

“Group Ties amid Industrial Change: Historical Evidence from the Fossil Fuel Industry”
Noah Zucker

Acknowledgements

I thank Allison Carnegie, Richard Clark, Jaclyn Davis, Michael Doyle, Page Fortna, Nikhar Gaikwad, Salif Jaiteh, Amanda Kennard, Cleo O’Brien-Udry, Jack Snyder, Daniel Thomas, Johannes Urpelainen, Ryan Weldzius, the reviewers and editors at *World Politics*, and audiences at Columbia, the London School of Economics, New York University, and the Graduate Student International Political Economy Workshop for helpful comments. The paper also received valuable feedback at the 2021 International Studies Association and Midwest Political Science Association annual conferences.

Replication data for this article is available at Zucker 2022.

Biographical statement

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Keywords

identity politics; fossil fuels; migration; industry

Abstract

Coethnics often work in the same industries. How does this ethnic clustering affect individuals’ political loyalties amid industrial growth and decline? Focusing on migrant groups, I contend that ethnic groups’ distribution across industries alters the political allegiances of their members. When a group is concentrated in a growing industry, economic optimism and resources flow between coethnics, bolstering migrants’ confidence in their economic security and dissuading investments in local political incorporation. When a group is concentrated in a declining industry, these gains dissipate, leading migrants to integrate into outside groups with greater access to political rents. Analyses of immigrants near U.S. coal mines in the early 20th century support this theory. This work shows how ethnic groups’ distribution across industries shapes the evolution of group cleavages and illuminates how decarbonizing transitions away from fossil fuels may reshape identity conflicts.

Members of the same ethnic group often work in some industries more than others. Marginalized groups contend with labor market discrimination that pushes them to industries subject to less bias or with jobs less desirable to dominant groups.¹ Referral networks often lead individuals to join industries employing large numbers of coethnics.² Groups may have cultural or social characteristics that render them likelier to seek and secure employment in certain industries.³ This ethnic segmentation of labor markets can emerge out of stark intergroup divisions. Could ethnic groups' varied exposure to given industries also transform those identity cleavages?

An emergent literature links industrial decline to an accentuation of social divisions, an aggravation of ethnic grievances and polarization of politics along ethnocultural lines.⁴ Economic anxieties, which might result from global market volatility and competition or longer-term processes of deindustrialization, have been associated with growing ethnocentric and right-wing populist movements across Europe and North America.⁵ Industrial contractions drive wedges between identity groups, scholars contend, rallying voters behind policies and politicians pledging to guard their group's social and economic standing.

Much of this literature has focused on the behavior of dominant ethnic groups, such as communities of native-born white Americans, who associate industrial decay with a loss of social status and accordingly take steps to protect the status quo group hierarchy.⁶ Yet members of lower status, politically excluded groups — such as internal and international migrants —

¹ Hechter 1974; Osgood and Peters 2017; Gaikwad and Suryanarayan 2019; Brutger and Guisinger 2021.

² Hiebert 1993.

³ Becker and Pascali 2019.

⁴ Abou-Chadi and Kurer 2021; Ballard-Rosa et al. 2021; Ballard-Rosa, Jensen, and Scheve 2022.

⁵ Rodrik 2018; Ahlquist, Copelovitch, and Walter 2020; Broz, Frieden, and Weymouth 2021; Dehdari 2022.

⁶ Gidron and Hall 2017; Jardina 2019. One exception is Baccini and Weymouth 2021, who also study Black voters in the U.S. while describing this as a topic that “has received very little attention” in the academic literature (550).

have long concentrated in volatile industries. In the early twentieth century, Southern and Eastern European immigrants filled the workforces of many American industries exposed to global economic flux.⁷ Black Americans who moved to northern cities during the Great Migration clustered in jobs subject to uniquely “random” terms of employment.⁸ Manufacturers in the United States, the focus of much recent work on industrial decline and white identity, today employ about three million foreign-born workers.⁹ Migrants across developed and developing countries are closely connected to industries at risk of decline due to the physical impacts of climate change and decarbonization.¹⁰

Here I contend that marginalized groups’ distribution across industries has important implications for the clarity of intergroup boundaries. When an industry is steadily growing, ethnic groups concentrated in that industry reap the benefits of that growth, distributing positive economic information and material resources among their members. This buttresses group members’ sense of economic security and confidence in the ability of their in-group to support their welfare, disincentivizing attempts to secure support from outside sources. When an industry experiences negative shocks, economic anxieties spread through groups concentrated in that industry, eroding confidence in those groups’ ability to offset income losses and guard against future economic risks. Whereas members of dominant groups observing economic loss find receptive politicians upon doubling down on their ethnic identity, members of marginalized groups may instead be inclined to join outside groups offering access to lucrative political

⁷ Cohen 2014.

⁸ Wilkerson 2010, 334.

⁹ Estimate by author based on 2019 American Community Survey (Ruggles et al. 2021*b*).

¹⁰ See, e.g., Das 2014; Hay 2019.

benefits previously out of reach. Concentration in declining industries can weaken, not accentuate, reliance on status quo group ties.

I apply this argument to the coal industry in the early-twentieth century U.S., an era of stark interethnic division and substantial market volatility. I focus specifically on European immigrants working in and around coal mines, who were situated in dense ethnic enclaves that circulated both information and material resources. Using complete-count U.S. census records linked over time and newly transcribed data on local coal production, I trace how immigrants pursued political incorporation — naturalized U.S. citizenship amid local coal growth and decline. For immigrants in the early-twentieth century U.S., citizenship granted access to the franchise and in turn benefits from politicians and the government.

I find that varied ethnic concentration in the coal industry altered naturalization rates among both immigrants working in coal mines and those employed elsewhere, but in distinct ways according to conditions in local mines. When local production was steadily growing, clear cleavages emerged between immigrant groups: members of groups initially more concentrated in the industry were substantially less likely than others to invest in political incorporation. Yet when negative shocks buffeted local mines, these intergroup differences narrowed, with group concentration in the industry no longer constraining naturalization among immigrant miners or coethnics outside the industry.

These dynamics were most evident for immigrants deeply embedded in their ethnic enclave, underscoring the powerful implications of industrial change for status quo group relations and patterns of naturalization. Exploiting variation in mines' political contexts, I also find that these shifts were most pronounced where meaningful political influence was within immigrants' reach. There is little evidence of increased naturalization in areas where access to

the franchise would have yielded few benefits, pointing to the political motivations of naturalizing immigrants. Additional tests indicate that these results are not an artifact of immigrants less inclined to naturalize selecting into more productive mining areas.

This paper offers several contributions to scholarship on economic change and identity. While much recent scholarship has focused on the responses of politically privileged groups to industrial decline, this paper shifts attention to disadvantaged groups. In doing so, the paper illuminates how stable growth can deepen existing group dependencies while economic instability disrupts them. While incumbent group ties may shape the initial experience of economic threats,¹¹ reliance on those same ties can be weakened as industries contract, eroding the explanatory power of initial social groupings. In making this argument, I contribute to the literature detailing the situational nature and economic sources of group allegiances, including migrants' assimilation decisions.¹² I identify heretofore underappreciated determinants of individuals' reliance on their ethnic group and migrants' connections to local polities: identity groups' distribution across industries. Group ties not only shape experiences of industrial flux; they themselves can be reconstituted by it.

This paper also adds to our understanding of when migrants forgo investments in political integration. Scholars have identified a rich set of determinants of political incorporation, including mobilization by political elites and the ease of surmounting bureaucratic hurdles.¹³

¹¹ Mansfield and Mutz 2009; Guisinger 2017; Alt et al. 2021; Baccini and Weymouth 2021.

¹² Patterson 1975; Malkki 1995; Laitin 1998; Brubaker 2002; Posner 2004; Wilkinson 2004; Eifert, Miguel, and Posner 2010.

¹³ Dancygier 2017; Gaikwad and Nellis 2021. Political incorporation (or integration) indicates migrants' political engagement in a destination country or community. For cross-national immigrants, this may resemble naturalization, particularly in destination countries where only citizens can vote. For internal migrants, this may instead involve registering to vote in the local elections of destination communities.

Alongside these factors, the distribution of ethnic groups across industries shapes how migrants perceive their own economic security and invest in attaining greater political voice. Relatedly, this work speaks to the literature on when ethnically diverse migrants politically unify or divide in destination communities. Scholars have found that migrants often unify along class lines at the workplace.¹⁴ This paper underscores the conditional nature of this tendency: in periods of steady growth, immigrants in the same mines varied widely in their propensity to naturalize; it was only amid decline that differences in political engagement across groups evened out.

Group Ties amid Industrial Growth and Decline

Social identities serve as prisms through which individuals interpret and respond to economic threats. People may hold sociotropic attitudes, for example, that attune them to the welfare of compatriots or coethnics.¹⁵ Yet these identities are pliable, varying in salience by political and economic context.¹⁶ Politicians in competitive electoral settings may instrumentally accentuate ethnic divides.¹⁷ Individuals may associate with high-status groups to compensate for economic losses.¹⁸ While group identities may moderate experiences of economic change, they themselves are subject to change.

In this section, I propose that ethnic groups' distribution across industries — their concentration in certain industries more than others — is an important determinant of the

¹⁴ Katznelson 1981; Thachil 2017.

¹⁵ Mansfield and Mutz 2009; Guisinger 2017; Jardina 2019; Baccini and Weymouth 2021; Suryanarayan and White 2021.

¹⁶ Laitin 1998.

¹⁷ Posner 2004; Wilkinson 2004; Eifert, Miguel, and Posner 2010.

¹⁸ Shayo 2009.

political allegiances of their members. In contrast to much extant scholarship, I analyze politically marginalized groups, focusing specifically on migrant groups that have long contended with issues of political exclusion.¹⁹ Whereas scholars have argued that economic decline reinforces individuals' ethnic identities, I instead contend that among marginalized groups, dependence on coethnics can be strongest in contexts of consistent economic growth. Group concentration in growing industries affirms ethnic loyalties; concentration in declining industries causes individuals to look elsewhere for alternative sources of support.

Ethnic Concentration in Industry

Consider a world with two ethnically distinct migrant groups, segregated into separate ethnic enclaves. Social ties among coethnics transmit information on the state of the economy and material resources, as is common among migrant groups.²⁰ Resource transfers, sustained by high levels of social capital and reciprocity, encompass bilateral extensions of credit and the provision of employment opportunities between coethnics. They also include quasi-institutionalized risk-sharing arrangements, such as mutual aid societies and fraternal insurance associations, that provide an informal safety net for ingroup members experiencing losses of income.²¹ These groups are politically disenfranchised, lacking the ability to vote or easily attract

¹⁹ Gaikwad and Nellis 2021.

²⁰ E.g., Garcia 2005. Ethnic groups may be especially adept at resource sharing due to the ease of sanctioning non-cooperative behavior (Fearon and Laitin 1996).

²¹ Scott 1976; Putnam, Leonardi, and Nanetti 1993; Munshi 2014. Resource-sharing technologies are typically built on top of existing social networks and accordingly are often poorly diversified economically (Fafchamps and Gubert 2007).

economic support from the government, and are differentially distributed across industries in their local economy.

[FIGURE 1 ABOUT HERE]

Figure 1: Depictions of two hypothetical ethnic groups (enclaves): a group concentrated in a single industry (Red industry) on the left, a group dispersed across other industries on the right. Cells colored black work in the Red industry; those colored gray work elsewhere.

Figure 1 depicts these two hypothetical groups. In this illustration, each cell represents a worker. Black cells are employed in a single local industry (the “Red industry”), while gray cells work in a mix of other industries. While both groups are the same size, they differ in their concentration in or exposure to the Red industry: half of the workers in Group A are employed in the Red industry, compared to just eight percent in Group B. Because these groups vary in their concentration in the Red industry, they experience the same industrial conditions in distinct ways. I argue that this affects how individuals relate to their group and to outgroups.

Ethnic Concentration amid Steady Growth

When the Red industry is steadily growing, workers in that industry receive consistent streams of income. They consequently spread news of good industrial conditions to coethnics in their enclave, transmitting information that highlights their own economic well-being and the health of local labor markets. These industry workers further ably provide material, financial

support to coethnic peers as needed and pay into any of the more institutionalized resource-sharing mechanisms their group contains.

While workers belonging to both ethnic groups enjoy such benefits of growth, the extent to which news of their employment and material resources spread to coethnics depends crucially on each group's concentration in the industry. Because Group A is more concentrated in the Red industry than Group B, members of Group A will on average be more socially proximate to workers in the Red industry, either maintaining direct connections with such workers or being just a couple of degrees removed. All else being equal, members of Group A should accordingly be likelier than members of Group B to receive information and resources from workers in the Red industry. Moreover, because a greater share of Group A is employed in the Red industry, the resource-sharing mechanisms contained by Group A should be enriched to a greater extent than those offered by Group B: Group A's many workers in the Red industry are able to contribute resources to the group, helping offset any idiosyncratic income losses among coethnics.

Because of this varied exposure to workers in the Red industry, differences in the integrity of Group A and Group B should emerge when the Red industry is experiencing steady growth. Individuals who receive optimistic economic information from their peers — information indicating that jobs are plentiful — should become more confident in their own economic standing and less concerned about future labor market risks.²² Likewise, individuals who receive adequate material support from coethnics or from group-level mechanisms should become more assured of their group's ability to effectively manage economic risks and offset future losses of income. Given that these pieces of information and resources diffuse more

²² Individuals' employment statuses shape their peers' views of the economy and of their own economic security. See, e.g., Alt et al. 2021.

widely across Group A, members of Group A should on average be *more confident in their coethnics' ability to support their welfare* than members of Group B. I expect this to be the case for both members of Group A employed in the Red industry and those employed elsewhere: while industry workers send information and resources to peers, they also receive information from coethnic coworkers and become better able to access support in the case of an idiosyncratic shock, bolstering confidence in their ethnic group and attenuating fears of economic risks.²³

For migrants, this confidence should manifest as less investment in political integration. Political incorporation can generate substantial economic benefits, including the ability to attract social services and employment assistance, access to political rents from parties and political elites (e.g., infrastructure investments, public and private sector jobs, business licenses, favors before municipal boards), and the right to press electorally for expansions of formal welfare programs, particularly where migrants are electorally pivotal.²⁴ However, successfully reaping the benefits of political incorporation particularly for ostracized ethnic groups — involves surmounting barriers that range from legal obstacles and onerous bureaucratic requirements to a lack of political information to hostile native populations.²⁵ Though members of Group A and Group B may equally enjoy the material returns to political incorporation, I expect that migrants in Group A more confident in their economic security and trusting of the welfare supports

²³ Idiosyncratic shocks being those that occur independently of broad conditions in the industry (e.g., workplace injuries).

²⁴ Dancygier 2010; Gaikwad and Nellis 2021; Walter 2010; Shertzer 2016. Political incorporation or naturalization is sometimes a prerequisite for accessing public welfare (Van Hook, Brown, and Bean 2006). In the absence of formal welfare states, citizens may also have an easier time accessing private charity (Cohen 2014, 56–57). On forms of political rents, see, e.g., Shertzer 2016.

²⁵ Goodman 2012; Gaikwad and Nellis 2021; Pons and Liegey 2019; Bhavnani and Lacina 2015.

furnished by coethnics — will be less willing to invest in achieving those benefits, content to remain reliant on their group for economic protection.

Ethnic Concentration amid Decline

Suppose that the Red industry is contracting, experiencing either consistent secular decline or intermittent negative shocks (“busts”). Instead of earning steady streams of income, workers in the Red industry now see pay cuts, reductions in working days, or outright job loss. Whereas peers of workers in a growing industry receive positive economic information, acquaintances of workers in an industry undergoing steady decay or contending with negative shocks instead observe job loss and economic pain, accentuating perceptions of economic vulnerability and sowing doubt over their future economic prospects.²⁶ Workers in the Red industry, rather than ably providing material support to coethnics, now seek out material support from their group to help smooth over income losses.

As in the case of industrial growth, the spread of “pessimistic” information and demands for support depends on each group’s concentration in the Red industry. In the group more concentrated in the Red industry, more individuals will observe, either directly or indirectly, coethnics falling on hard times and receive requests for support from coethnics. Resource-sharing systems will similarly be strained in the more exposed group, with decline amounting to a correlated shock to group members.²⁷ As more members place demands on the group for support, the ability of the group to compensate each member declines, depriving both Red

²⁶ Alt et al. 2021.

²⁷ Concentration in an industry implies a concentration of risk in that industry.

industry workers and their coethnics elsewhere of the ability to offset losses of income. While individuals' first recourse amid an economic shock may be to look to in-group members, group concentration in a declining industry erodes this option. Decline accordingly portends a loss of the "privileges" of concentration in an industry.

I argue above that group concentration in a steadily growing industry suppresses migrants' interest in political incorporation by bolstering their perceived economic security. This constraining effect should break down amid negative shocks, however, as migrants in more exposed groups become more doubtful of their economic security and skeptical of their groups' capacity to effectively ensure their welfare moving forward. While members of groups concentrated in growing industries are content to remain dependent on their coethnics for support, members of groups concentrated in declining industries should instead increasingly look beyond their coethnics for more durable sources of economic support, such as those which accompany political incorporation.

I do not argue that such migrants will wholly exit their ethnic group, severing ties with coethnics or moving away from their group's cultural traditions. Rather, they should seek to *lessen their reliance* on the tenuous resource-sharing mechanisms contained by their group, diversifying the economic backstops to which they have access. Absent an ability to confidently lean on coethnics, migrants concentrated in declining industries should be more willing to bear the costs of political incorporation in pursuit of government support.²⁸

²⁸ This is not to say that political incorporation is the only option for lessening reliance on local coethnics. Migrants may alternatively pursue outmigration or return migration, for example, but migration — itself a risk-laden endeavor (Bryan, Chowdhury, and Mobarak 2014) — may not be as appealing a means of mitigating future economic risks. Additionally, dissatisfaction with informal ethnic resource-sharing systems may be "sticky." Migrants may remain wary of relying on coethnics even after finding work outside the area of industrial decline.

It is important to note here a key difference between marginalized groups, such as these hypothetical migrant groups, and politically privileged groups. While issues of concentration in a declining industry may similarly afflict marginalized and advantaged groups, their recourses to government support differ. By virtue of their political privilege, advantaged groups can often find politicians eager to champion their cause in government. Thus, members of privileged groups may find that looking inwards, emphasizing their ethnic identity and “circling the wagons” around their group, is politically profitable in times of economic stress, as recent work on ethnocentric political movements suggests.²⁹ Members of marginalized groups, which lack equivalent patrons in government, may instead be driven to engage more with outside groups to achieve greater political sway.

In sum, there is theoretical reason to think that ethnic groups’ distribution across industries affects the allegiances of their members, but in ways critically dependent on conditions within those industries. When an industry steadily grows, ethnic groups should vary widely in rates of political incorporation: migrants with greater group exposure to the industry should see less incentive to invest in integrating into the local body politic, confident in the informal insurance backstops provided by coethnics. When an industry declines, these divergent rates of incorporation should narrow as the gains from concentration in the industry dissipate. These shifts should be particularly pronounced in areas where political participation can be expected to yield lucrative material benefits.

²⁹ Gidron and Hall 2017; Jardina 2019; Baccini and Weymouth 2021.

Hypothesis. *Group concentration in an industry should suppress political incorporation in periods of steady growth but increasingly less so when that industry experiences decline, particularly where the benefits of political participation are more plentiful.*

Application to Coal

In the following section, I apply this theory to European immigrants in the early twentieth century U.S., focusing on those proximate to the country's coal industry. This is an appealing test case for several reasons. The many immigrants in and around coal mines lived in dense ethnic enclaves that spread information and resources among coethnics. The coal industry generally grew during this period, but like the modern fossil fuel industry was highly volatile and subject to frequent negative shocks. Moreover, the geography of the coal industry — its sprawl across several states — provides an empirical opportunity: as immigrants' access to political power varied widely across coalfields, I can evaluate how immigrants' behavior differed with the economic returns to political incorporation (access to political rents).

Coal, like any industry, had unique qualities. Yet this case should nonetheless yield generalizable insights into the consequences of ethnic groups' uneven distribution across industries, especially for politically excluded migrants and in settings with weak formal welfare institutions. For example, this case may generalize to manufacturing industries in the early twentieth century U.S., which were similarly encompassed by dense ethnic enclaves,³⁰ as well as

³⁰ Cohen 2014.

to industries in much of the developing world today, which often feature large numbers of migrant workers and truncated welfare states.³¹

There is also reason to focus specifically on fossil fuel industries. To date, much of the work on economic shocks has focused on manufacturing, particularly in the wake of increased Chinese import competition.³² Yet fossil fuels have long been marked by pronounced boom-bust cycles and are today under pressure from efforts to arrest the pace of global warming. With contemporary transitions away from fossil fuels emerging as a core political issue, past instances of decline may shed light on how such transitions will proceed in the years ahead.³³ Fossil fuel industries continue to employ large numbers of migrants and members of other marginalized groups, who may shape how the future politics of climate change unfold. While generalizable, there is also value in considering the case of coal for its own sake.³⁴

Case of Coal in the Early Twentieth Century

Coal was the world's primary energy source in the early twentieth century and accordingly one of its most consequential and politically powerful industries.³⁵ Because mechanization had not yet spread widely, mining was highly labor intensive in these years. In 1920, nearly one million people in the U.S., one percent of the country's total population, reported an occupation in coal mining.³⁶

³¹ Thachil 2017; Holland 2018.

³² E.g., Autor, Dorn, and Hanson 2013.

³³ Colgan, Green, and Hale 2021.

³⁴ Cf. Gailmard 2021.

³⁵ Mitchell 2011.

³⁶ U.S. Bureau of the Census 1975.

While it was generally a period of growth in the industry, top-line figures mask volatility at the local level, where production varied widely across space and time due to changes in local market conditions, breakdowns in mine infrastructure, and local strike activity all exacerbated by seasonal cycles in the demand for coal. Because coal was used for most industrial activity and was a popular residential heating fuel, the industry was also susceptible to swings in the national and global economy, which were commonplace at the time. The U.S. economy experienced six contractions between 1900 and 1920;³⁷ a sharp recession in the early 1920s brought about by the end of World War I and the Spanish Flu pandemic coincided with a 40–50% decline in U.S. coal production.³⁸ To relieve such pressures, mine operators typically looked to cut labor costs.³⁹

The early twentieth century comprised the tail end of the Age of Mass Migration, a period during which thirty million Europeans emigrated to the U.S. and the foreign-born share of the country's population grew to more than 14%. The surge in inward migration was fueled partly by industrial lobbies who sought open immigration policies and actively enticed new arrivals to join their workforces.⁴⁰ European immigrants, unlike those from Asia and elsewhere, were largely unencumbered by legal restrictions until the late 1910s and 1920s.⁴¹

Many immigrants found themselves working in or around coal mines shortly after arriving in eastern port cities. Of the more than 220,000 Southern and Eastern European men who emigrated in 1909, for example, about 8% were working in coal mining by 1910. That year, European immigrants comprised 48% the country's coal mine workforce,⁴² helping make the

³⁷ *NBER* 2021.

³⁸ U.S. Bureau of the Census 1957, 358–359.

³⁹ Andrews 2008.

⁴⁰ Peters 2017.

⁴¹ Abramitzky and Boustan 2017.

⁴² Author's analysis of complete-count census data (Ruggles et al. 2019).

United Mine Workers of America “the most ethnically and racially diverse union in the U.S. labor movement.”⁴³ In the largest coalfields, immigrant workers often outnumbered native workers by wide margins. In Pennsylvania’s Luzerne County, then the largest coal mining county in the country, European immigrants outnumbered native white miners by nearly eight to one; in neighboring Lackawanna County, the ratio was ten to one. Virtually all coal mining counties had some European immigrants present. Accounts from this period suggest that this was not coincidental; many mines featured immigrant bosses who saw coethnics as more reliable and harder working. One miner recalled that bosses in his area preferred Italian workers because they knew they would “produce that coal.”⁴⁴

Ethnic compositions of coal mines varied widely, determined largely by the idiosyncratic preferences of local mine operators.⁴⁵ Mine operators principally utilized the padrone system to find workers, hiring middlemen — often longer-term immigrants — to entice recent arrivals in cities like New York and Philadelphia to coalfields on the country’s interior. Operators placed advertisements in foreign-language newspapers in immigrant-heavy eastern cities as well. The subsequent communication of job opportunities between coethnics further brought new workers to coalfields.⁴⁶

Ethnic Enclaves in Coal Country

⁴³ Trotter 2015, 152.

⁴⁴ Delpont 1986.

⁴⁵ Shifflett 1991.

⁴⁶ Cantrell 1988; Fishback 1992.

Dense ethnic enclaves helped immigrants cope with the economic instability of the time. As in cities, coal towns were marked by high levels of interethnic segregation and animus, with immigrant groups separated from each other and from native citizens socially and spatially; ethnic enclaves were characteristic of coal towns.⁴⁷ Yet these communities also featured high levels of within-group solidarity, with mutual aid societies, fraternal insurance associations, and ethnic congregations marking many immigrant enclaves even in more rural areas. Across coalfields, these ethnic organizations were central to life around mines. Such ethnic ties and communications of job openings across them were often what drew immigrants to mines in the first place.⁴⁸

With few formal welfare protections, the informal institutions within ethnic enclaves provided important resource-sharing functions for immigrants in coal communities. Even in contexts of high labor mobility,⁴⁹ these mechanisms were a primary means by which immigrants accessed welfare and credit.⁵⁰ Via these institutions and personal encounters, immigrants were attuned and responsive to the economic welfare of nearby coethnics.⁵¹ Immigrants paid monthly dues or made voluntary donations to ethnic organizations, which were then pooled and redistributed to members “in cases of sickness, accidents, or distress” or following deaths of

⁴⁷ Cantrell 1988.

⁴⁸ Shifflett 1991; Fishback 1992; Beik 2006.

⁴⁹ The early 20th century is regarded as an era of high labor mobility (Hiscox 2001). This labor mobility extended to the coal industry (Cantrell 1988; Fishback 1992; Andrews 2008).

⁵⁰ Cohen 2014.

⁵¹ As recounted by Cohen 2014 (58), when immigrant women “saw a woman in the butcher shop or the grocery store buying sparingly, they typically ‘would go to a few neighbors, collect money and bring food, and put it under the door and walk away.’” Other immigrants “alerted their parish priest or church societies to neighbors in need. In their own distinctive ways, people tried to watch out for their own.”

family members.⁵² These insurance functions were distinctly important near coal mines, where injuries and deadly accidents were common, especially among immigrants.⁵³ Coethnics additionally helped to diffuse the costs of production interruptions and wage fluctuations. In Colorado, for example, miners carefully distributed shifts amongst themselves when work opportunities became scarce.⁵⁴

For male European immigrants, there was a persistent option of initiating naturalization proceedings; women were unable to independently naturalize until 1922. After a short period in the U.S., men were permitted to declare their intent to become U.S. citizens in naturalization court (“declarations of intention”). After at least five years in the U.S., they could petition for naturalization — a request typically granted by immigration courts.⁵⁵ There was little legal imperative to naturalize beyond its granting of the right to vote; naturalization was an act of political incorporation and means of securing political rents and favorable representation in government.⁵⁶ Non-citizen immigrants in coal mining areas largely lacked the right to vote. While naturalization was not costless — it required an understanding of U.S. civics and English, the ability to travel long distances to government offices — the benefits were substantial.⁵⁷ Naturalization, and subsequent enfranchisement, was a primary means by which immigrants

⁵² Cantrell 1988; Beik 2006. Quote from the charter of a Polish association in Pennsylvania (Beik 2006, 125).

⁵³ Fishback 1992.

⁵⁴ Andrews 2008, 171.

⁵⁵ Biavaschi, Giulietti, and Siddique 2017, fn. 10.

⁵⁶ In some cases, naturalization may yield labor market benefits distinct from political rents (Bratsberg, Ragan, and Nasir 2002). In the early 20th century U.S., the labor market benefits of assimilation were generally not accessed via legal naturalization. Checks of workers’ legal statuses and deportations were largely absent at this time (Kanstroom 2007). Rather, these benefits were accrued via forms of socio-cultural assimilation, such as the adoption of Americanized names (Biavaschi, Giulietti, and Siddique 2017).

⁵⁷ Naturalization has been associated with a weakening of ethnic identification (Jones-Correa 1998).

accessed state support, such as via the provision of public sector jobs or investments in certain communities. In competitive electoral districts, politicians sometimes actively encouraged immigrants to naturalize and vote.⁵⁸ Notably, European immigrants at this time had uniquely pro-welfare preferences,⁵⁹ which they were able to act upon electorally once naturalized. My interpretation of naturalization as an indicator of political incorporation corresponds with work finding that naturalization catalyzes migrant political participation.⁶⁰

Citizenship in American Coalfields

The political contours of the coal industry varied widely across the country, with immigrants' access to political power depending largely on the mine at which they worked. In much of central Appalachia, miners were denied meaningful access to the franchise. The labor leader Samuel Gompers described coalfields in West Virginia in the early 1900s as “the last remains of industrial autocracy in America.”⁶¹ Mine operators maintained a tight grip over life in their company towns, acting as unfettered political machines. The flow of political information was carefully controlled. Company guards often flagrantly coerced workers into voting the company line, sometimes simply handing miners prefilled ballots. In no way were “citizens there allowed [...] to express their preference in these elections,” reported Department of Justice

⁵⁸ Kleppner 1987; Cohen 2014. The provision of political rents was closely tied to naturalized citizens' exercise of political voice (Shertzer 2016). Cf. Dancygier 2017.

⁵⁹ Giuliano and Tabellini 2020.

⁶⁰ Hainmueller, Hangartner, and Pietrantuono 2015, 2017. Hainmueller, Hangartner, and Pietrantuono 2017 notably find that the positive effects of naturalization on participation are strongest for the most marginalized migrant groups.

⁶¹ Lambert 2018, 80.

officials at the time.⁶² Similar conditions prevailed in western states, the setting for Upton Sinclair’s *King Coal*, where miners lived in isolated company camps “carefully designed to inculcate subservience and loyalty.”⁶³

Elsewhere, workers enjoyed greater political autonomy. In Pennsylvania, then the heart of the coal industry, miners were active in local political life. Miners were, for example, involved in the establishment of the labor-oriented Greenback Party in the 1870s.⁶⁴ They ran for local political office, with a seat in government providing an avenue for advancing their interests that was seen as more reliable and potentially more profitable than a strategy of labor strikes and direct confrontations with mine operators. Enfranchised miners had their poll taxes paid by local power brokers and, as with immigrants elsewhere, enjoyed access to the services provided by partisan patronage networks.⁶⁵ In other coalfields, from Alabama to Illinois, miners were similarly highly attentive to local and national politics, seeking to assert their political agency with frequent debate about the candidates who would best advance the workers’ cause. When under economic pressure, miners “pinned their hopes for change on the ballot box.”⁶⁶

When local mines were rapidly or steadily growing — avoiding negative production shocks — immigrants with greater group exposure to the industry should have felt less need to

⁶² Corbin 2015, 11–12.

⁶³ Andrews 2008, 197.

⁶⁴ French 1981.

⁶⁵ Sterne 2001; Arnold 2014. Political parties and elites may have mobilized immigrants in contexts of coal decline. Elite mobilization and immigrant choice as drivers of naturalization are theoretically and empirically similar. When immigrants are interested in naturalizing, parties may compete to then mobilize them into their camp (Dancygier 2017). When parties want to mobilize new voters, immigrants may be increasingly attracted by the rents on offer (Shertzer 2016).

⁶⁶ Caldemeyer 2021, 161. Economic scarcity may sometimes ignite immigrant-native conflict (Dancygier 2010). However, nativism in the early 20th century U.S. was largely disconnected from issues of economic competition (Tabellini 2020).

invest in naturalization. In contexts of coal shocks, exposure to local mines should have led such immigrants to increasingly seek the secure benefits of citizenship.⁶⁷ Based on the above theory, we should expect that *group concentration in coal suppressed naturalization in periods of steady growth, but increasingly less so amid decline.*

Naturalization is sometimes treated as part of suite of assimilation outcomes, alongside indicators of social or cultural assimilation.⁶⁸ However, naturalization was distinct from social assimilation into the native white populace.⁶⁹ If immigrants were motivated by the political benefits of naturalization, as opposed to a general desire to socially assimilate or obtain the status benefits of national identification,⁷⁰ we should observe the greatest variation in naturalization rates in areas where immigrants could meaningfully exercise political voice — areas where workers enjoyed greater political autonomy and where elections were relatively competitive. This leads us to expect that *the conditional relationship between group concentration and naturalization was most apparent in areas where the benefits of political participation were most lucrative.*

Empirical Strategy

I test these hypotheses with individual-level data on immigrant naturalization and county-level data on coal production. Using complete-count decennial U.S. census records between

⁶⁷ Industrial decline may sometimes diminish the total pool of political rents by reducing government income. This was unlikely a major factor in the early 20th century, which featured little corporate taxation (*Tax Foundation* 2012) and generally was a period of growth in coal.

⁶⁸ E.g., Fouka 2019; Fouka, Mazumder, and Tabellini 2021.

⁶⁹ Sterne 2001; Beik 2006.

⁷⁰ Cf. Shayo 2009.

1900 and 1920,⁷¹ I trace how single individuals naturalized over time. I compare immigrants within counties and states, leveraging variation in ethnic groups' concentration in nearby mines to assess how naturalization rates diverged as those mines grew and declined.

To track immigrants' behavior, I rely on recently devised automated methods for linking single individuals across multiple digitized censuses. I draw linkages from the new IPUMS Multigenerational Longitudinal Panel (MLP).⁷² The IPUMS MLP builds on prior census linking efforts and is appealing in that it produces substantially more linkages without a loss in accuracy and can link both men and women. Earlier methods relied largely on individuals' names, which complicated the linking of women due to the custom of changing surnames upon marriage. With this method, I can track even immigrants who moved around the U.S. between censuses.

I use two sets of census linkages — 1900 to 1910 and 1910 to 1920 — that I stack into a single dataset for analysis purposes. I focus on the period of 1900–20 due to the prevalence of within-group resource sharing for European immigrants at this time.⁷³ The unit of analysis is the matched individual in a given matching range (see Figure 2).

[FIGURE 2 ABOUT HERE]

Figure 2: Geographic distribution of immigrants in coal counties matched across censuses. *Note:* Immigrants are matched and remain in the sample even if they migrate out of a coal-producing county between censuses.

⁷¹ Ruggles et al. 2019, 2021*a*. The U.S. Census Bureau is the original source of these data.

⁷² Helgertz et al. 2020; Ruggles et al. 2021*a*.

⁷³ Cohen 2014.

While these years featured mounting nativist resistance to European immigration, particularly following World War I, there is little evidence that the degree of nativist animosity faced by immigrants varied with their group's concentration in coal or with shifts in the industry. The cultural origins of nativism in this era produced a disconnect between anti-immigrant backlashes and local economic conditions.⁷⁴ Accordingly, although exposure to nativism encouraged some immigrants to naturalize, this is unlikely to bias the statistical analyses described here.⁷⁵

Variable Measurement

Political incorporation To measure political incorporation, I construct a binary variable that records if a non-citizen immigrant successfully naturalized between consecutive censuses. In a supplementary test, I expand this definition to include declarations of intention to naturalize.

Coal shocks To measure conditions in local coal mines, I transcribe annual coal production data at the county level from editions of *Mineral Resources of the United States*, an historical publication of the U.S. Geological Survey. Using these production data, I construct a continuous measure of the intensity of negative shocks experienced by a county's coal mines between the enumeration of consecutive censuses (sum of all year-over-year percentage declines in that

⁷⁴ Tabellini 2020.

⁷⁵ Fouka 2019. In other words, group concentration in the coal industry generated incentives around naturalization in addition to any produced by nativist backlashes. Supporting this, I find that the results are robust to excluding from the sample German immigrants, who were highly exposed to nativism around World War I (as noted by Fouka 2019). See discussion below of robustness check dropping individual ethnic groups from the sample.

county-decade). Low “shock intensities” indicate that a county’s mines were steadily growing, with minimal intra-decade production declines. High shock intensities indicate that a county’s mines experienced severe negative shocks. I take the square root of this measure. Appendix B contains additional details.

Group concentration To measure immigrants’ group exposure to local coal mining (concentration of ethnic groups in coal), I first classify immigrants into 36 distinct groups based on their places of birth and mother tongues (see Appendix A). Upon classifying immigrants, I record the percentage of workers in each immigrant group employed in coal mining in each county at the start of each decade (ahead of the measurement of coal shocks).⁷⁶ The following equation describes the calculation of this variable for a given group g in county c at time t . Due to its rightward skew, I take its square root.

$$\text{Group concentration}_{cgt} = \sqrt{\frac{\text{Coal miners}_{cgt}}{\text{All workers}_{cgt}}}$$

While immigrants often featured prominently in mines, levels of group concentration varied widely. In 1910, for example, 87% of the 1,297 Austrian immigrant workers in Las Animas County, Colorado, were employed in coal, compared to 65% of Italian immigrants in the

⁷⁶ I define “workers” as individuals for whom an industry of employment is listed in the census; in IPUMS USA datasets (Ruggles et al. 2019), an IND1950 value between 105 and 976. Group concentration is measured at the start of a decade (e.g., 1900). Shocks to coal are measured over the ensuing decade (e.g., 1900–1909). While the timing of the group concentration measure overlaps with the time frame of the coal shock measure, censuses (the source of the group concentration measure) were enumerated early in the year — the true temporal overlap is accordingly minimal.

area. East to Williamson County, Illinois, 96% of Russian immigrants worked in local mines, far more than the 57% of Irish immigrants in those mines. Across 1900 and 1910, the average European immigrant in coal-producing counties had 31% of their local coethnics working in coal.

One concern is that group concentration in coal was not randomly assigned. As I compare immigrants within the same county, my identifying assumption is that within-county variation in groups' exposure to local mines at the start of a decade was independent of performance in those mines over the ensuing decade. In other words, I assume that groups in the same county did not differentially sort into or out of coal mines according to future, yet-to-be-observed production changes in those mines.⁷⁷ I identify little historical qualitative evidence to suggest that this was the case. Further, while I find quantitatively that group concentrations tended to be lower in counties with declining coal industries, I crucially do not find systematic differences between groups in this regard (see Appendix A). Though threats to inference cannot be ruled out entirely, the possible endogeneity of group concentration does not appear to be a major issue.

Covariates The full regression models include a set of individual- and county-level covariates, all based on complete-count census records from the start of a given decade (further details in Appendix C). At the individual level, I condition on an immigrant's first year of emigration to the U.S., as recent immigrants may have been less likely to naturalize than longer-term immigrants. I further condition on whether a given immigrant was living with a spouse, which provides an indication of whether an immigrant intended to stay in the U.S. permanently;

⁷⁷ While coal decline may have reduced group concentration, I measure group concentration prior to the period of decline.

temporary migrants often left behind family in Europe. Immigrants' economic class may have additionally affected the perceived benefits of naturalization; to account for this, I control for an estimate of individuals' employment income. Lastly, I control for an immigrant group's share of a county's population, given work attributing naturalization to group size.⁷⁸

I include four covariates at the county-level. I record each county's reliance on coal mining for each census, measured as the percentage of workers in a county reporting an occupation in coal. I also record the share of residents living in rural areas (as recorded in the census), as well as the Black share of each county's population, which may have affected immigrants' interest in naturalizing.⁷⁹

Finally, I control for the health of a county's non-coal economy to separate coal-specific shocks from instances of general economic decline. To distinguish coal shocks from broader economic shocks, I compute a continuous Bartik estimate of decline in local non-coal economies. Bartik estimates rest on an interaction of local industry shares with national industry-level growth patterns.⁸⁰ Pairing complete-count census data on local employment shares with national-level production data, I calculate and control for negative shocks to non-coal industries for each county-decade under analysis (Appendix C.2). I include this covariate in all models to isolate coal shocks from shocks to the other industries to which the coal industry was connected.⁸¹

⁷⁸ E.g., Shertzer 2016.

⁷⁹ Fouka, Mazumder, and Tabellini 2021.

⁸⁰ Goldsmith-Pinkham, Sorkin, and Swift 2020.

⁸¹ The theory focuses on shocks to particular industries, as opposed to shocks that implicate a broad swath of the economy.

The full dataset is limited to European immigrants (at least 21 years of age) residing in counties actively producing coal at the start of a given decade. Importantly, immigrants remain in the sample even if they moved out of coal-producing counties between censuses. I exclude immigrants in counties where borders were changed during a given decade. This dataset totals 698,809 immigrants matched across census pairs, initially distributed across 318 counties and 23 states. Tests of naturalization are limited to noncitizen immigrants eligible to begin naturalization proceedings (men of at least 21 years of age); other tests involve the remaining observations. About 29% of European immigrants in coal counties were successfully matched, near the high end of typical match rates in the literature⁸² (see Appendix D for details).

Econometric Model

Using these data, I estimate the model

$$Y_{icgs(t+10)} = \boldsymbol{\beta} \left[\text{shock intensity}_{c(t \rightarrow t+9)} \times (\text{group concentration}_{cgt} + \mathbf{W}_{it} + \mathbf{X}_{ct}) \right] + \gamma_c + \delta_{st} + \epsilon_{icgs(t+10)}$$

where i indexes individuals, c counties, g immigrant groups, s states, and t years. $\boldsymbol{\beta}$ is a vector of coefficients, \mathbf{W}_{it} is a vector of individual-level covariates for each census year, \mathbf{X}_{ct} is a vector of county-level covariates for each census year, and $\epsilon_{icgs(t+10)}$ is an error term clustered at the county-group level. I additionally include two fixed effects terms: a county fixed effects term γ_c

⁸² See, e.g., Abramitzky, Boustan, and Eriksson 2014.

and a state-year fixed effects term δ_{st} , which accounts for the distinct political and economic trajectories of different states.⁸³ The outcome $Y_{icgs(t+10)}$ is the naturalization dummy. Single-interaction models can introduce bias by overlooking interactive relationships between the moderator and covariates;⁸⁴ I accordingly estimate this as a fully moderated model. In supplementary tests, I use a “binning estimator” to address potential issues of linear extrapolation and ensure common support in the moderator.⁸⁵ I also estimate models without the full covariate set, eliminating the potential issue of covariate endogeneity.

I estimate this model with weighted least squares. One challenge in using matched census data is biased selection into matching. As is customary, I correct for this by weighting individuals according to their likelihood of having been matched. I compare the sets of matched individuals to the corresponding complete-count censuses (limited to coal-producing counties), predicting each individual’s probability of having been matched according to their age, sex, literacy, place of residence, immigrant status, and occupation (see Appendix C).

Results

Estimation results, with and without the full covariate set, offer support for this paper’s theory. As illustrated in Figure 3, group concentration in coal had a strong negative relationship with political incorporation when local mines were steadily growing. Broad differences between

⁸³ State characteristics may have differed in both levels and trends at this time; state-year fixed effects account for this better than simple year fixed effects (see, e.g., Tabellini 2020).

⁸⁴ Blackwell and Olson 2021.

⁸⁵ Hainmueller, Mummolo, and Xu 2019. Unlike traditional estimators, this “binning estimator” does not force linearity, allowing for more flexible interactive relationships.

ethnic groups in naturalization rates emerged around these steadily growing mines, with such cleavages eroding when negative shocks battered mines. Around the healthiest tercile of mines (lowest shock intensity), a ten-percentage point increase in group concentration corresponded to a 12.5-point decline in the likelihood of attaining citizenship. Yet around the tercile of mines experiencing the most severe shocks, this same difference in group concentration was associated with a mere three-point decline in naturalization (see Appendix G, Figure G7 for further details on tercile tests). This convergence may have been driven by higher rates of naturalization among members of groups concentrated in coal (Appendix E, Table E2).⁸⁶

	Naturalized		
	Model 1	Model 2	
Group concentration	-0.652*** (0.103)	-0.587*** (0.107)	[graphic for Figure 3 here]
Shock intensity	-0.852*** (0.177)	3.312 (2.063)	
Concentration × shock	0.428*** (0.098)	0.487*** (0.112)	
All covariates		✓	
County FEs	✓	✓	
State-year FEs	✓	✓	
N	75056	59503	
Counties	311	298	
Adj. R-squared	0.122	0.170	
***p < .001; **p < .01; *p < .05			

Figure 3: Regressions of the successful naturalization dummy on the interaction of shock intensity and group concentration. Standard errors clustered at the county-group level. 95% confidence intervals are plotted; dashed lines indicate the confidence intervals for the model without all covariates.

⁸⁶ The direct correlation between coal shock intensity and naturalization is less precisely estimated. This is likely due to this county-level measure abstracting away from within-county variation in group behavior, unlike the measure of group concentration.

The theory described above anticipates that these changes in naturalization rates were apparent among both immigrants working in mines and coethnics employed elsewhere. To test this, I distinguish between two sets of immigrants: (a) immigrant miners and (b) those neither working in the industry nor living with any family member in the industry.⁸⁷ The results of these tests, depicted in Figure 4, indicate that ethnic enclaves shaped naturalization rates in and around local mines by transmitting the benefits of growth and costs of decline: group concentration in steadily growing mines suppressed naturalization among both miners themselves and coethnics employed elsewhere.

	Naturalized			
	Immigrant miners Model 1	Model 2	Coal-adjacent immigrants Model 3	Model 4
Group concentration	-0.833*** (0.137)	-0.789*** (0.146)	-0.651*** (0.144)	-0.737*** (0.144)
Shock intensity	-0.717*** (0.204)	10.112** (3.564)	-1.072*** (0.224)	1.313 (2.030)
Concentration × shock	0.536*** (0.151)	0.599*** (0.170)	0.557*** (0.130)	0.670*** (0.144)
All covariates		✓		✓
County FEs	✓	✓	✓	✓
State-year FEs	✓	✓	✓	✓
N	23415	23374	50552	35503
Adj. R-squared	0.106	0.132	0.125	0.188
***p < .001; **p < .01; *p < .05				
[graphic for Figure 4 here]				

Figure 4: Interactions of group concentration and shock intensity on naturalization. Plots on the left limited to immigrants working in coal; those on the right limited to immigrants working

⁸⁷ Family members working in coal are identified using complete-count census records.

outside coal living with no family members in coal. 95% confidence intervals plotted using robust standard errors clustered at the group-county level. Dashed lines indicate the confidence intervals for models without all covariates.

Across both immigrant miners and coal-adjacent immigrants, varying group concentrations in local mines drove clear wedges between immigrants in times of consistent growth. Miners in more exposed groups were far less likely to naturalize than other miners in the same coalfields; in the most steadily growing quintile of mines, a ten-point increase in group exposure suppressed naturalization rates by over 23 percentage points in expectation. Yet these differences were substantially narrower in mines experiencing negative shocks; in the quintile of mines where negative shocks were most severe, that same difference in group concentration corresponded to just an eight-point decline in naturalization for immigrant miners. Among coal-adjacent immigrants, this increase in group concentration was correlated with a 20-point decline in naturalization around consistently growing mines, yet no significant change near sharply declining mines. Note that these results are not an artificial product of linear extrapolation or a lack of common support in the decline moderator (Appendix G, Figure G7).⁸⁸

Political Contexts

The ability of immigrants to access the benefits of political participation varied widely across the country. If immigrants were attracted to the material benefits of citizenship not purely

⁸⁸ Some coal-adjacent immigrants may have been employed in industries dependent upon coal, such as railroads. However, this would not explain variation among coal-adjacent immigrants according to their coethnic exposure to coal.

the status benefits of national identification — we should primarily obtain these baseline results where those material benefits were more accessible.⁸⁹ I test this using two metrics: the partisan makeup of immigrants’ communities and mines’ geographic locations.

I first evaluate immigrants’ partisan context. Mines were often situated in Republican strongholds. Across 1900 and 1910, 52% of immigrant miners were living in Republican-held congressional districts won by more than ten points (see Appendix C for data details). If immigrants were principally motivated by the material benefits of citizenship, changes in naturalization rates should have been most pronounced in more competitive districts. Many immigrants at this time were particularly inclined to naturalize when they were likely to be pivotal voters for the Democratic Party, which promised an enticing mix of patronage and programmatic policy benefits.⁹⁰

[FIGURE 5 ABOUT HERE]

Figure 5: Interactions of group concentration and shock intensity on naturalization. Plots on the left limited to immigrants in competitive districts ($n = 33,942$); those on the right limited to immigrants in Republican strongholds ($n = 37,402$). 95% confidence intervals are plotted using robust standard errors clustered at the group-county level. Dashed lines indicate the confidence intervals for models without all covariates.

⁸⁹ On the status benefits of national identification, see Shayo 2009.

⁹⁰ Shertzer 2016.

To test this, I divide immigrants living in Republican strongholds from those elsewhere.⁹¹ Figure 5 illustrates that the conditional relationship between group concentration and naturalization was strongest in areas where elections were relatively competitive. In these districts, immigrants in groups more concentrated in coal mines were far less likely than others to naturalize in periods of steady growth, but this negative relationship was notably attenuated around mines suffering negative shocks. There is milder evidence of this dynamic in Republican strongholds, indicating that the material benefits of naturalization, independent of any status benefits, were an important motivation for immigrants.

I now consider mines' geographic locations. As described above, immigrants' ability to participate in politics without interference from mine operators varied across the country. In states such as Pennsylvania and Illinois, miners were generally able to engage with nearby communities and in local politics. Elsewhere, namely around central Appalachian and Mountain West mines, immigrants were socially and politically isolated in company towns and camps. In these tests, I accordingly divide immigrants by their state of residence.

[FIGURE 6 ABOUT HERE]

Figure 6: Interactions of group concentration and shock intensity on naturalization. “Central Appalachia and the West” includes Arizona, California, Colorado, Idaho, Kentucky, Montana, Nevada, Oregon, New Mexico, Tennessee, Utah, Virginia, Washington, West Virginia, and Wyoming ($n = 9,227$). Remaining states are grouped together ($n = 70,086$).

⁹¹ I split the sample according to whether the county-level vote share difference between Republican and Democratic candidates for the House of Representatives was greater than the median difference in the sample across 1900 and 1910 (12.6 percentage points). These data were acquired from Clubb et al. 2006.

Figure 6 reveals that in line with expectations, the baseline results principally hold away from more restrictive coalfields. In central Appalachia and the West, where mine operators retained tight control over local elections, I observe no clear changes in naturalization rates with exposure to coal.⁹² Conversely, I obtain the baseline results for immigrants living elsewhere, where voting rights could be more meaningfully exercised. This further supports the notion that immigrants in coalfields were motivated by the material benefits of citizenship, not only the non-material status benefits that could be obtained even in areas where political influence was lacking.⁹³

Position in Ethnic Enclave

The theory laid out above focuses on the spread of information and material resources within ethnic enclaves. Here I evaluate whether naturalization patterns differed between immigrants on the interior of their enclave who principally communicated with coethnics and participated in ethnic communal life, and immigrants on the fringes of their enclave with more exposure to non-coethnics. To approximate the depth of immigrants' integration into their

⁹² One possible objection to this interpretation concerns the small size of this subgroup (9,227 observations), which may be the source of this null result. In a supplementary test, I draw a random set of observations from the larger subgroup ("Elsewhere") to match this smaller sample size. Results persist with this smaller sample, indicating that uneven sample sizes do not underly these varied results (see Appendix E, Table E4).

⁹³ It is possible that immigrants strategically clustered more in counties where political influence was accessible. However, this is unlikely. The primary determinants of immigrants' movement to coalfields were the availability of jobs, recruiting efforts of coal companies, and word of mouth among coethnics which itself principally concerned the availability of jobs (Cantrell 1988). Moreover, immigrants who moved to coal towns generally left communities in which they had more political sway (coastal cities with a major Democratic presence, to interior coalfields that were more Republican). This suggests that immigrants were not strategically seeking out better political conditions in a way that would bias these results.

enclave, I use complete-count census records to identify individuals' likely exposure to non-coethnics at their places of work. To do so, I calculate for each coal-adjacent immigrant the proportion of co-workers who were coethnics.⁹⁴ Immigrants working with more non-coethnic coworkers likely had more outward-facing social ties, making them less reliant on their enclave for information and material support.

Figure 7 shows that the clearest relationship between group concentration and naturalization was among immigrants working with more coethnics, who likely were more tightly connected to their ethnic enclave. There is little evidence of varied group concentrations cleaving immigrants who worked with few coethnics. Being less tied to their enclave, these immigrants were less responsive to shifts in coethnic miners' fortunes despite sharing a common ethnic identity. That these results are most pronounced for immigrants deeply embedded in their ethnic enclave underscores the capacity of industrial changes to modify naturalization decisions.

[FIGURE 7 ABOUT HERE]

Figure 7: Interactions of group concentration and shock intensity on naturalization. Sample divided between coal-adjacent immigrants working in local industries employing more than the median share of coethnic workers (more than 3.9% of co-workers being coethnic; $n = 25,260$) and those working alongside fewer coethnics (at most 3.9% of co-workers being coethnics; $n = 25,292$).

Political Incorporation or Social Assimilation

⁹⁴ "Co-workers" are those who worked in the same industry and same county in the same year.

Collectively, these results show that group concentration in coal was associated with a strengthening of immigrants' reliance on their ethnic enclaves in periods of stable growth, but increasingly less so around mines weakened by negative shocks. Here I evaluate whether group exposure to coal shocks drove immigrants to wholly exit their enclave, severing ties with coethnics, or simply lessen reliance on coethnics via naturalization. To do so, I consider the possibility of social assimilation: migrants' integration into the native white populace or other immigrant groups. Social assimilation yielded some material benefits, such as better labor market outcomes,⁹⁵ which may have been attractive in periods of economic stress. I evaluate this possibility using two metrics: marriage to a non-coethnic (a native white citizen or non-coethnic immigrant) and acquisition of the ability to speak English.

I find little evidence that group concentration in coal was associated with social assimilation across men and women (Appendix F). This may have been due to the difficulty of social assimilation. Unlike naturalization, successful social assimilation required the assent of outgroup members — something that the many Southern and Eastern Europeans in coal towns struggled to achieve.⁹⁶ Rather than fully severing ties to their enclave, migrants with broad group exposure to coal shocks appear to have come to rely less on coethnics without leaving the group entirely.

Alternative Explanations

⁹⁵ Biavaschi, Giulietti, and Siddique 2017.

⁹⁶ European immigrants' interest in social assimilation varied, for example, with the size of local Black populations, but they still generally had trouble being accepted by native groups (Fouka, Mazumder, and Tabellini 2021). The assent of outgroup members was not needed to the same extent for naturalization.

Groups concentrated in growing mines may have included many recent migrants, attracted by the promise of good pay but unlikely to invest in naturalization. Groups concentrated in soon-to-decline mines may have instead been more comprised of longer-term immigrants; by virtue of their length of stay, they may have been likelier to naturalize for reasons independent of their group's concentration in coal. If this the case, the results described above may be due to biased selection in growing and declining mining areas.

While I control for immigrants' year of emigration to the U.S., I attempt to further rule out this explanation by splitting recent immigrants from longer-term immigrants. There is little sign that these two sets of immigrants behaved differently (see Appendix G, Figure G1). Potential selection of recent migrants into growing mining areas does not appear to explain the results described above.

A second alternative explanation concerns the results disaggregating immigrant miners from coal-adjacent immigrants. As immigrants are not observed between the enumeration of two censuses, it is possible that coal-adjacent immigrants began working in the industry sometime during that intervening period. If immigrants were likelier to do this when they belonged to more exposed groups, this may explain the significant results found for coal-adjacent immigrants.

While some coal-adjacent immigrants did enter the industry between censuses, this is unlikely to have biased the results described above. Of immigrants identified as coal-adjacent at the start of a decade, just 9.5% were working in coal by decade's end, compared to 63.6% of the immigrants who had worked in coal since the start of the decade. I further obtain the baseline results when limiting the sample to older immigrants who were unlikely to enter the industry by virtue of their age, as well as when limiting the sample to coal-adjacent immigrants who remained employed outside of coal at the end of a decade (Appendix G, Figure G2).

Robustness Checks

As a placebo test, I evaluate whether immigrant's tendency to naturalize varied with *future* economic contractions in their county.⁹⁷ I find null results as expected, underscoring the unique importance of contemporaneous industrial conditions in shaping the relationship between group concentration and naturalization (Appendix G, Table G1).

Other robustness checks support the main results (see remainder of Appendix G). First, I consider the possibility that the measures of shock intensity are correlated with longer-run growth trends; I find that the results are robust to controlling for intra-decadal growth in local mines and local non-coal industries. Acknowledging the possibility of ethnic ties crossing county borders, I additionally recalculate the group concentration and shock intensity variables to encompass all counties to which immigrants had a direct railroad connection; this test produces commensurate results. I further recode political incorporation to include declarations of intention to naturalize, which likewise yields similar results. I additionally note the possibility of both coal production and naturalization being endogenous to county-specific political and economic conditions. One particular concern is that both production and naturalization were associated with local labor action, given the strength of coal unions in much of the country. To account for this, I exclude county-years that witnessed significant strike activity; results persist. Results are similarly robust to the inclusion of county-census fixed effects (comparing immigrants in the

⁹⁷ For example, whether the link between group concentration and naturalization in 1910–1919 varied with economic conditions in 1920–1929.

same county in the same year). Finally, I exclude the few coal-producing states in which non-citizen immigrants were permitted to vote; results are again robust.

Mechanical checks similarly affirm these results. I re-cluster standard errors at the county level; results remain significant. I re-estimate the interaction models using a binning estimator, ensuring common support in the moderator, which supports the results. I re-estimate the main model, iteratively dropping each county, each ethnic group, and random sets of observations from the sample to check for highly influential outliers; the results persist. I interact the beginning-of-decade covariates with decade fixed effects to allow for differential associations by year (Appendix E, Table E1); results are consistent. Results are also robust when removing observation weights and when replacing square roots with logarithmic transformations.

Conclusion

Economic threats to dominant ethnic groups may prompt individuals to look inwards, fomenting ethnic chauvinism and defensiveness. When we focus on marginalized groups, however, a different logic holds. For such groups, group allegiances may be affirmed by concentration in consistently growing industries and shifted by exposure to negative shocks. Groups concentrated in growing industries furnish their members with positive economic information and material resources, buttressing members' confidence in coethnics' ability to support their welfare. For migrants, this lessens the appeal of political incorporation. Amid industrial decline, however, the advantages of concentration dissipate, prompting migrants to politically integrate into the local community as a means of lessening reliance on their ethnic group. The ethnic topography of an economy the distribution of groups across industries — is an

important determinant of how group attachments evolve in contexts of economic prosperity and decay.

The historical evidence I present supports this argument. Varied ethnic concentration in coal cleaved both immigrant miners and coal-adjacent immigrants in periods of stable growth. Immigrants in groups more concentrated in local mines were substantially less likely to naturalize, confident in their economic position and group ties. Around mines buffeted by negative shocks, however, the negative relationship between group concentration and naturalization was diminished as immigrants looked beyond their coethnics for new sources of support. Whereas growth in the coal industry sustained immigrants' allegiances to their ethnic enclaves, decline corresponded to a transformation, though not a severing, of extant group ties. These trends were most evident among immigrants who were closely tied to their ethnic enclaves and who lived in areas where the material benefits of naturalization were attainable.

This argument should generalize to other industries. Historical accounts suggest that shocks to U.S. manufacturing in the early twentieth century, for example, prompted a similar fraying of ethnic ties among immigrant groups concentrated in the industry.⁹⁸ The findings should further generalize to other time periods and countries, particularly democracies marked by ethnic fragmentation and truncated welfare states. Such democracies are characteristic of much of the developing world today, which similarly often feature ethnic groups equipped with resource-sharing technologies.⁹⁹ The argument put forth here may also travel to pockets of developed democracies, such as immigrant communities in the contemporary U.S., which feature resource sharing among coethnics and often concentrate in specific industries.¹⁰⁰

⁹⁸ Cohen 2014.

⁹⁹ Holland 2018; Munshi 2014.

¹⁰⁰ Munshi 2003; Garcia 2005.

These findings point to several avenues for future research. Researchers, first, may investigate whether there is variation across immigrant groups in the extent to which these dynamics hold. They may be less apparent for wealthier immigrant groups that are less reliant on intra-ethnic resource-sharing. They may also break down for the ancestors of first-generation immigrants; subsequent generations may be less likely to rely on coethnics due to increasing assimilation and information on the relative fragility of ethnic resource-sharing arrangements, particularly in settings where formal welfare institutions are available.

Scholars might additionally consider how political elites respond strategically to the concentration of marginalized groups in certain industries. In periods of steady growth, politicians may neglect such groups as levels of political engagement remain low. However, politicians may actively seek to capitalize on the anxieties of groups concentrated in declining industries, promising them material benefits in exchange for their votes. A potentially fruitful avenue for future work may be to dissect how politicians decide upon the nature of such benefits. Do politicians opt for direct investments in an ethnic enclave, which might ignite nativist backlash, or instead seek subsidies to prop up an industry in which targeted groups are concentrated, which may not be identified as clearly by nativists as a transfer to ostracized groups? Researchers might also explore strategic behavior on the part of leaders within marginalized groups. Do leaders of groups concentrated in volatile industries seek to reinforce the cultural attachments of group members to dissuade exit amid industrial decline?

Another promising direction concerns gender identity and economic change, particularly in the context of male-dominated fossil fuel industries.¹⁰¹ Recent scholarship illustrates how economic shocks to women's families can transform patriarchal norms around political

¹⁰¹ See, e.g., Bush and Clayton 2021.

engagement.¹⁰² Scholars might probe whether, analogous to this paper’s argument, growth in fossil fuel industries historically accentuated the “gender gap” in rates of political participation in patriarchal settings. In periods of decline, as male relatives in the industry lose income and familial networks become increasingly stressed, women may increasingly look to exit traditional domestic structures and become more politically active.

Scholars might also investigate what these findings portend for the future politics of climate change, which are likely to be defined by transitions away from fossil fuel industries.¹⁰³ Outstanding questions include the extent to which these transitions will transform patterns of political contestation, and whether they will trigger identity-based backlashes like those attributed to economic globalization. Notably, fossil fuel industries remain connected to marginalized groups today. In India, for example, migrant communities have close ties to nearby coal mines; in the U.S., immigrants are well represented in oil and gas workforces.¹⁰⁴ This paper suggests that groups concentrated in these industries may increasingly look to integrate into local politics as the industries contract. By exploring how ethnic groups are distributed across industries, scholars may be able to shed light on how marginalized groups will cope with impending climate transitions and how such transitions will transform identity politics in the years ahead.

¹⁰² Gaikwad, Lin, and Zucker 2021.

¹⁰³ Colgan, Green, and Hale 2021.

¹⁰⁴ Das 2014; Paraskova 2019.

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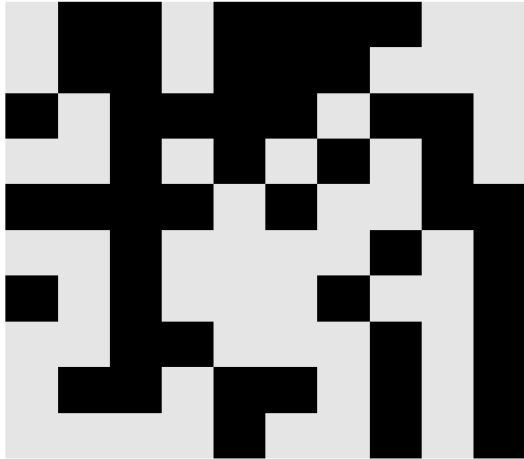
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GRAPHICS

Group A



Group B

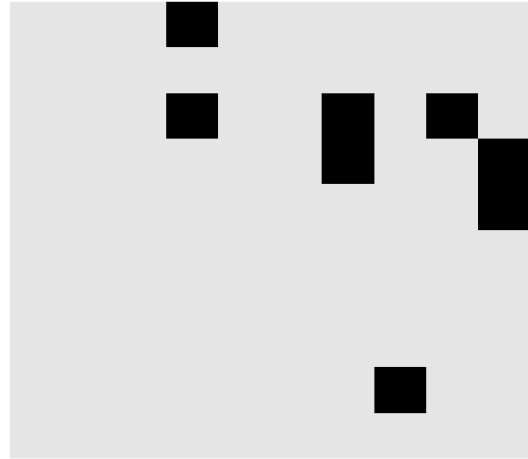
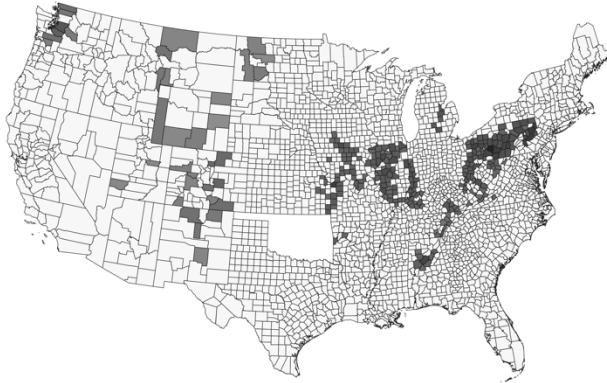
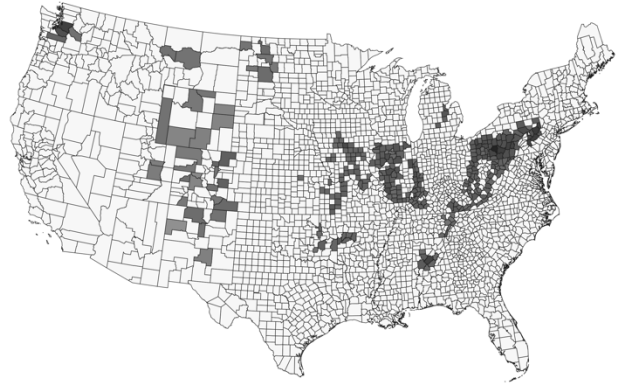


Figure 1

1900-10



1910-20



Matched European immigrants 0 10 100 1,000 10,000

Figure 2

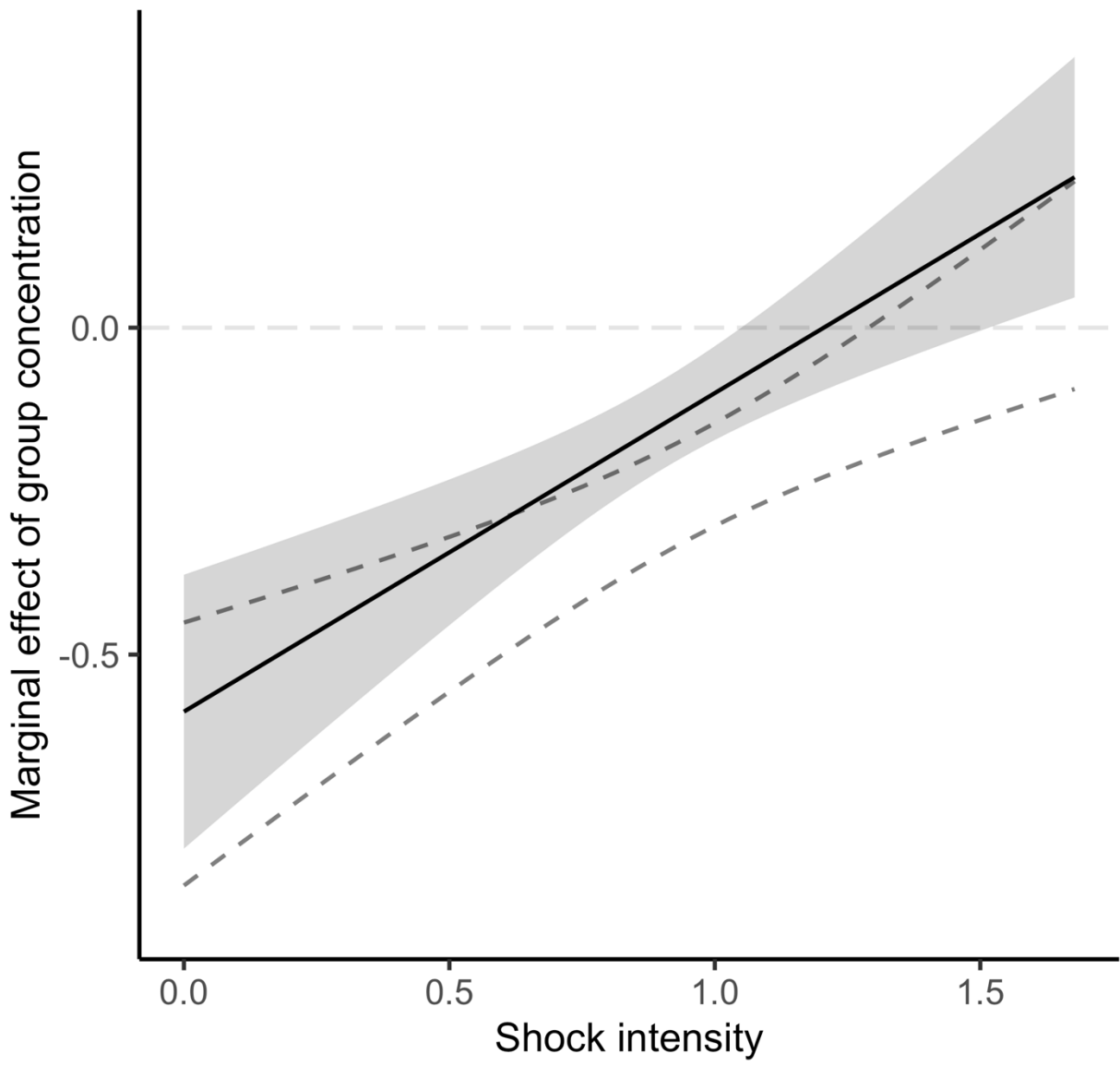


Figure 3 (graphical insert)

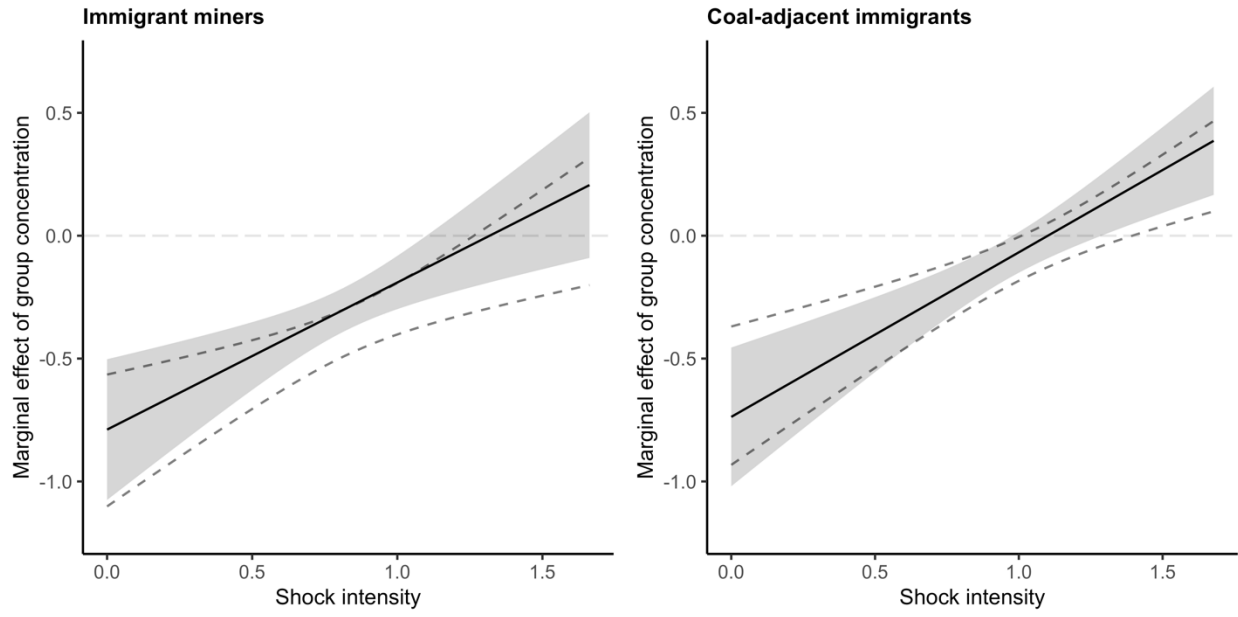


Figure 4 (graphical insert)

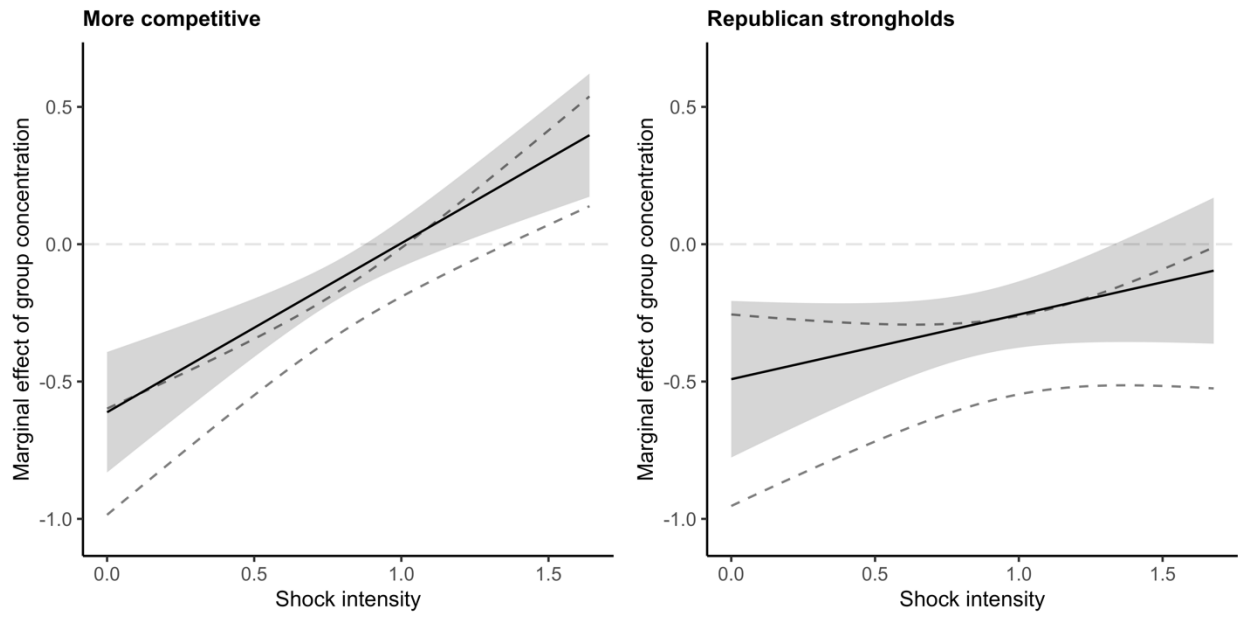


Figure 5

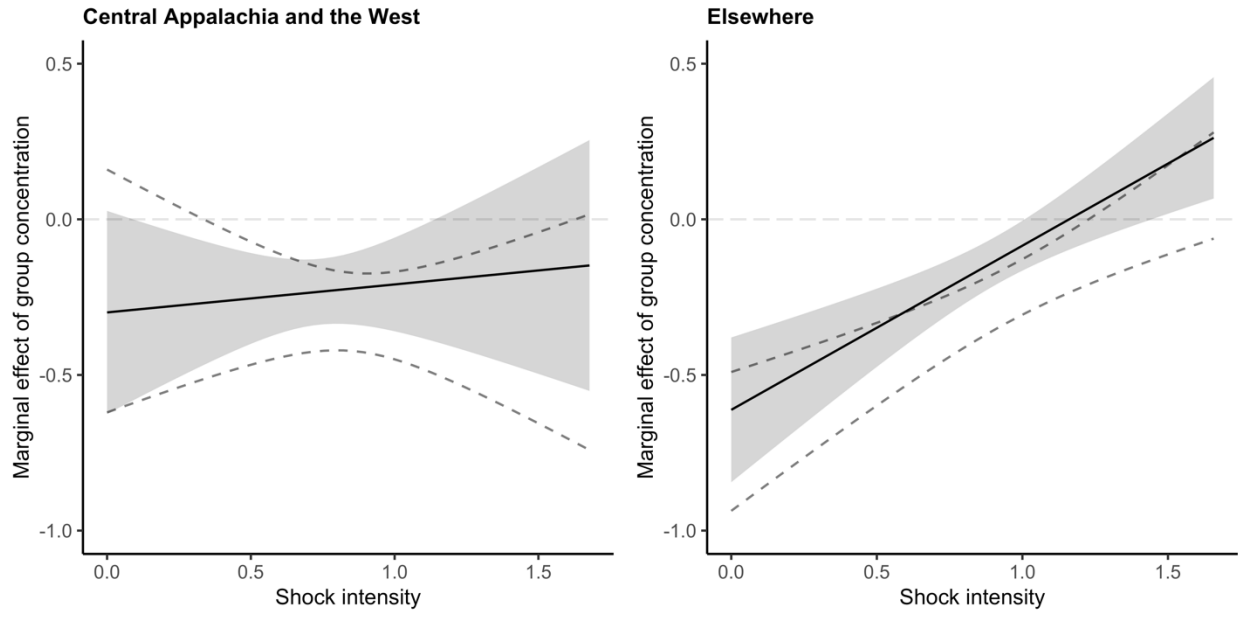


Figure 6

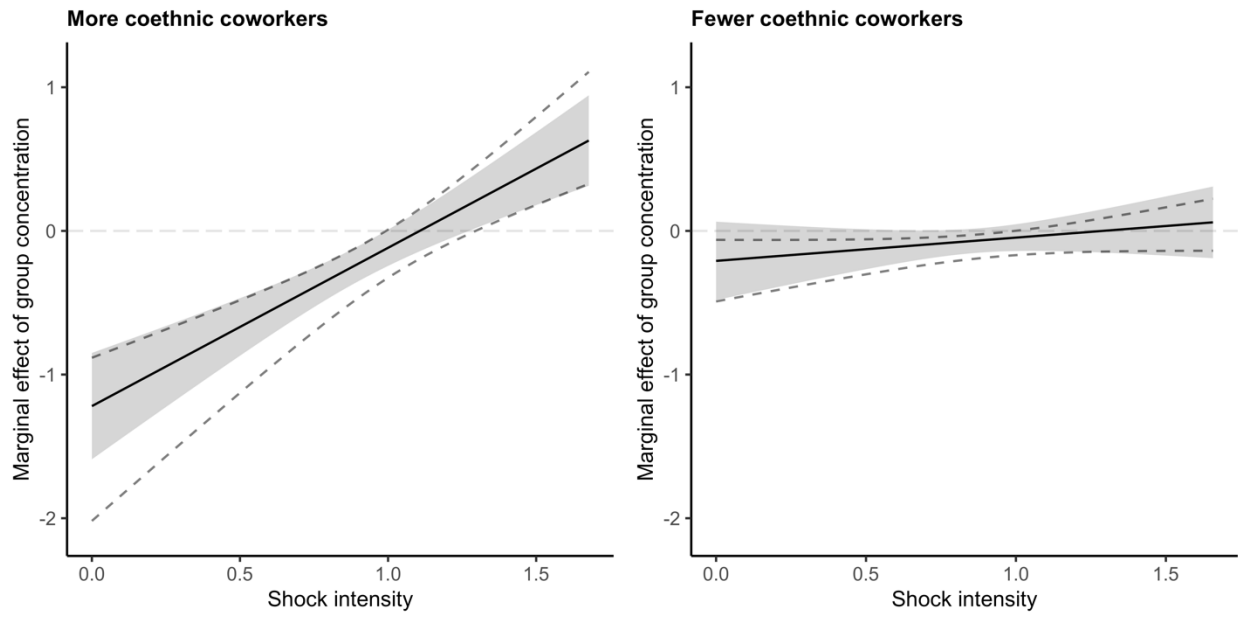


Figure 7