflows. Standard errors are clustered by region. This specification allows us to explicitly control for population displacement.

Figure B.4 exhibits a classic event-study pattern: coefficients are near or below zero and stay roughly flat around zero, followed by a sharp and sustained increase beginning in 2022 I. This indicates that, controlling for region fixed effects, cell size, and refugee/IDP exposure, the average Ukrainianness of popular names rose markedly after the full-scale invasion of February 24, 2022.

Name-level gradient. To assess whether the effect is broad-based across names, we estimate name-specific post-war changes in popularity after absorbing region–time and region–name fixed effects:

$$\text{Popular}_{rtn} = \tau_n \mathbb{I}[t \geq \text{Feb 2022}] + \alpha_{rt} + \eta_{rn} + u_{rtn}, \tag{8}$$

and relate the estimated $\hat{\tau}_n$ to Ukrainianness_n (unweighted and weighted by pre-2022 popularity):

$$\hat{\tau}_n = \alpha + \beta\, \text{Ukrainianness}_n + \varepsilon_n. \tag{9}$$

Figure B.5 shows a positive and statistically significant gradient, indicating that the post-2022 reallocation toward Ukrainian names is not driven by a handful of outliers.

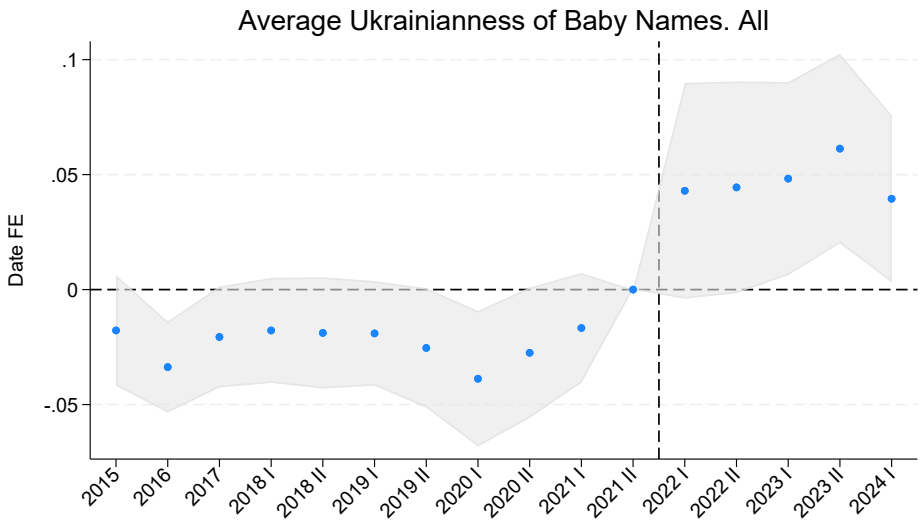


Figure B.4: Average Ukrainianness of popular baby names over time (non-occupied regions)

Notes: The figure plots half-year coefficients from equation (7), which estimates changes in the average Ukrainianness of popular baby names across regions over time. The outcome, $\text{Ukrainianness}_{r,t}$, is the mean Ukrainianness score of names appearing in the Ministry of Justice popular-name list in region r and period t. The specification includes region fixed effects, region-specific slopes in the number of listed names ($N_{r,t}$), and controls for refugee inflows and the share of internally displaced persons. Coefficients are normalized to zero in 2021 II (the omitted reference period) and therefore represent deviations relative to the pre-invasion period. The sample is restricted to regions not occupied in 2022. Standard errors are clustered at the region level; whiskers denote 95% confidence intervals.

B.2.4 Music Consumption: Spotify Charts and Artist-Level Data

Scope and Main Sources. We measure music consumption using Spotify Weekly Top Songs charts for Ukraine (Spotify, 2025a). Historical weekly chart data are scraped from Kworb (2025). The sample covers July 17, 2020 (Spotify's official entry into the Ukrainian market) through August 14, 2025. To enrich chart entries with song metadata and release dates, we use the Genius API (Genius, 2025) and the Spotify Web API (Spotify, 2025c). For the supply-side analysis, we additionally construct a list of Ukrainian artists using NUAM Club (2025), Spotify (2025b), and Wikipedia contributors (2025).

Chart Panel Construction. The raw weekly chart data contain song titles, artist names, chart dates, chart positions, and weekly stream counts for songs ranked in

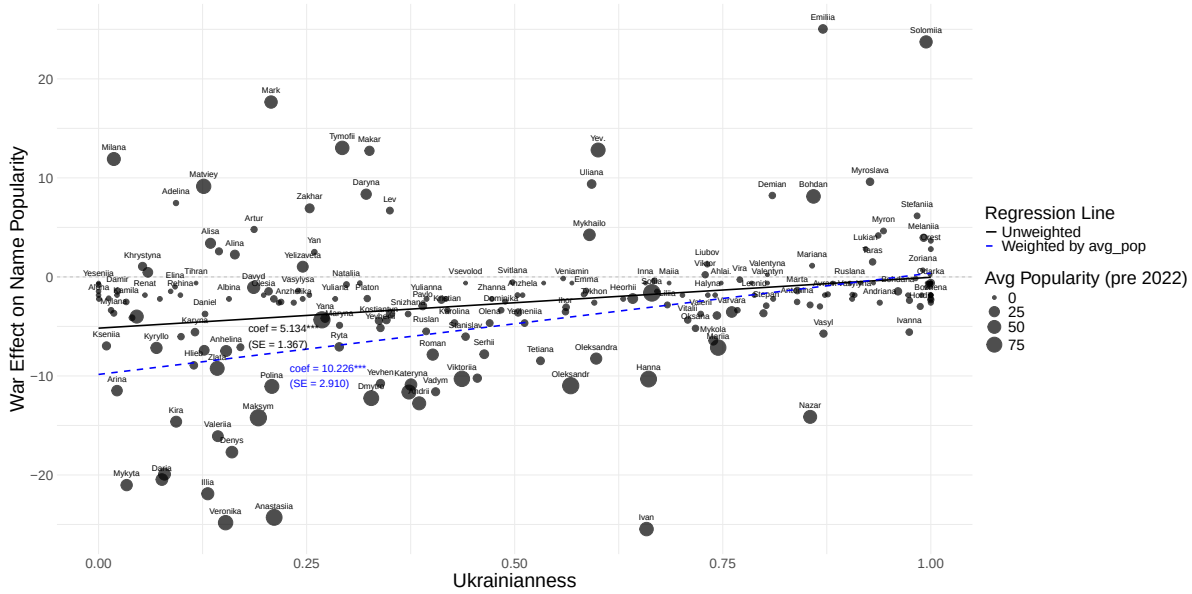


Figure B.5: Name-Level War Effects and the Ukrainianness Correlation

Notes: Each point represents a name. The vertical axis plots the estimated name-specific post-February 2022 effect $\hat{\tau}_n$ from equation (8), which is obtained from a difference-in-differences specification with region–time and region–name fixed effects. The horizontal axis reports the name's pre-war Ukrainianness score. Solid lines show the cross-sectional gradient from equation (9), estimated (i) unweighted and (ii) weighted by the name's average pre-2022 popularity. Marker size is proportional to pre-2022 average popularity. A positive slope indicates that more-Ukrainian names experienced larger post-2022 increases in popularity.

Spotify's Top-200 chart in Ukraine. We reshape these weekly snapshots into a song-week panel. The final chart dataset contains 3,850 distinct tracks performed by 572 artists. The baseline unit of observation is a song-week chart entry.

Song Matching and Metadata Enrichment. We harmonize song titles and artist names across sources and construct song-level identifiers used to merge metadata. We then retrieve release dates and additional song metadata from Genius and the Spotify Web API. These release dates are used to define pre-war and post-war release subsamples (e.g., restricting to songs released before 2022 to isolate demand-side shifts in listening behavior).

Lyrics Collection and Language Classification. We classify charting songs by language using lyrics retrieved via the Genius API (Genius, 2025). After matching each

charting track to a Genius entry, we apply automated language detection to the retrieved lyrics. For the main analysis, songs are assigned to mutually exclusive language groups: *Ukrainian*, *Russian*, *Other*, and *Missing lyrics*. The *Other* category includes primarily English-language songs and other non-Ukrainian/non-Russian tracks. Songs with unavailable lyrics are retained in the dataset and tracked separately.

Popularity Measures. Using the song-week panel, we construct week-by-language measures of chart presence and popularity. The main outcomes are: (i) the share of Top-200 entries belonging to each language group, and (ii) the total number of weekly streams aggregated within each language group. These measures are computed analogously for subsamples (e.g., pre-2022 releases only; Ukrainian artists only).

Pre-War Release Restriction (Demand-Side Sample). To reduce the influence of post-invasion changes in the composition of newly released songs, we construct a restricted chart sample that excludes songs released in 2022 or later. This pre-2022 release sample is used to isolate demand-side changes in listening behavior while holding the set of potentially consumed songs closer to the pre-war supply.

Artist Classification by Attitude Toward the War. For the analysis by artists' political stance, we classify artists based on Stars About War Project (2025). We match artists appearing in the Ukrainian Spotify charts to this source and assign available classifications (e.g., pro-war, anti-war) at the artist level. The resulting artist-level classification is merged onto the song-week panel through chart artist identifiers. Artists not matched to the source remain unclassified in this exercise.

Ukrainian Artist List (Supply-Side Sample). To study supply-side language choice, we construct a list of artists of Ukrainian origin whose songs appear in the Spotify Ukraine charts. We begin from the union of artist names collected from NUAM Club (2025), Spotify (2025b), and Wikipedia contributors (2025), then harmonize names and

restrict to artists with at least one chart appearance in our sample. This procedure yields a final list of 266 Ukrainian artists.

Artist Catalogue Data and Release-Level Panel. For each artist in the Ukrainian-artist list, we retrieve the available catalogue from Genius (via Genius, 2025), including song titles, lyrics (when available), and release dates. We apply the same lyrics-based language classification procedure used for charting songs. This produces a release-level dataset with artist identifiers, release dates, and language labels, which is used to study changes in the language composition of newly released music.

Artist-Quarter Panel for Within-Artist Language Choice. We aggregate the release-level dataset to an artist-by-quarter panel. For each artist a, quarter t, and language l, we construct the release share

$$share_{at}^{l} \equiv \frac{\#\text{ releases by artist } a \text{ in quarter } t \text{ in language } l}{\#\text{ total releases by artist } a \text{ in quarter } t}.$$

This panel is used in specifications with quarter fixed effects and artist fixed effects to isolate within-artist changes in language choice over time.

B.3 Administrative Reform and Geographic Units

Ukraine's 2020 administrative reform consolidated the pre-existing rayon system into a smaller number of larger districts (rayons), eliminating the earlier category of cities of regional significance as separate administrative units. Prior to the reform, Ukraine was divided into 490 rayons and 187 cities of regional significance; after 2020, these units were reorganized into 136 post-reform rayons.

In analyses of the 2014 conflict, we use fixed effects and clustering at the pre-2020 district level (old rayons and cities of regional significance), which corresponds to the administrative units governing respondents' local environment at that time. In analyses of the 2022 invasion, we instead use fixed effects and clustering at the post-2020 district level, consistent with the contemporaneous administrative structure.

A key constraint is that district-level ethnic composition—specifically, the share of ethnic Russians—is observed only in the 2001 Census and is defined for pre-2020 districts. We therefore use this measure throughout the paper. For post-2020 observations, we map respondents' settlements to their corresponding pre-2020 districts, allowing us to merge the census-based ethnic composition measure and include it (and its interactions with post-2022 indicators) alongside post-2020 district fixed effects.

B.4 Construction of Internally Displaced Persons Measures

To account for population displacement and assess robustness to migration-related compositional change, we construct measures of internally displaced persons (IDPs) at the local level using administrative data from the Ukrainian Ministry of Social Policy.

For the period 2014–2019, we use oblast-level counts of registered IDPs provided by the Ministry of Social Policy (upon request of the United Nations). In April 2020, the Ministry publicly reported IDP counts at the district (rayon) level. To obtain a consistent local measure over time, we map post-2020 districts to their corresponding pre-reform units and adjust earlier oblast-level series to the post-2020 district structure using population shares.

A known feature of the IDP registry is that it includes some individuals—particularly pensioners and disabled persons—who formally registered in government-controlled areas to access social payments while continuing to reside in non-government-controlled territories. To mitigate the influence of such registrations on measured displacement intensity, we adjust IDP counts by netting out the estimated share of pensioners and disabled individuals among registered IDPs. Specifically, we compute this share using administrative statistics from seven western regions of Ukraine, where incentives for cross-line registration were minimal due to distance from occupied territories, and apply the resulting adjustment factors to other regions. This procedure follows the logic that registration-based overcounting was most pronounced in areas geographically proximate to the conflict zone.

The resulting IDP measures capture variation in local displacement intensity while

reducing sensitivity to administrative registration behavior. In the empirical analysis, these measures are used as controls and in robustness checks.

C Additional Results

Table C.1: The Effect of the 2014 War on Ethnic Identity: Five-Category Gradient

	(1) Only Ukrainian	(2) More Ukrainian	(3) Mixed Ukr./Rus.	(4) More Russian	(5) Only Russian
Panel A: Post-war shift					
Post-February 2014	3.753**	-0.133	-1.798**	-0.256	-1.566***
	(1.527)	(0.693)	(0.903)	(0.457)	(0.468)
Dependent variable mean	79.782	6.491	6.862	2.898	3.967
Dependent variable st. dev.	40.163	24.637	25.282	16.775	19.518
Observations	87,272	87,272	87,272	87,272	87,272
Controls	✓	✓	✓	✓	✓
Rayon FE	✓	✓	✓	✓	✓
Panel B: Heterogeneity by pre-war share of ethnic Russians					
Post-February 2014 × share of ethnic Russians	55.669***	1.000	-27.472***	-8.576**	-20.622***
	(11.594)	(4.479)	(9.378)	(3.514)	(3.718)
Dependent variable mean	79.782	6.491	6.862	2.898	3.967
Dependent variable st. dev.	40.163	24.637	25.282	16.775	19.518
Observations	87,272	87,272	87,272	87,272	87,272
Controls	✓	✓	✓	✓	✓
Rayon FE	✓	✓	✓	✓	✓
Wave FE	✓	✓	✓	✓	✓

Notes: This table reports regression estimates of respondents' reported ethnic identity on a post–February 2014 indicator and its interaction with pre-war local ethnic composition, testing the polarization hypothesis. The dependent variable is a five-category identity gradient ranging from exclusively Ukrainian to exclusively Russian (with intermediate categories capturing more Ukrainian, mixed Ukrainian–Russian, and more Russian). Panel A reports coefficients on *Post–February 2014*, an indicator equal to one for interviews conducted after February 2014. Panel B reports coefficients on *Post–February 2014 × Share of ethnic Russians*, where the share is measured at the district level (pre-2020 rayons and cities of regional significance) using the 2001 Census. All specifications include district fixed effects; Panel B specifications additionally include survey-wave fixed effects. All columns include controls for sex, age, education, an urban/rural indicator, district-level inflows of internally displaced persons per capita, regional GDP per capita, and CPI. Standard errors (in parentheses) are clustered at the district level.

Table C.2: The Effect of the 2014 War on Language Use: Three-Category Gradient

	(1) Replying in Ukrainian	(2) Replying in Mixed (Ukr.–Rus.)	(3) Replying in Russian
Panel A: Post-war shift			
Post-February 2014	1.835	-1.079	-0.756
	(2.332)	(1.115)	(2.042)
Dependent variable mean	47.479	13.282	39.239
Dependent variable st. dev.	49.937	33.938	48.829
Observations	95,117	95,117	95,117
Controls	✓	✓	✓
Rayon FE	✓	✓	✓
Panel B: Heterogeneity by pre-war share of ethnic Russians			
Post-February 2014 × share of ethnic Russians	-10.628**	24.542***	-13.914**
	(4.653)	(6.212)	(5.808)
Dependent variable mean	47.479	13.282	39.239
Dependent variable st. dev.	49.937	33.938	48.829
Observations	95,117	95,117	95,117
Controls	✓	✓	✓
Rayon FE	✓	✓	✓
Wave FE	✓	✓	✓

Notes: This table reports regression estimates of respondents' interview-language choice on a post–February 2014 indicator and its interaction with pre-war local ethnic composition, testing the polarization hypothesis. The dependent variables are indicators for replying in Ukrainian, replying in mixed Ukrainian–Russian, and replying in Russian (columns 1–3). Panel A reports coefficients on *Post–February 2014*, an indicator equal to one for interviews conducted after February 2014. Panel B reports coefficients on *Post–February 2014 × Share of ethnic Russians*, where the share is measured at the district level (pre-2020 rayons and cities of regional significance) using the 2001 Census. All specifications include district fixed effects; Panel B specifications additionally include survey-wave fixed effects. All columns include controls for sex, age, education, an urban/rural indicator, district-level inflows of internally displaced persons per capita, regional GDP per capita, and CPI. Standard errors (in parentheses) are clustered at the district level.

Table C.3: The Effect of the 2022 Invasion on Language Use: Three-Category Gradient

	(1) Replying in Ukrainian	(2) Replying in Mixed (Ukr.–Rus.)	(3) Replying in Russian
Panel A: Post-war shift			
Post-February 2022	19.667***	0.041	-19.708***
	(1.440)	(0.640)	(1.837)
Dependent variable mean	59.068	10.584	30.348
Dependent variable st. dev.	49.171	30.763	45.977
Observations	48,744	48,744	48,744
Controls	✓	✓	✓
Rayon FE	✓	✓	✓
Panel B: Heterogeneity by pre-war share of ethnic Russians			
Post-February 2022 × share of ethnic Russians	53.366***	35.040***	-88.406***
	(9.172)	(2.445)	(9.321)
Dependent variable mean	59.068	10.584	30.348
Dependent variable st. dev.	49.171	30.763	45.977
Observations	48,744	48,744	48,744
Controls	✓	✓	✓
Rayon FE	✓	✓	✓
Wave FE	✓	✓	✓

Notes: This table reports regression estimates of respondents' interview-language choice on a post–February 2022 indicator and its interaction with pre-war local ethnic composition, testing the polarization hypothesis. The dependent variables are indicators for replying in Ukrainian, replying in mixed Ukrainian–Russian, and replying in Russian (columns 1–3). Panel A reports coefficients on *Post–February 2022*, an indicator equal to one for interviews conducted after February 2022. Panel B reports coefficients on *Post–February 2022 × Share of ethnic Russians*, where the share is measured at the pre-2020 district level (pre-2020 rayons and cities of regional significance) using the 2001 Census. All specifications include post-2020 district fixed effects (post-2020 rayons). For internally displaced respondents, the district is defined as the pre–February 2022 district of residence; Panel B specifications additionally include survey-wave fixed effects. Specifications control for sex, age, education, an urban/rural indicator, pre-2020 district share of ethnic Russians, and an indicator for being internally displaced interacted with the survey-wave identifier. Standard errors (in parentheses) are clustered at the post-2020 district level.

Table C.4: Spotify Popularity by Region (19/07/2020 - 19/02/2022)

Region	SpotifyPopularity
Kyiv city	100
Kharkiv Oblast	97
Lviv Oblast	90
Odessa Oblast	73
Dnipropetrovsk Oblast	66
Cherkas'ka oblast	66
Khmel'nyts'ka oblast	65
Zaporiz'ka oblast	65
Chernivets'ka oblast	64
Ivano-Frankivs'ka oblast	64
Rivnens'ka oblast	63
Khersons'ka oblast	62
Zakarpats'ka oblast	62
Mykolaivs'ka oblast	62
Vinnyts'ka oblast	60
Poltavs'ka oblast	60
Kirovohrads'ka oblast	59
Chernihivs'ka oblast	58
Ternopil's'ka oblast	58
Kyivs'ka oblast	58
Volyns'ka oblast	58
Sevastopol' city	57
Zhytomyrs'ka oblast	55
Sums'ka oblast	54
Luhans'ka oblast	52
Donetsk Oblast	52
Crimea	51

Notes: The table reports regional Google Trends search interest in Spotify for the period July 19, 2020 to February 19, 2022. Values are normalized on a 0–100 scale within Ukraine, where 100 corresponds to the region with the highest relative search intensity over the selected period.

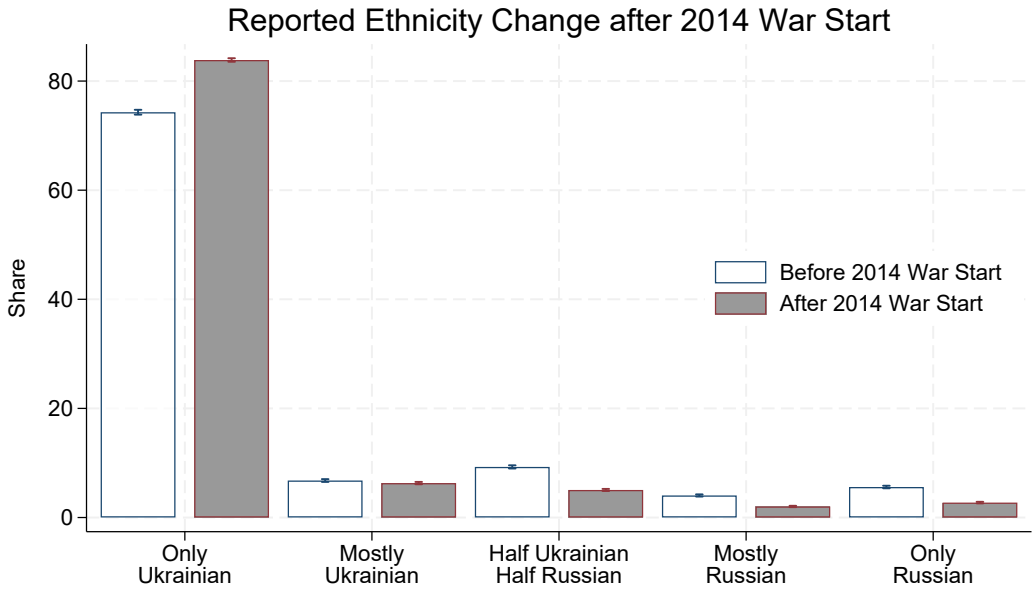


Figure C.1: Reported Ethnic Identity Before and After the 2014 Conflict Onset

Notes: This figure plots mean shares of respondents across five self-reported ethnicity categories in the KIIS survey, comparing the pre-conflict period (2008–2013) to the post-conflict period (2014–2020). The five categories are: only Ukrainian, mostly Ukrainian, mixed Ukrainian–Russian, mostly Russian, and only Russian. Bars show period means computed after excluding observations from Crimea and districts that were occupied after 2014 (fully or partially). Error bars show 95% confidence intervals.

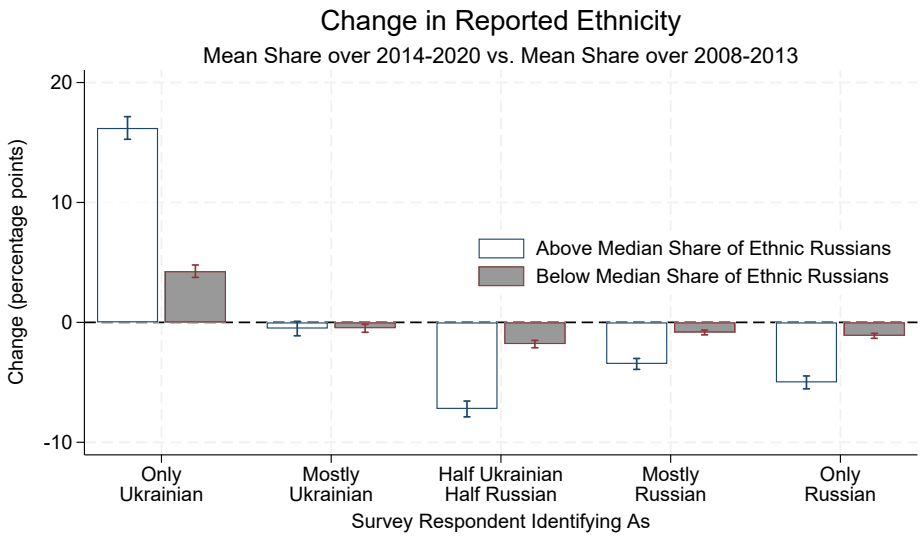


Figure C.2: Change in Ethnic Identity Post 2014 War, by Pre-War Ethnic Composition

Notes: This figure plots changes in the mean share of respondents in each self-reported ethnicity category in the KIIS survey between the post-war period (March 2014–2020) and the pre-war period (2008–February 2014). Categories are: only Ukrainian, mostly Ukrainian, half Ukrainian–half Russian, mostly Russian, and only Russian. The sample excludes observations from Crimea and from districts that were fully or partially occupied after 2014. Bars report $\Delta\bar{x} = \bar{x}_{2014\text{–}2020} - \bar{x}_{2008\text{–}2013}$. White bars correspond to respondents in districts with an above-median pre-war share of ethnic Russians measured using the 2001 Census; gray bars correspond to respondents in districts with a below-median share. Error bars show 95% confidence intervals for the difference in period means.

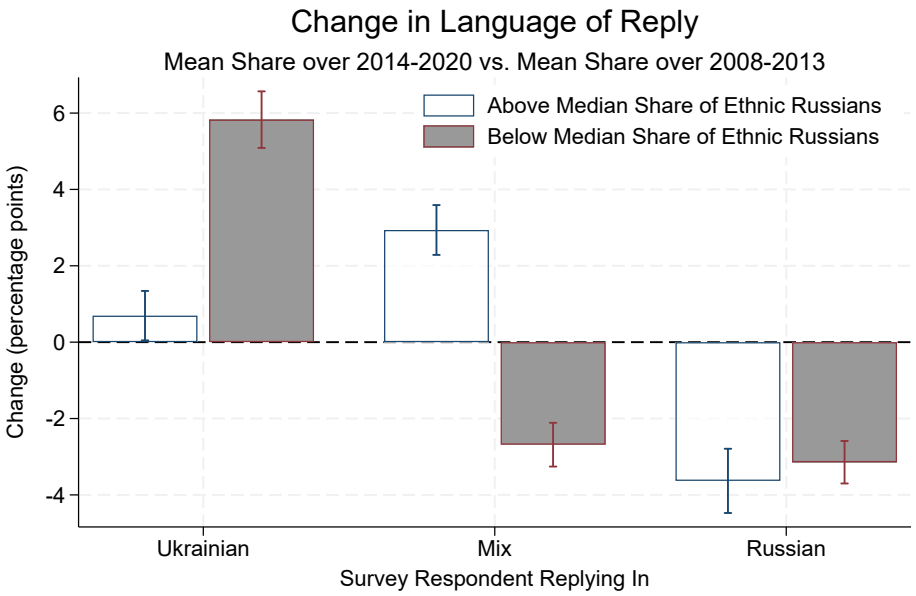


Figure C.3: Change in Reply Language Post 2014 War, by Pre-War Ethnic Composition

Notes: This figure plots changes in the mean share of KIIS respondents replying in Ukrainian, mixed Ukrainian–Russian, and Russian between the post-war period (March 2014–2020) and the pre-war period (2008–February 2014). The sample excludes observations from Crimea and districts that were fully or partially occupied after 2014. Bars report $\Delta\bar{x} = \bar{x}_{2014–2020} - \bar{x}_{2008–2013}$, expressed in percentage points. White bars correspond to respondents in districts with an above-median pre-war share of ethnic Russians measured using the 2001 Census; gray bars correspond to respondents in districts with a below-median share. Error bars show 95% confidence intervals for the difference in period means.

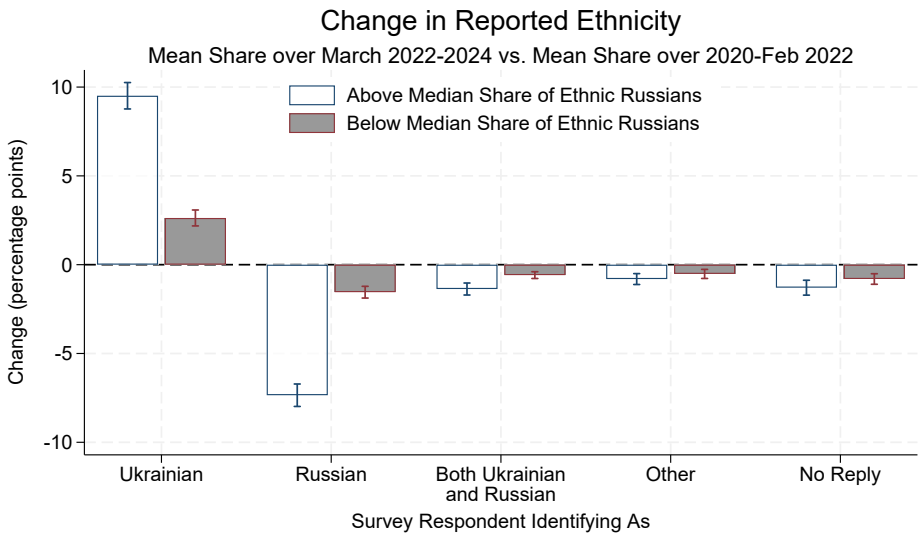


Figure C.4: Change in Ethnic Identity Post 2022 Invasion, by Pre-War Ethnic Shares

Notes: This figure plots the change in the mean share of respondents in each self-reported ethnicity category in the KIIS survey between the post-invasion period (March 2022–2024) and the pre-invasion period (2020–February 2022). Categories are: Ukrainian, Russian, both Ukrainian and Russian, other ethnicity, and no reply. Bars report $\Delta\bar{x} = \bar{x}_{\text{Mar 2022–2024}} - \bar{x}_{\text{2020–Feb 2022}}$. White bars correspond to respondents in districts with an above-median pre-war share of ethnic Russians measured using the 2001 Census; gray bars correspond to respondents in districts with a below-median share. Error bars show 95% confidence intervals computed from the difference in period means.

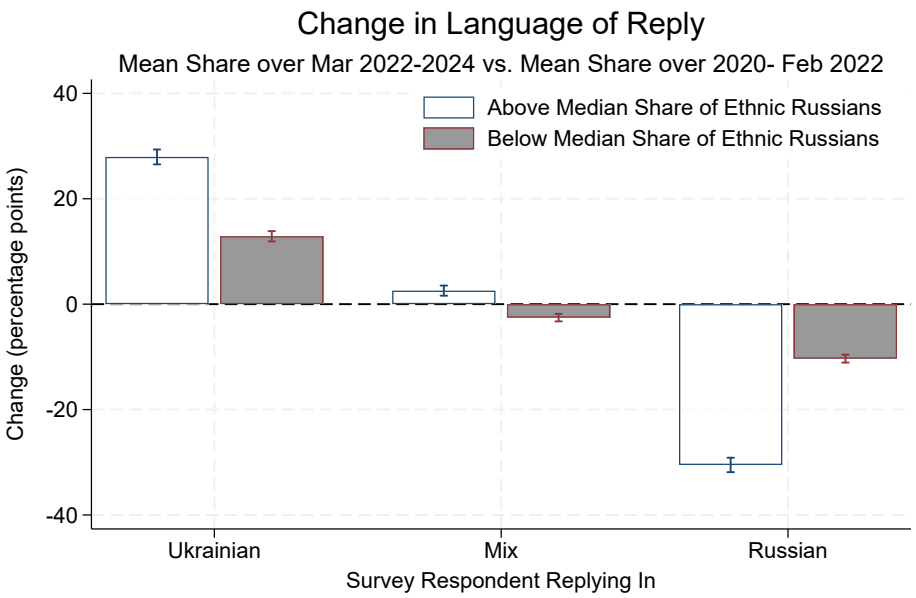
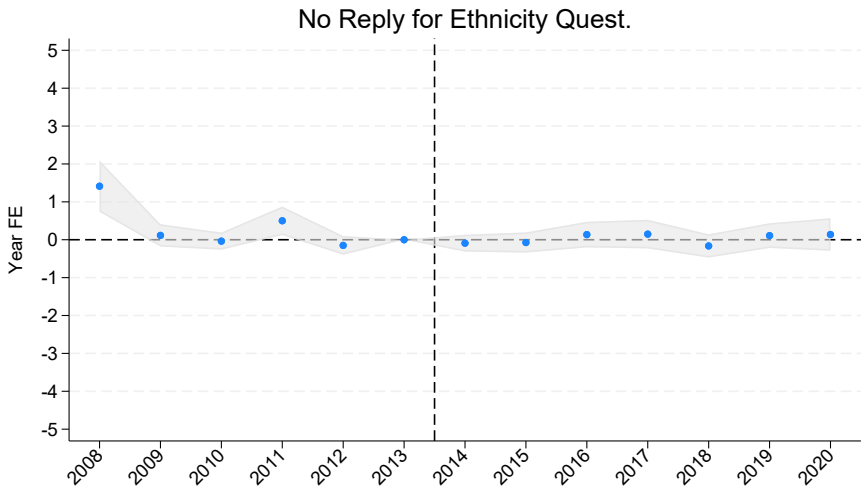


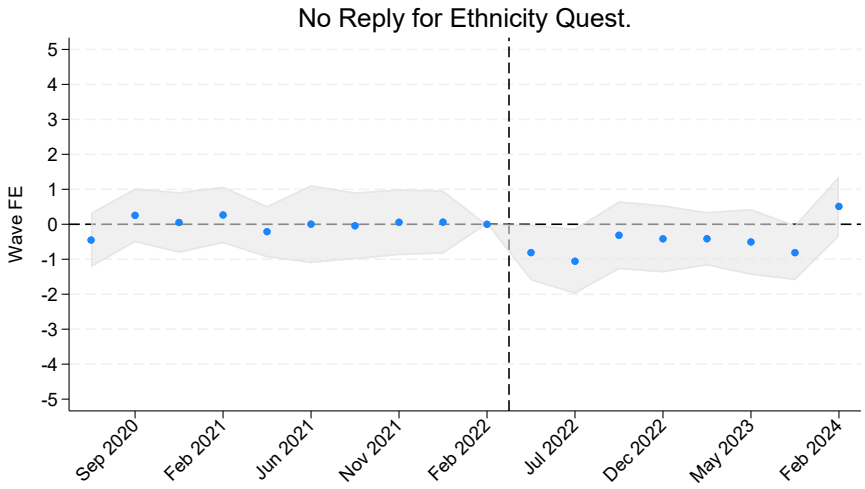
Figure C.5: Change in Reply Language Post 2022 Invasion, by Pre-War Ethnic Shares

Notes: This figure plots the change in the mean share of KIIS respondents replying in Ukrainian, mixed Ukrainian–Russian, and Russian between the post-invasion period (March 2022–2024) and the pre-invasion period (2020–February 2022). Bars report $\Delta\bar{x} = \bar{x}_{\text{Mar 2022–2024}} - \bar{x}_{\text{2020–Feb 2022}}$, expressed in percentage points. White bars correspond to respondents in districts with an above-median pre-war share of ethnic Russians measured using the 2001 Census; gray bars correspond to respondents in districts with a below-median share. Error bars show 95% confidence intervals computed from the difference in period means.

Figure C.6: No-reply ethnicity question: time fixed effects



(a) Year fixed effects around the 2014 conflict



(b) Survey-wave fixed effects around the 2022 invasion

Notes: This figure plots the estimated time fixed effects from regressions of an indicator for not answering the ethnicity question in surveys. Panel A reports yearly fixed effects (normalized to 2013) for the 2014 conflict period, controlling for pre-2020 district (rayon/city of regional significance) fixed effects and individual covariates (sex, age, education, and an urban/rural indicator). Panel B reports survey-wave fixed effects (monthly; normalized to February 2022) for the 2022 full-scale invasion period, controlling for post-2020 district (rayon) fixed effects and individual covariates (age, sex, education, cohort-by-five-year fixed effects, urban/rural, family finances). Standard errors are clustered at the district level (pre-2020 districts in Panel A; post-2020 districts in Panel B). The figure is used to assess social-desirability bias by showing whether item nonresponse on ethnicity shifts discontinuously around the two conflict episodes.

Figure C.7: Attitudes Toward Russian-Speaking Ukrainians, 2020–2023

Notes: The figure reports the distribution of responses to the question of whether respondents would accept Russian-speaking Ukrainians in various social roles over 4 waves between 2020 and 2023. Social roles include: as family members, close friends, neighbors, work colleagues, residents of Ukraine, or guests of Ukraine, as well as the share stating they would not let them into Ukraine. Each bar sums to 100 percent within survey wave.

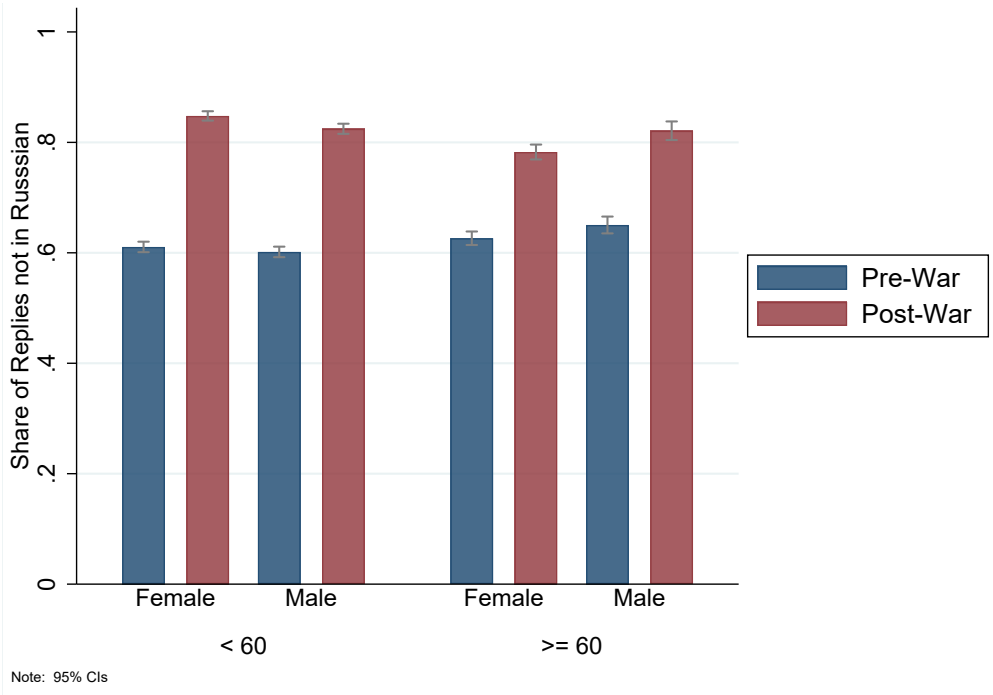


Figure C.8: Change in Ukrainian Language Use in Survey Interviews by Sex and Age

Notes: The figure shows the share of survey respondents replying not in Russian (equal to one for replying in Ukrainian or mixed Ukrainian–Russian) before and after the February 2022 full-scale invasion. Estimates are reported separately by sex and age group (below 60 and 60 or older). Bars display group means and vertical lines indicate 95% confidence intervals.

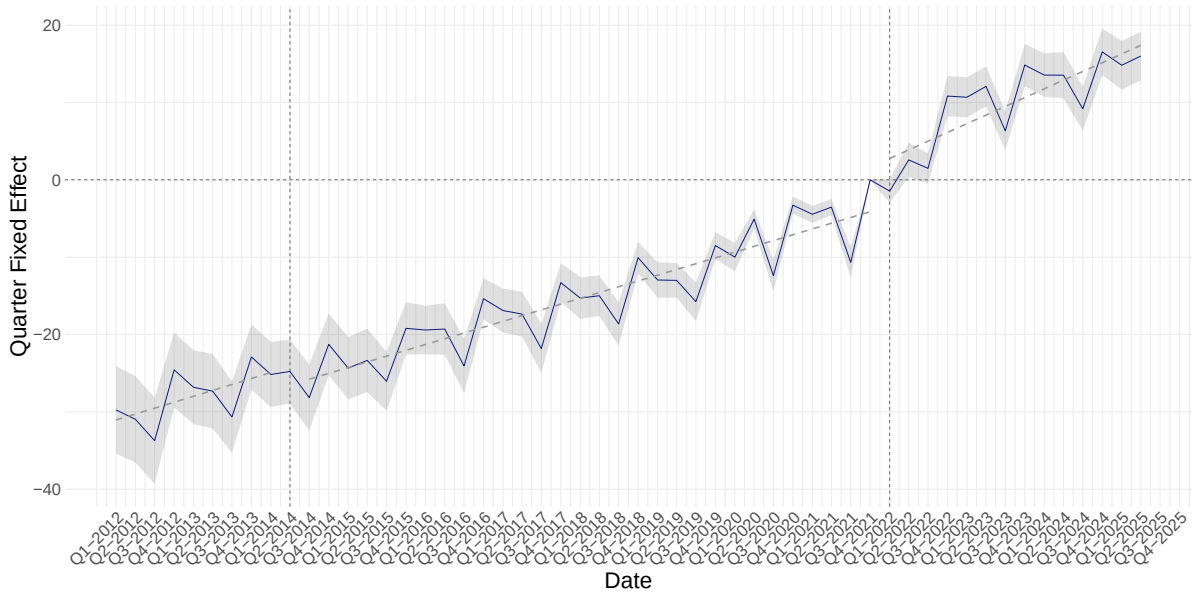


Figure C.9: Quarterly Fixed Effects for the Share of Google Searches in Ukrainian

Notes: The figure plots quarterly time fixed effects, where the outcome is the share of Ukrainian spelling in total google searches for word i in region r and quarter t. The sample includes 198 Ukrainian–Russian word pairs and excludes occupied and partially occupied regions. Observations are weighted by word–region search volume as described in the text. Standard errors are clustered at the word–region level; whiskers denote 95% confidence intervals.

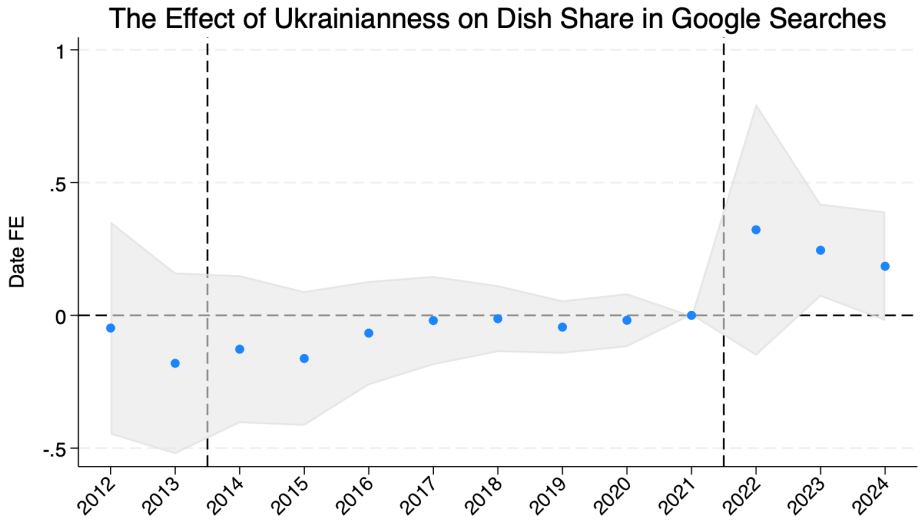


Figure C.10: Cuisine searches: effect of dish Ukrainianness on dish share (standardized outcome).

Notes: The figure reports yearly event-study coefficients from the specification 6 but using the standardized outcome $Pop^{std}_{irt} = \frac{Pop^{raw}_{irt} - \overline{Pop^{raw}_{i,2012\text{–}2021}}}{sd(Pop^{raw}_{i,2012\text{–}2021})}$. Coefficients therefore capture changes in the Ukrainianness gradient relative to 2021 after removing dish-specific scale differences. The model includes dish-by-oblast and oblast-by-month fixed effects. Standard errors are two-way clustered by dish and oblast; whiskers denote 95% confidence intervals.

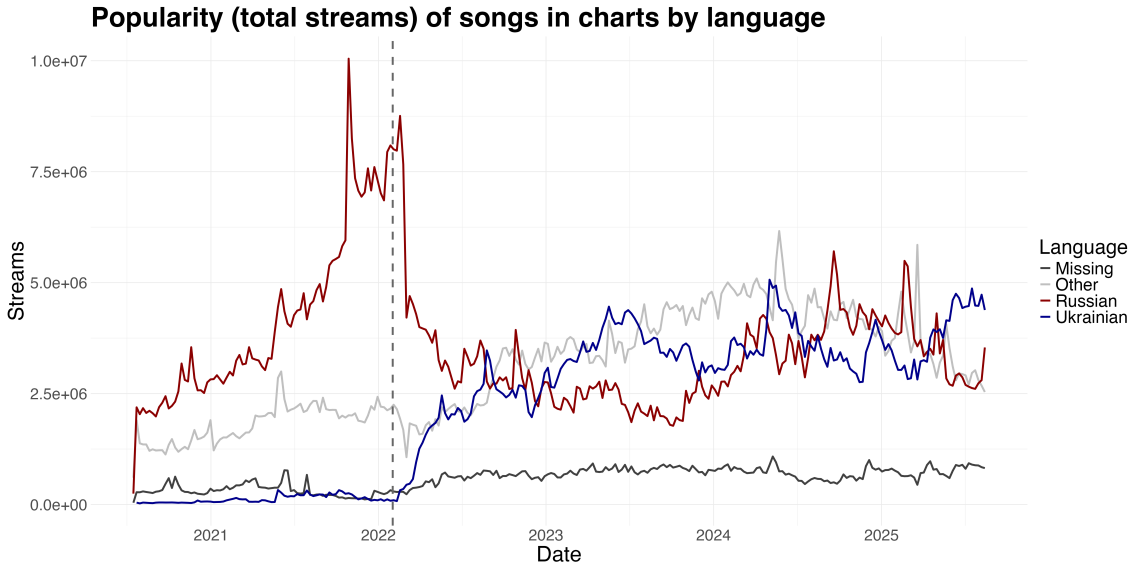
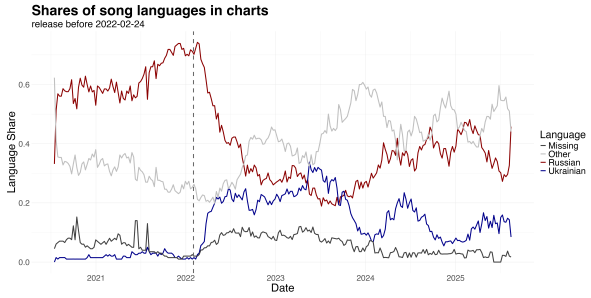
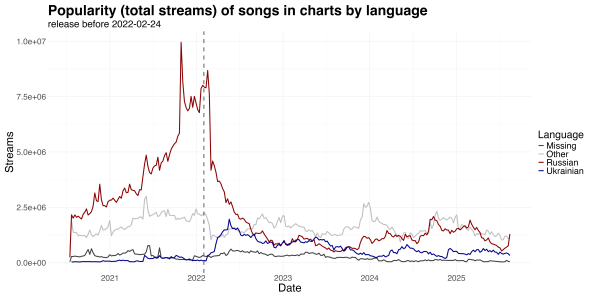


Figure C.11: Spotify Weekly Top Songs Ukraine: Total Weekly Streams by Track Language, 2020–2025

Notes: The figure reports, at the weekly frequency, the total number of streams in the Spotify Weekly Top Songs Ukraine chart by language (Ukrainian, Russian, or other). Track language is determined using lyric-based language detection from Genius; tracks without available lyrics (e.g., instrumentals or songs not documented on Genius) are classified separately when relevant.



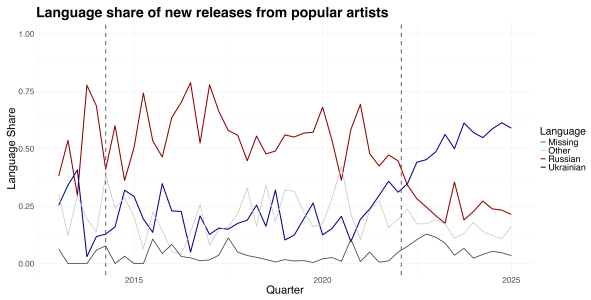
(a) Share of chart entries by language (pre-2022 releases).



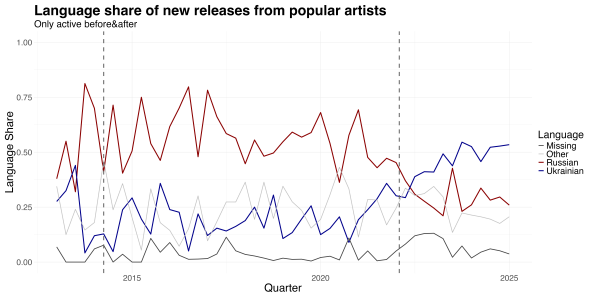
(b) Total weekly streams by language (pre-2022 releases).

Figure C.12: Spotify Weekly Top Songs Ukraine: Language Composition for Tracks Released Before February 24, 2022

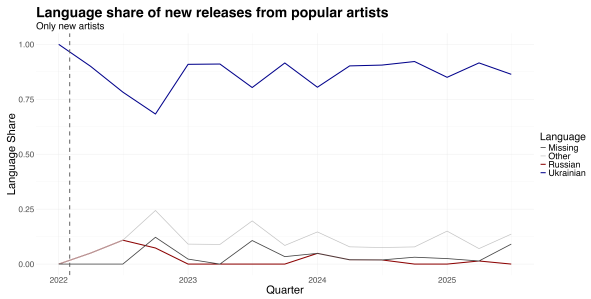
Notes: The figure replicates the language composition analysis restricting the sample to tracks released prior to February 24, 2022. Panel A shows the weekly share of chart entries by language; Panel B aggregates total weekly streams by language group. Track language is assigned using lyric-based detection from Genius. Because the set of songs is fixed to pre-invasion releases, post-2022 changes reflect demand-side reallocation rather than the introduction of new music.



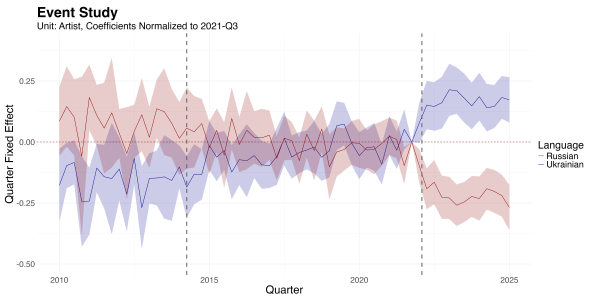
(a) All releases (Ukrainian artists).



(b) Releases by artists active before and after Feb. 24, 2022.



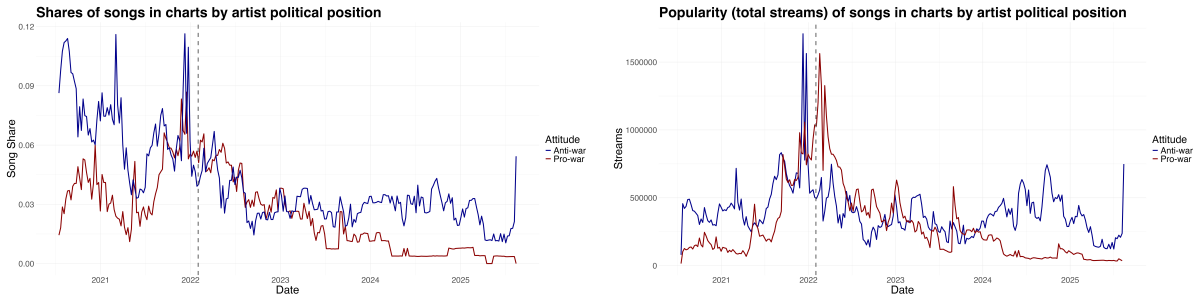
(c) Releases by new artists (first release after Feb. 24, 2022).



(d) Within-artist language shift (artist-level event study).

Figure C.13: Supply-Side Response of Ukrainian Artists: Language of Releases Before and After February 24, 2022

Notes: The figure documents changes in the language of music releases by artists of Ukrainian origin. Panels A–C plot quarterly shares of releases by language (Ukrainian, Russian, other) for: (a) all Ukrainian artists in the sample; (b) artists who released both before and after Feb. 24, 2022 ("active" artists); and (c) artists whose first release occurs after Feb. 24, 2022 ("new" artists). Panel D isolates within-artist changes by estimating an artist fixed-effects regression at the artist–quarter level, where the outcome is the share of an artist's releases in a given language and the coefficients are quarter-by-year time effects normalized to the pre-invasion period; standard errors are clustered at the artist level and caps denote 95% confidence intervals. Across panels, the post-2022 increase in Ukrainian-language releases reflects both the entry of predominantly Ukrainian-language artists and language switching among continuing artists.

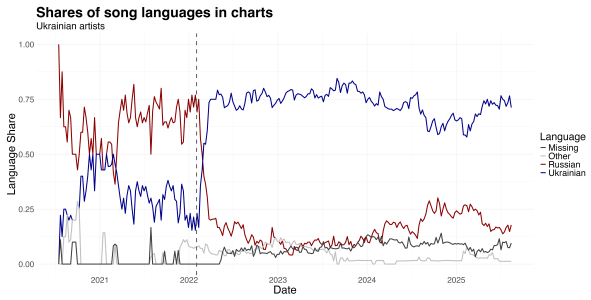


(a) Share of chart entries by artist stance.

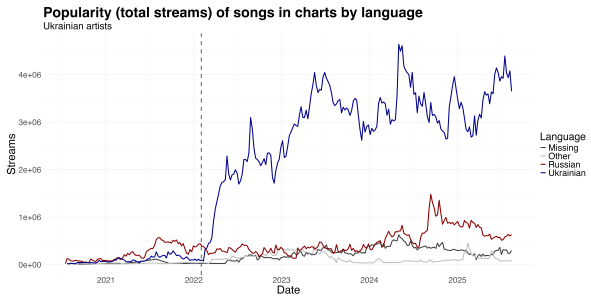
(b) Total weekly streams by artist stance.

Figure C.14: Spotify Weekly Top Songs Ukraine: Popularity of Russian Artists by Stance on the War, 2020–2025

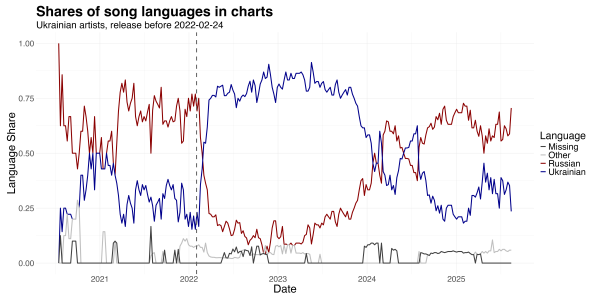
Notes: The figure tracks the popularity in Ukraine of songs by Russian artists classified by their public stance on the war using the Stars About War Project (2025). Panel A shows the weekly share of chart entries accounted for by pro-war and anti-war artists; Panel B aggregates total weekly streams for songs by each group. The underlying data are the Spotify Weekly Top Songs Ukraine charts (July 17, 2020–August 14, 2025). Artist stance is available for a subset of charting Russian artists (18 pro-war and 21 anti-war among artists appearing at least once).



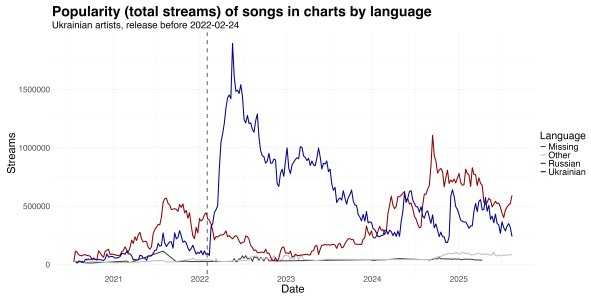
(a) Share of chart entries (all releases).



(b) Total weekly streams (all releases).



(c) Share of chart entries (pre-2022 releases).



(d) Total weekly streams (pre-2022 releases).

Figure C.15: Popularity of Songs by Ukrainian Artists Before and After the Full-Scale Invasion

Notes: The figure reports, at the weekly frequency, the share of chart entries and total streams in the Spotify Weekly Top Songs Ukraine chart for songs performed by artists of Ukrainian origin. Panels A and B use all charting songs. Panels C and D restrict the sample to songs released before February 24, 2022. Shares are computed over chart entries; streams are aggregated within week by language (Ukrainian, Russian, other). Because Panels C and D fix the set of songs to pre-invasion releases, post-2022 changes in those panels reflect shifts in relative demand rather than the introduction of new music.