Structural Transformation and Value Change: The British Abolitionist Movement

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Abstract

What drives change in a society's values? From Marx to modernization theory, scholars have often highlighted a connection between structural transformation and value change, yet the links connecting the two processes are not always precisely identified. We argue that one of the ways through which changes in fundamentals lead to change in social values is by altering the distribution of economic power, and, by extension, the relative influence of values held by different groups in society. We study the case of the movement for the abolition of slavery in late 18th and early 19th century England, one of history's most well-known campaigns for social change, and an instance of massive shift in public opinion on a morally charged topic over only a few decades. Using geocoded data on anti-slavery petitions, MP voting behavior in Parliament and economic activity, we show that support for abolition was strongly connected to the rise of the industrial class. We rely on a large corpus of newspaper articles and the analysis of parliamentary speeches to provide evidence that the anti-abolitionist stance of the new elite was not motivated by economic interest in the narrowest sense, but rather that it formed part of a broader "universalist" worldview that was a distinguishing feature of industrialists.

Keywords: values, structural transformation, social change, slavery, abolition.

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1 Introduction

Moral values are not fixed, but vary both across societies and over time (Haidt, Koller and Dias 1993; Haidt 2012). Deeply entrenched customs and moral beliefs have sometimes changed quite rapidly (Appiah 2011). Footbinding, a practice prevalent in China for close to a millennium, became stigmatized and faded away in less than a hundred years (Mackie 1996). Laws and attitudes towards homosexuality shifted radically during the 19th and 20th centuries, and in some instances displayed discrete jumps; between 1990 and 2020, the proportion of Americans who approved of sexual relations between same-sex adults increased from 20% to 60% (Fernández, Parsa and Viarengo 2019).

Changes in a society's values are often triggered by changes in material conditions, such as the external environment (Bazzi, Fiszbein and Gebresilasse 2020), technological change (Fernández-Villaverde, Greenwood and Guner 2014), wars (Fernández, Fogli and Olivetti 2004) or epidemics (Fernández, Parsa and Viarengo 2019). Scholars have focused on how such shocks to "fundamentals" alter the payoffs for particular actions and shift associated beliefs and social norms. They have also emphasized channels of cultural transmission, whereby material changes shift the incentives of parents to socialize their children into particular moral values.

In this paper, we highlight a complementary mechanism that links value change to changes in material conditions. Economic transformation can trigger changes in the distribution of power within a society, reallocating status and influence across groups. If ascending social classes are characterized by distinct values and beliefs, their growing influence increases the prevalence of those values in society, elevating them into a new moral paradigm. Moral values of new elites can then spread in the population through various means, both institutionally through legislative changes and socially through prestige-biased transmission, as lower classes adopt the elite moral code.

We document this mechanism in the case of the movement for the abolition of slavery in late 18th and early 19th century Britain, one of history's most well-known campaigns for social change. The anti-slavery movement was initiated by Quaker activists, but quickly grew to find support among the broader British population, culminating with an estimated 20% of British men over 15 years of age signing pro-abolition petitions in 1833 (Drescher 1982). Temporally, the shift in perceptions of slavery from a fundamental institution of the British Empire to morally repugnant, coincided with the First Industrial Revolution and Britain's radical structural transformation from an agrarian to a capitalist economy. Historians have debated over the precise link connecting capitalism to abolitionism, emphasizing both economic (Williams 1944) and cultural factors (Ashworth et al. 1992). A prominent argument within the latter camp is that anti-slavery reflected the ideology and interests of the rising industrial elite, and that it helped legitimize a new capitalist order reliant on free labor (Davis 1975). While supportive of a mechanism of changing economic power and influence, this argument is challenged by scholars like Seymour Drescher, who claim that abolition was initiated by lower social strata and was rather a backlash against capitalism (Drescher 1986).

We bring systematic evidence to this debate by collecting and geocoding data on economic activity, anti-slavery petitions and MP voting behavior in Parliament. We first establish a strong connection between industrial activity and petitioning for abolition within Britain at the aggregate level. We conduct analyses at the parish level ($N = 13,816$) and construct two time-varying measures of industrialization following existing literature. The first one interacts subterranean coal deposits with a trend in coal consumption across England (Fernihough and O'Rourke 2014; Abramson and Esposito 2020; Fresh 2020); the second interacts the presence of 15th century water mills with an index of industrial output in England, building on the demonstrated connection between early use of hydraulic energy and the first stages of industrialization (Mokyr, Sarid and van der Beek 2022). Both these approaches allow us to keep fixed time-invariant unobservable characteristics of locations, and to estimate the change in petitioning activity resulting from a quasi-exogenous change in industrialization. The link between industrial activity and anti-slavery petitions is strong, and not driven by the time-varying effect of characteristics such as location and geography.

We corroborate these aggregate results using an IV strategy that relies on basic principles of hydraulics to predict locations of maximum hydropower in which an early water mill would likely have been built. This strategy uses the interaction of average river flow and elevation differential at a site to predict water power potential, *conditional* on a site's average flow and slope. Locations that combine high river flow with a sloped terrain – conditional on flow, distance to a river and other terrain and location characteristics – were more likely to have a water mill in the 15th century and to register higher petitioning activity against slavery as industrialization in Britain took off.

To provide more direct evidence that abolitionism reflected ideological change at the aggregate level we turn to text analysis. We scrape all articles mentioning slavery that were published between 1787 and 1833 from the British Newspaper Archive and link them to their place of publication. Structural topic modelling reveals a stark difference in the themes connected to slavery in industrial compared to non-industrial districts. Publications in industrial locations were more likely to feature articles presenting humanitarian arguments against slavery, emphasizing the natural right to freedom, as well as Christian values. Slavery was not more likely to be discussed in economic terms, and topics related to the slave trade were less common in industrial districts.

The aggregate connection between industrialization and petitioning for abolition could be the result of multiple factors, such as increased associational and political activity in urbanizing locations, and could be driven by middling social strata or the working class (Drescher 1986). Indeed, evidence from petitioning activity on issues other than slavery reveals that industrialization was connected to 'mass politics' (Tilly 2015), and broader agitation for political and social reform. Industrializing parishes filed more petitions on average, and were more likely to petition Parliament on parliamentary reform and on the extension of political rights to religious minorities. However, the effect of industrialization on petitions for abolition is generally larger than for other issues.

To better understand whether industrial elites played a distinct role, or whether aboli-

tionism was solely driven by lower social strata, we turn to the voting behavior of MPs. In 1833, Parliament debated the abolition of slavery and the conversion of enslaved persons to apprentices. We hand-coded a number of MP characteristics, including whether they had industrial interests or owned slaves in the West Indies. Industrial MPs were significantly more likely to display an anti-slavery stance in parliamentary divisions (roll-call votes) on abolition, supporting low compensation for slave owners and better apprenticeship conditions for freed slaves. This effect is not driven by MPs' party affiliation, religion, or by characteristics of their constituency, and points to ideological motives internal to industrialists.

We confirm the connection between industrial interests and anti-slavery activity beyond the narrow sample of MPs. We exploit the fact that one of the few surviving anti-slavery petitions, which was produced in 1806 in the industrial city of Manchester, lists the names of signatories. A subset of these names were linked to trade directories by the Manchester and Lancashire Family History Society, allowing us to identify the occupations of these individuals. Because of the way in which signatures were collected, which did not rely on door-to-door canvassing, we can use the order of signatures as a proxy of an individual's centrality in the abolitionist movement (Makovi 2019). Manufacturers are the largest group of signatories, and they sign the petition earlier than individuals of other occupations, including other elite occupations such as merchants or attorneys.

To probe whether industrialists' leading role in the abolitionist movement was driven by ideology or self-interest, we return to the sample of MPs and examine whether their voting behavior was driven by their overall opposition to the mercantilist system that supported the colonial economy or their own dependence on colonial raw material. We find no evidence that positions on free trade or involvement in textile manufacturing affected industrialist MPs' abolitionist stance. Anti-slavery positions of MPs were not influenced by support for abolition in their constituency and do not appear to be have been used as means to attract voters. While anti-slavery votes of MPs were responsive to labor unrest, lending some support to the argument that the popular cause of abolition was used as a way to deflect domestic grievances, such strategic motives were equally important for MPs with industrial interests and others.

Finally, we apply text analysis to the speeches of MPs in Parliament, and find that industrialists were using distinct moral language. We rely on Moral Foundations Theory (Haidt 2007; 2012) and the Moral Foundations Dictionary[1] to identify terms associated with "universalist" and "communal" morality. The former is defined by an emphasis on non-harm and fairness as guiding moral principles, while the latter prioritizes ingroup loyalty and respect to traditional authority. MPs with industrial interests were more likely to employ universalist moral terms; interestingly, political orientation has no predictive power for universalist language. Importantly, industrialists were more universalist in their broader discourse, and not only in their speeches on the topic of slavery. This supports a mechanism of industrialists

[1] https://moralfoundations.org/other-materials/

as distinct value "types", whose rise in power triggered a shift in the relative importance of universalist values in society.

Our paper demonstrates that material change engenders value change. It contributes specifically to a large literature in the social sciences, which connects to both Marx ([1859] 1970) and modernization theory (Inglehart 1997; Inglehart and Welzel 2005), and links structural transformation to social and cultural change. We add to this literature by bringing systematic quantitative evidence on the connection between economic fundamentals and value change in a prominent historical case, and by providing evidence for a mechanism of changing distribution of economic power within society as a driver of changing values.

Emphasis on the latter mechanism makes our study complementary to work examining how economic change leads to political transformation through elite turnover. Changes in the distribution of economic power do not need to reflect in changes in de facto political power (Acemoglu and Robinson 2006*a*) and the persistence of entrenched elites, even in the face of change, is well documented (Dal Bó, Dal Bó and Snyder 2009; Querubin 2012; Clark and Cummins 2014). Yet, specifically in the case of Britain, Fresh (2020) demonstrates that industrialization reduced dynastic persistence and increased the political power of industralist MPs. We show that this same development brought about changes in ideology and values, which themselves had important ramifications on Britain's economy and institutions.

A small number of recent studies have empirically examined the relationship between slavery and economic structure. Heblich, Redding and Voth (2022) show that slaveholding in Britain led to increased wealth and a move from agricultural to industrial production as early as 1792. Consistent with our findings, their study provides no evidence of an economic incentive to abolish slavery among the industrial class who, if anything, profited in their rise from slavery wealth. Masera and Rosenberg (2021) demonstrate the role of economic incentives in the decline of pro-slavery political attitudes in the US Antebellum South. In that context, the drop in the profitability of cotton led to the demise of planter elites and the clientelistic relationships they maintained with the non-planter white population. In the UK context, cultural and institutional change ensued from the rise in a new elite characterized by different ideology and values, rather the economic decline of the old one, though the outcome, in relative terms, was the same.

Our paper contributes to empirical work on cultural change. In this literature, emphasis has been placed on changed incentives for adopting particular values or beliefs, triggered by changes in external conditions (Nunn and Wantchekon 2011; Voigtländer and Voth 2012; Acharya, Blackwell and Sen 2016).[2] A related strand of literature has focused on socialization incentives of altruistic parents, who respond to changes in the environment by changing the values they instill to their children (Tabellini 2008; Doepke and Zilibotti 2008; Fernández-

[2]A much broader literature in economics has empirically linked values, as well as other elements of culture, such as beliefs and social norms, to material conditions. See for instance Alesina, Giuliano and Nunn (2013); Galor and Özak (2016); Fouka and Schläpfer (2020); Buggle and Durante (2021).

Villaverde, Greenwood and Guner 2014). Our study highlights a complementary mechanism through which material change drives value change, that of a changing distribution of power across "value types", that works to increase the influence of particular ideological profiles in a society. Our focus on economic elites as leaders of the abolitionist movement complements previous work on anti-slavery leadership (Dippel and Heblich 2021). Elite values can be adopted by lower social strata through status-based transmission and transmitted from parents to children, making this mechanism compatible with models of socialization (Bisin and Verdier 2001).

Our analysis suggests that the ideological types of industrialist elites correspond closely to a universalist morality, as defined by the Moral Foundations Theory (Haidt 2007; 2012). Our paper thus connects to a literature that has examined differences in moral foundations between liberals and conservatives (Graham, Haidt and Nosek 2009; Enke 2020), as well as studies on the concept of moral universalism, which captures the extent to which altruism extends beyond a narrow in-group (Enke, Rodríguez-Padilla and Zimmermann 2020; Enke, Rodriguez-Padilla and Zimmermann 2021; Alexander, Enke and Tungodden 2023). Our results suggest that the universalist-communal divide in values may have been present at the elite level, since at least the Industrial Revolution. Though our data does not allow us to provide direct empirical confirmation, our findings are compatible with the assumption made in Enke, Polborn and Wu (2022) that moral values are a luxury good. Industrialists characterized by a universalist morality may have been both more able and more willing to act on their moral values as their income and social status grew.

Finally, and most broadly, our paper adds to a literature in historical political economy that studies the great economic and political transformations that occurred in Europe in the 18th and 19th centuries. This literature has linked economic modernization to the rise of representative democracy (e.g., Boix and Stokes 2003), the broader circulation of newspapers to the development of party-centered government (e.g., Cox 2005), and urbanization to the decline of vote-buying and the establishment of the secret ballot (e.g., Aidt and Jensen 2016). In the case of 19th century Britain, the major political transformation was the Great Reform Act of 1832, and its causes continue to be debated (e.g., Acemoglu and Robinson 2006; Aidt and Frank 2015; Cox, Fresh and Saiegh 2020). We complement this largely political and institutional literature by focusing on an episode of radical cultural change – a phenomenon that has seldom been studied quantitatively.

2 Historical background

2.1 British slavery and the abolitionist movement

In the early nineteenth century, the Atlantic slave trade was a profitable business (see, e.g., Drescher 1977, cf. Williams 1944). In the period 1801-10, the yearly volume of the trade amounted to over 60 thousand enslaved persons per annum (Drescher 1986, p. 6). Britain was the dominant player in this market – more than half of enslaved persons transported against their will between 1791 and 1805 were carried by British ships. Slave labor was

the main input for the production of sugar in the West Indies, and British colonies in this region (such as Jamaica and Trinidad) produced more than half of the world's sugar in 1805 (Drescher 1977, p. 15-37).

The initial effort to put abolition on the parliamentary agenda in Britain came from the Quakers in 1783 and was grounded on religious principles, but was quickly dimissed. What historians have termed the "abolitionist movement" began a few years later, in 1787-8, with the foundation of the Society for Effecting the Abolition of the African Slave Trade and ended in 1833-8 with the abolition of slavery and the end of the apprenticeship system in the British Caribbean (Drescher 1986, p. 3).

Table 1. Timeline of abolitionist movement

1774	Quakers expel members engaged in slave trade
1783	Quakers petition Parliament against slave trade.
1787	An anti-slavery society is formed in London.
	Petition campaign in Manchester.
1792	Second abolitionist campaign.
1806	Resurgence of abolition societies.
1807	Abolition of slave trade.
1823	Anti-Slavery Committee formed in London.
	Mass petition campaign is launched.
1831	Petition campaign for immediate emancipation of the enslaved.
1833	Mass petition campaign for emancipation.
	Parliament passes the Emancipation Act.
	Slave owners in the West Indies are compensated £20 million.
1838	The apprenticeship system is abolished.

A key strategy of the abolitionists was the use of campaigns that produced bursts of petitions flowing to Parliament (Jones 1999; Huzzey 2019). These were mass campaigns. The 1788 petition from Manchester had 11,000 signatures, representing a fifth of the town's population (Makovi 2019, p. 628). Popular campaigns for abolition can be grouped in three broad stages: episodic campaigns for the abolition of the slave trade between 1788 and 1814, campaigns for improving the living conditions of enslaved persons in 1823, and mass national campaigns for the emancipation of the enslaved in 1830-3 (Drescher 1986, p. 58). From 1778 to 1833, Parliament received at least 12,124 petitions (documented in the Journals of the House of Commons, 1778-1833). In 1814 and again in 1833, 20 percent of the British adult population signed one of these petitions (Drescher 1986, p. 92).

Changes in policy largely mirrored the changes in popular mobilization. The timeline of events is summarized in Table 1. The slave trade (but not slavery itself) was abolished in 1807. In 1833, Parliament made all enslaved persons in its West Indies colonies paid apprentices, and then finally freed them immediately in 1838.

Abolition was costly to Britain. The apprenticeship bill of 1833 compensated slave owners for £20 million, an amount which represented 5% of British GDP and was only fully paid off in 2015. Kaufman and Pape (1999, p. 636-640) estimate the overall economic cost of anti-slavery efforts to British society at approximately 1.78 percent of national income per

year from 1808 to 1867. Besides the compensation to planters, this estimate includes the naval, legal, and diplomatic costs of suppressing the slave trade, lost customs revenue, lost income from the slave trade, reduced exports to West Africa and the British West Indies, the lost sugar-carrying trade, and higher sugar prices for British consumers of an average of approximately £5 million per year from 1835 to 1846. On top of the economic costs were the national security costs of losing profitable business to the Americans and French, and the loss of life, mainly from disease, of members of the Royal Navy in charge of enforcing the ban on the slave trade (Kaufman and Pope 1999, p. 634-635).

2.2 The Industrial Revolution and structural change

In tandem with popular mobilization, Britain was experiencing rapid economic change. The Industrial Revolution that began in England circa 1750 radically transformed a wide range of economic sectors, including textile production, metallurgy, and transportation. As a consequence, England rapidly transitioned from being an agricultural nation into an industrial and capitalist economy. Rural-to-urban migration, the rise of industrial labor, and better standards of living ensued (Clark 2008; Allen 2000).

In less than a century, from 1780 to 1870, Britain's real gross domestic product per capita doubled, putting it 70 percent ahead of its continental neighbors in France and Germany. Simultaneously, the proportion of the labor force employed in agriculture halved to 22.7 percent while around a third of the population was employed in manufacturing (Crafts 1998, p. 195). Britain became the "workshop of the world" (Crafts 1998, p. 193). The population of the new industrial cities specializing in cotton, Manchester, Birmingham, and Sheffield, grew more than ten-fold between 1750 and 1850 (Brezis and Krugman 1997).

Industrial activity was geographically concentrated (Crafts and Wolf 2014), and this altered the economic and social geography of England. By the Victorian era, England had two distinct middle classes: a relatively wealthier and capital-intensive one based on commerce in London, and a labor-intensive one based on manufacturing in the North (Rubinstein 1977).

The new industrialists had distinctly middle class origins. This is well-documented in Doepke and Zilibotti (2008) who cite the conclusion of Crouzet (1985) that "neither the upper class nor the lower orders made a large contribution to the recruitment of industrialists" (Crouzet 1985, p. 68). Crouzet's analysis of the social origins of a sample of major industrialists between 1750 and 1850 shows that 85% of them had a middle-class background, with almost half of them coming from low-middle-class families, such as "shopkeepers, self-employed craftsmen and artisans, cultivators of various kinds" (Crouzet 1985, p. 127). These rising middle classes were also characterized by distinct preferences. Doepke and Zilibotti (2008) have emphasized their strict work ethic and disdain for leisure, with roots in their earlier occupations and long periods of apprenticeship during which they developed their skills. Those same values derived not only from their occupational origins, but also from their religious beliefs. Early industrialists were often to be found among religious dissenters, who embraced both a Protestant work ethic as well as enlightened ideas about human liberty and freedom from oppression. Examples include pottery maker Josiah Wedgwood and ironmaster

Richard Reynolds, both prominent abolitionists.[3]

As a result of their economic success, the social and political influence of industrialists was important at the regional level: "coal and iron masters in South Wales, mill owners in Yorkshire and Lancashire, engineers and shipbuilders in Liverpool and Scotland. By the early Victorian period these men of business and industry had founded dynasties" (Harrison 1979 cited in Nenadic 1991, p. 66). Industrialists also occupied a crucial position in society because they were arbiters of social relationships with the industrial workforce —an increasingly large portion of the working population. "In the eyes of the middle class, manufacturers possessed moral authority" (Nenadic 1991, p. 80).

2.3 Capitalism and abolition

In view of the significance of the changes brought about by the rise of industrial capitalism, it is unsurprising that historians have put forth a wide variety of economic explanations for the success of the abolitionist movement (e.g., Williams 1944, Davis 1966, Haskell 1985, Drescher 1986). The traditional view of the abolition of slavery in England neglected economic change entirely. It was mostly the history of the leaders of the abolitionist movement, like William Wilberforce and Thomas Clarkson, their humanitarian ideals, and their ability to persuade the public. Economic explanations for abolition stand in contrast to these traditional "great men theories."

The first work to challenge the traditional view was Eric Williams's *Capitalism and Slavery* (1944). Williams argued that the Atlantic slave trade was fundamental for the initial stages of England's capitalist development, and that indeed industrialization hinged on the capital accumulated from the slave trade, but over time slavery became economically unprofitable for England. As a result of the declining importance of the West Indies as a trading partner, slave owners gradually lost economic power and support from the English bourgeoisie. The bourgeois became increasingly hostile to colonial monopolies and embraced laissez-faire.

Later research, and most notably Seymour Drescher's *Econocide* (1977), debunked the notion that slavery had become unprofitable by the early nineteenth century, and instead established that slavery was a booming business.[4] Britain abolished slavery against its economic interests. Why this happened is a matter of debate, with two competing theories emerging as candidate explanations.

The first theory features the bourgeoisie as its central actor (Davis 1966). Capitalism transformed social relations between employers and workers, and with it the moral order of societies. The concept of free labor was central to capitalist relations and slavery was the

[3]It is telling that scholars like Mokyr, who have emphasized the role of culture and ideas for industrial Britain's growth miracle, attribute those industrialists' anti-slavery positions entirely to their enlightened ideas and not to economic interest (Mokyr 2016, p.277).

[4]Other aspects of Williams's argument are also disputed. Eltis and Engerman (2000) have argued that colonial slavery, though profitable, was not central to Britain's early industrialization.

antithesis to this rising economic order. Therefore, the new industrial classes publicly opposed slavery as part of an ideological crusade. This crusade was not motivated by narrow concerns of profitability; though aligned with the economic interest of rising elites, Davis's argument holds that anti-slavery is better understood as part of a broader worldview, reflecting a new economic, social and moral paradigm.

Rather than seeing anti-slavery as a way of justifying capitalist social relations, the second theory argues that it was instead a form of resistance (Drescher 1986). According to this account, anti-slavery was not propelled by the bourgeois, but by the very actors threatened by the new capitalist labor relations – such as artisans and miners. These workers' moral values were offended by slavery, and they associated the conditions under slavery with their own dispossession in the factory system. "Abolition was not charity at a distance but a preemptive strike against the aristocracy at home" (Drescher 1986, p. 143). Because these workers and artisans were formally excluded from the political system, they channeled their demands via extra-institutional means, like public petitions to Parliament.

Both historical arguments see abolitionism as a result of changing labor relations and social influence brought about by industrialization, but emphasize different mechanisms.[5] Before bringing quantitative data to bear on this debate, we turn to broader social scientific theories on the connection between structural transformation and value change. Not inconsistent with the view of Davis (1966), we argue that a changing distribution of economic power in society can change the relative influence of different value systems.

3 Conceptual framework

The idea that moral values reflect a society's "fundamentals" – in the sense of external material constraints such as the environment or the main mode of subsistence – has a long history in the social sciences. For Marx, values form part of the social superstructure, which includes not only culture, but also institutions and forms of political organization, all deriving from a material base consisting of the means of production and relations over those means. This materialist line of thought has been extremely influential among scholars of culture both within and outside the Marxian tradition (Gramsci 1992; Althusser 2014; Nisbett 2004; Alesina, Giuliano and Nunn 2013; Talhelm et al. 2014). Clearly, a unidirectional relationship is simplistic, as values often exert great influence on economic and social trajectories (Weber [1905] 1958), and culture and structural conditions are generally thought to influence each other in feedback loops, or equilibria (Greif 1994; Bisin and Verdier 2017; Acemoglu and Robinson 2021). Yet

[5] Intermediate accounts also exist. Some scholars acknowledge that the leaders of the abolitionist movement were middle class industrialists and religious dissenters, but see the role of industrialization as helping those leaders' ideas spread to the rest of the population and foment a mass movement. For instance, Quirk and Richardson (2010) highlight the role of rapid urbanization in permitting the creation of networks and organizations that could spread new ideas fast. Other theories have also been articulated on the connection of capitalism and abolition, for instance a link between exposure to market activity and internalization of the welfare of distant others (Haskell 1985).

value change as a result of structural change is a common theme in the study of culture.

Perhaps most prominent among the theories connecting value change to structural transformation is modernization theory (Lerner 1958; Lipset 1959). Modernization refers to a host of material changes experienced by societies as they transition from agricultural to industrial production, which include economic growth, urbanization, exposure to mass media and the diffusion of education to large segments of the population. These deep structural changes have been thought to reflect in changing values, described variously as post-materialist (Inglehart 1977; 1990), liberal (Inglehart and Flanagan 1987) or human-centric (Bürklin, Klein and Russ 1996). Broadly, such values are oriented towards more respect of fundamental human rights, as well as a greater emphasis on civil liberties, individual freedom and self-determination.

But how does structural change lead to value change? Modernization scholars have mainly focused on post-WWII Western democracies and emphasized the role of wealth in shifting the importance placed on non-material goals (Inglehart 1977).[6] More broadly, work in economics has formalized and empirically tested the notion that material changes affecting a society shift payoffs to particular actions, thus altering behavioral patterns and with them associated social norms. This reasoning applies not only to economic change, but also to other types of "shocks" that can change incentives to adopt different strategies. For example, Nunn and Wantchekon (2011) show that the transatlantic slave trade introduced a culture of mistrust in Africa, and Fernández, Parsa and Viarengo (2019) demonstrate how the AIDS pandemic changed the incentives to "come out" leading to a shift in attitudes around homosexuality.

Here, we highlight a complementary mechanism linking structural transformation to value change, which goes beyond individual incentives to adopt different values in response to changes in the environment. Fundamental changes in a society's production structure lead to a changed distribution of economic power within the population. With structural transformation comes social transformation; groups that dominate the new mode of production exert increasing influence across all social domains. The moral values and ideological positions of rising elites can then come to dominate society and be imposed on the rest of the population either through institutionalized means – for instance through legislation that effects institutional changes – or through social processes of conformity and status-based transmission. Value change can then be viewed as induced by the distribution of economic power and social influence across "types" in the population – distinguished by their moral values or ideologies – rather than caused by change in individuals' values as they face a different set of material conditions and external constraints, though these two channels could be complementary and occur simultaneously.

The extent to which economic transformation will lead to value change through the proposed mechanism may vary across societies. When entrenched elites manage to use existing institutions to block socioeconomic mobility or limit the influence of rising social strata, the

[6]See Enke, Rodriguez-Padilla and Zimmermann (2021) for a political economy model formalizing moral values as a luxury good.

distribution of de facto power in a society does not change, and dominant values may also remain the same (Acemoglu and Robinson 2006*a*). Yet when transformation is radical enough, or when institutions allow for some degree of mobility, change in fundamentals should reflect in value change through a shifting distribution of political and social influence. In the case of industrializing England, Fresh (2020) shows that structural change led to increased political turnover, disrupting existing political dynasties and elevating the industrial class to the status of a new political elite. We hypothesize that the same process led to the values and ideas of the new elite taking hold among the population.

There are multiple pathways through which the values of a new economic and political elite become the new cultural paradigm. One channel is highlighted in the cultural framework of Acemoglu and Robinson (2021). Like other work in the materialist tradition, Acemoglu and Robinson (2021) see shocks to fundamentals as giving rise to critical junctures at which social change is possible. Yet the direction and shape of change is crucially shaped by "cultural entrepreneurs", who compete for influence over the larger society.[7] Political power can tilt the balance in favor of specific ideological paradigms or bundles of values. A concrete way in which this can be achieved is by a change in institutions, which can then serve to perpetuate the ideological and moral narrative of the elite that established them. In the case of slavery, abolition was the institutional change that condemned the old state of affairs as immoral and unjust.

Another mechanism for value diffusion is social in nature. Elites, or individuals of high social status, are imitated at a higher frequency, and exert a disproportionate influence on societal norms. The process of prestige-based transmission plays a big role in evolutionary models of culture (Boyd and Richerson 1985; Chudek et al. 2012) and status has been identified as a crucial driver in many well-known instances of rapid social change (Mackie 1996; Appiah 2011).[8]

The mechanism we highlight is consistent with the theory of Davis (1966), who viewed anti-slavery as part of the ideology of the industrial class, that helped legitimize the foundation of the new economic order in which this class was at the top of the social hierarchy. Davis also emphasized the role of status-based transmission. Elite ideology was adopted by the broader population through a process of "ideological hegemony".[9] Social strata with prospects of

[7] This is similar to the concept of "political entrepreneurs" used by Tilly to describe figures who were able to mobilize the population for political causes during Britain's period of "mass politics," the same time period in which the abolitionist movement took off (Tilly, 1995, p.147). Urbanizing, industrializing Britain was a favorable environment for such entrepreneurs to sway large segments of the population.

[8] The diffusion of elite values is also consistent with models of interegenerational transmission and endogenous preference formation, in which partly or fully altruistic parents instill adaptive values that can help their offspring perform well in a given environment (Bisin and Verdier 2001; Tabellini 2008). Compliance with the values of influential elites may be in the best interest of children growing up in a world in which economic and social power is shifting.

[9] This notion has its roots in Gramsci. Tilly (2015) refers to the related concept of "imposed consciousness" as one of the means to explain popular mobilization for various political causes in Britain during the early 19th century.

upward mobility, like skilled craftsmen and artisans, became abolitionists in an attempt to find their place in a rapidly changing world (Davis in Ashworth et al. (1992)). Ideological hegemony may have also been achieved through means other than imitation. Quirk and Richardson (2010) suggest that we should not "ignore the influence of non-conformist captains of emergent British industries to promote among their employees values consistent with both anti-slavery and improving industrial productivity. Such values included church attendance, sobriety and temperance, time discipline, and personal responsibility (Thompson, 1968: 385–98)."

In what follows, we provide evidence consistent with the above hypothesis. We show that the abolitionist movement spread in industrializing areas, that industrial elites spearheaded the movement and that their abolitionist stance was reflective of a broader ideology or set of values that distinguished them from non-industrial elites.

4 Data

We combine several original data sources to establish an association between industrialization and abolition and examine the mechanisms linking the two, with an emphasis on the leadership role and ideology of industrial elites. We conduct two main sets of analyses: one at the level of a parish or census registration district (CRD) and one at the level of the individual member of Parliament (MP). Table A.1 in the Appendix lists descriptions and sources for all variables used in our analysis. Tables A.2 and A.3 provide summary statistics.

4.1 Measuring support for abolition

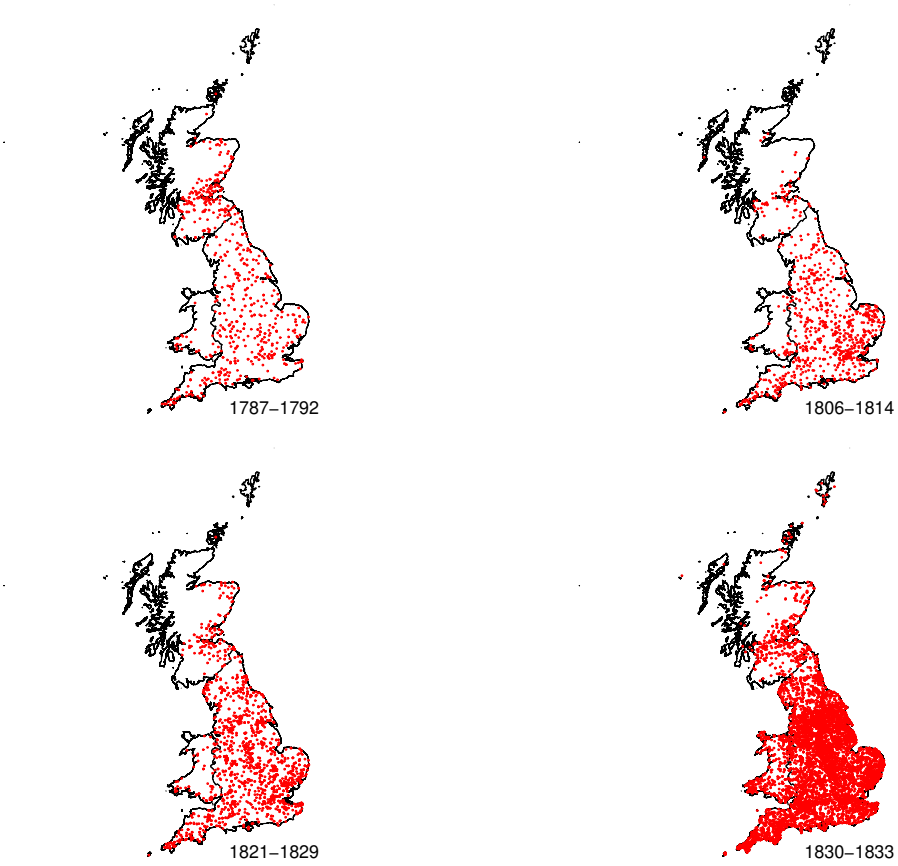
Petitions for abolition. To measure support for abolition at the aggregate level, we rely on petitions submitted to Parliament. Information on the topic, date, and town of origin of all petitions submitted between 1788 and 1833 is available in the indices of various editions of the *Journal of the House of Commons*. We geocoded the towns of origin of all petitions for the abolition of slavery, as well as petitions on two other salient issues of the period, Parliamentary reform and Catholic rights. We use the petitioning town's geographic coordinates to assign each petition to one of approximately 13,000 parishes in England and Wales. Our analysis examines a total of 12,124 anti-slavery petitions during years in which petitioning campaigns took place (1788, 1792, 1814, and 1823-1833).

Figure 1 displays the spatial and temporal evolution of anti-slavery petitions sent to Parliament during different stages of the abolitionist movement.[10] The abolitionist cause had few adherents in 1787, but became extremely popular at the national level by 1833. Figure B.1 in the Appendix plots the cumulative number of petitions filed at the national level, showing that the sharp increase in the support for the abolitionist cause took place after 1823, and in particular in the period 1830-1833. The petitions were sent by the inhabitants of towns and

[10] Petitions filed before 1807 called for the abolition of the slave trade. All petitions filed after that year called for gradual or complete abolition of slavery.

parishes, but in 1830-1833 most petitions were sent by congregations of Protestant dissenters (Drescher 1986, p. 127).

Figure 1. Spatial distribution of anti-slavery petitions over time



Newspaper articles on slavery. As an additional aggregate measure of locations' support for abolition, we use newspaper articles. This measure allows us to study the content of discussions surrounding slavery in industrial and non-industrial locations. We scrape all articles containing the words "slave" or "slavery" from the British Newspaper Archive (BNA) and construct a corpus of 12,421 articles published between 1787 and 1833. These articles were published in 121 different newspapers of diverse political leanings.[11] Figure B.1 in the Appendix plots the total number of articles on slavery over time and shows that news interest on the topic closely tracks the growth in petitioning activity. To examine differences in content between industrial and non-industrial districts, we rely on the location of newspapers listed on BNA. Because a newspaper likely reached audiences in multiple parishes, we conduct this analysis at the level of the CRD ($N = 624$).

[11] We were able to identify the political orientation of 73 newspapers, out of which 30 were conservative and 43 were liberal, socialist, or radical.

Voting behavior of MPs. Because petitioning activity could be driven by both the elites and the lower classes in industrial areas, we use individual-level data to more directly connect industrial interests to support for abolition. We start from a list of MPs in 1832, based on data from Eggers and Spirling (2014) and code an MP as being opposed to slavery in the colonies if he voted for limiting the period of apprenticeship and for minimal compensation to planters in at least one of the parliamentary divisions (roll-call votes) on the Slavery Abolition Act of 1833. For this, we used information from parliamentary debates.[12] Our approach to measuring anti-slavery positions follows Gross (1980) and Franzmann (1994).

Signatories of the 1806 Manchester petition. A fire in 1834 destroyed most of the palace of Westminster and with it many parliamentary records, including petitions to the House of Commons. One of the few surviving documents is an anti-slavery petition filed in 1806 by the town of Manchester, with a total of 2,348 signatures. We use the transcript of the petition produced by the Manchester and Lancashire Family History Society (MLFFS). MLFS has matched petitioners to trade directories, providing information on their occupations. Because signatures on petitions in Britain were not collected through door-to-door canvassing, but after public display of petitions in various locations across a town, we follow Makovi (2019) and use the order in which petitioners signed as a measure of the centrality of their role in the movement.

Parliamentary speeches. To more precisely characterize the ideology and values of MPs, we analyze the content of parliamentary speeches. We examine speeches delivered in 1833-34, available from Eggers and Spirling (2014). Out of 6,887 speeches, 333 were delivered by industrialist MPs. Eggers and Spirling (2014) have coded titles for each Parliamentary debate, allowing us to identify debates on slavery, by tagging those that include the token "slave."

4.2 Measuring industrial activity and industrial interests

Industrial activity. Our analysis focuses on the period 1787-1833, during which a time-varying measure of industrialization at the local level is not available. We overcome this challenge using as proxies of industrial growth two variables generally thought to have influenced the location and development of industry during the Industrial Revolution.

The first one is the availability of coal. Coal was a major driver of industrialization in England (Pomeranz 2021) and its location, at least during the earlier stages of the Industrial Revolution, was a constraint to the spatial allocation of industrial activity. As Crafts and Wolf (2014) argue: "if there was a necessary condition for having a cotton textiles mill in 1838, a cheap source of power is the nearest candidate" (p. 1131). We construct a time-varying proxy of industrialization by interacting a measure of local coal supply with the trend in the importance of coal as a source of energy at the national level (Fernihough and O'Rourke 2014; Abramson and Esposito 2020; Fresh 2020). We use data on coal-bearing bedrock from the

[12] Available online at http://hansard.millbanksystems.com

British Geological Survey and measure the availability of coal at the CRD or parish level as the area of the spatial unit that overlaps with coal-bearing bedrock or the distance from a unit's centroid to the nearest coal deposit. We then interact this measure of coal supply with the total coal consumption in England from Warde (2007).

Mokyr, Sarid and van der Beek (2022) have demonstrated that industrialization crucially relied on upper tail human capital and mechanical abilities, emphasizing the role of millwrights in determining the location of industry during the Industrial Revolution. Relatedly, Kelly, Mokyr and Ó Gráda (forthcoming) have pointed out that the mechanization of the textile industry relied primarily on hydraulic energy and that water power still made up 70% of industrial power by 1800. Given the prominence of water power for early industrial development, we construct an alternative measure of industrialization relying on the location of water mills between 1399-1477 from the Inquisitions post Mortem, compiled by Heldring, Robinson and Vollmer (2021). We interact the logarithm of the number of water mills with an index of industrial production in England from Crafts and Harley (1992).[13]

Figure B.2 in the Appendix depicts the location of coal-bearing bedrock and fifteenth century water mills in England and Wales. We verify the validity of these measures as proxies of industrial activity in Table B.1. The presence of both coal and water mills strongly predicts the share of all male workers employed in manufacturing in 1831 conditional on the entire set of controls used in our baseline analysis (described in Section 4.3).

Industrial interests of MPs. We compile data on the individual characteristics of MPs from Stenton's (1976) *Who's who of British members of Parliament.* We use this biographical dictionary to code an indicator for MPs that had industrial interests (i.e., were manufacturers). In total, 25 out of 558 elected MPs were so coded. We also code indicators on the MP's political leaning (conservative, liberal or radical).[14] To measure an MP's economic stakes in the institution of slavery, we use data from the *Centre for the Study of the Legacies of British Slavery.* This project, led by researchers at University College London, has compiled an Encyclopaedia of British Slave-ownership which contains information on all slave owners in the British Caribbean, Mauritius or the Cape at the moment of abolition in 1833, as well as all slave-owners, attorneys, mortgagees and legatees linked to estates in the British Caribbean in the period 1763-1833. We code as 'slave owner' any individual listed in this database.[15] As shown by Heldring, Robinson and Vollmer (2021), landed gentry played an important role in the Industrial Revolution, among other ways as investors in industrial projects. We

[13] According to **?** (2009, p.173), coal overtook water as the most important stationary power source in Great Britain after 1830. Between 1760 and 1830, the period in which our analysis is centered, the importance of water doubled, but that of coal grew by a factor of 32.

[14] As modern political parties did not exist in this time period, historians infer the political leanings of MPs from their roll-call votes. Our coding of the MPs' political parties comes from the biographical dictionary.

[15] The basis for this database are the records of the Slave Compensation Commission, set up to manage the distribution of compensation to slave owners after abolition. Information on other individuals linked to estates in the West Indies ensures that we are also capturing indirect links to slaveholding interests.

code as members of the gentry those MPs whose name was preceded by "Sir," "Arm," (for armiger), Baronet or "Esq" (for esquire). To capture MPs' educational background, which could have affected their ideology, we rely on biographical data to code an indicator for those who attended Oxford or Cambridge. Finally, we rely on biographical information compiled by Salter (1953) and Bebbington (2009) to code an indicator for MPs who were Protestant dissenters (i.e. Quakers or Unitarians).

4.3 Control variables

We collect a number of control variables at the parish, CRD or constituency level. We measure the distance from a spatial unit's centroid to London and to the nearest point on the coastline, port (Alvarez-Palau and Dunn 2019), and navigable river (Satchell, Shaw-Taylor and Wigley 2017). We include a control for latitude to account for broad differences in geography and patterns of industrialization between North and South of England. We compute measures of terrain ruggedness, average elevation, slope and suitability for wheat production using data from the Food and Agriculture Organization (FAO). We also construct two time-varying controls. To proxy for the intensity of campaigning for abolition at the local level, we control for the log number of Quaker meeting houses. We digitized these data from Butler's *The Quaker Meeting Houses of Britain* (1999, volumes I and II). To proxy for class structure and account for the fact that industrialization was precipitated by the rise of the gentry (Heldring, Robinson and Vollmer 2021), we include an estimate of the log number of gentry in each parish each year, exploiting a large genealogical database provided by Cummins (2017).

For the MP-level analysis, which focuses on a single cross-section, we control for log population at the constituency level in 1831 from Dod (1832) and log population density by dividing population with a constituency's area. We also control for an index of market integration, measuring the travel distance between any given constituency and all other constituencies weighted by population, and for the distance from the nearest urban center, defined as a city of over 20,000 persons from Bosker, Buringh and Van Zanden (2013).

5 Industrialization and support for abolition

In this section, we establish a connection between industrialization and anti-slavery ideology at the aggregate level. We begin by demonstrating that industrializing parishes submitted more petitions to Parliament in support of abolition. Next, and consistent with a mechanism of changing ideology and values driven by structural transformation, we show that industrializing parishes also petitioned more on other issues related to reform and religious freedom. Finally, we analyze the content of news articles on slavery and find that publications in industrial districts were more likely to discuss the issue in moral than in economic terms.

5.1 Petitioning activity

Anti-slavery. We begin with an analysis of aggregate support for abolition at the parish level. Variation over time in petitions and our proxies of industrial growth allow us to examine

how changes in industrial activity affected changes in petitioning while keeping fixed any time-invariant unobservable characteristics of parishes. Our baseline specification is

$$\textit{Log number of petitions}_{it} = \beta_1 I_i \times G_t + \theta_i + \lambda_t + u_{it} \tag{1}$$

where *Log number of petitions*$_{it}$ is the natural logarithm of the number of anti-slavery petitions sent to Parliament from parish i in year t.[16] I_i is a cross-sectional measure of propensity to industrialize (either the proportion of a district's area that is over coal-bearing bedrock or the logarithm of water mills in the 1400s) and G_t is a time-varying nationwide proxy of industrialization in year t (either total coal consumption in England or an index of industrial output). θ_i and λ_t are parish and year fixed effects. The coefficient of interest here is β_1, which measures how petitions respond to changes in industrialization at the local level.

Estimates from this specification are presented in Columns 1 and 4 of Table 2 and indicate that, as districts became more industrial, they sent more anti-slavery petitions to Parliament. The estimate in column 1 implies a 5% differential increase in the number of petitions sent by parishes with the largest area share over coal deposits compared to those without coal over the period of study. Column 4 indicates that this difference increases to 11.6% between parishes without water mills and those with the maximum number of water mills (4) over the entire period.

In Columns 2 and 5 we account for the possibility that parishes with coal deposits or water mills were different in other dimensions, and it was those differences that drove increases in petitioning over time. We interact year fixed effects with a number of geographic controls, allowing parishes to be on different trends depending on their terrain and soil conditions (ruggedness, elevation, slope, suitability for wheat) and their location (latitude, distance to London, to nearest port, nearest coastline and nearest navigable river). The time-varying effect of coal supply and water mills is somewhat reduced, but remains large and significant. In Columns 3 and 6 we control for the log number of gentry and the log number of Quaker meeting houses. The latter is possibly endogenous, as Quakers likely centered their campaigns in rapidly industrializing locations. However, including a measure of Quaker meeting houses allows us to control for the growing influence of religious dissenters at the local level. These controls do not significantly change the estimated effect of industrialization.

[16] There are zero petitions in some parishes and years. We construct the dependent variable as log(1+petitions), but our results remain robust to an inverse hyperbolic sine transformation (Appendix Tables B.2 and B.3).

Table 2. Industrialization and support for abolition

Dependent variable	Log number of petitions					
	(1)	(2)	(3)	(4)	(5)	(6)
Coal area×Coal consumption	0.0955***	0.0878***	0.0877***			
	(0.0118)	(0.0126)	(0.0126)			
Log water mills×Industrial output				0.00362***	0.00340***	0.00338***
				(0.000785)	(0.000772)	(0.000772)
Observations	193424	193424	193424	193424	193424	193424
R-squared	0.300	0.310	0.310	0.300	0.310	0.310
Mean dep. variable	0.0331	0.0331	0.0331	0.0331	0.0331	0.0331
Year FE × Controls		✓	✓		✓	✓
Time-varying controls			✓			✓

Notes: Robust standard errors, clustered at the district level, in parenthesis. Conley standard errors using a distance cutoff of 100 km reported in brackets. Time-invariant controls include ruggedness, elevation, slope, latitude, wheat suitability, log distance to London, log distance to nearest port, log distance to the coastline, log distance to nearest navigable river, log distance to nearest urban center and index of market integration. Time-variant controls include the log of Quaker meeting houses and the log number of gentry. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

Even after accounting for differential trends in petitioning across parishes with different location, geography and climate, the possibility remains that coal deposits and water mills are correlated with unobservable parish characteristics. As coal consumption and industrial production strictly increase over time, it is likely that petitioning activity is driven by the growing influence of these unobservables, rather than the effect of industrialization. To address this concern, we use an instrumental variables analysis which relies on the fact that the locations of early water mills were constrained by features of the physical environment.

In the thirteenth century, textile manufacturing shifted to hilly locations in the northern and western countryside, where specialized mill wrights were present and where the topography was appropriate for mill construction (Mokyr, Sarid and van der Beek 2022). The main geological feature that determined the early and persistent location of mills was the water power potential of locations. Basic principles of hydraulics suggest that the maximum hydropower that can be generated from a waterwheel or turbine is a function of the *flow* and *head* available at a site. Head is the elevation differential between where water enters and exits the wheel or turbine.[17] Gordon (1983) applies this principle to identifying locations with high water power potential in Britain and approximates potential with the product of a river's flow and fall in each point of a drainage basin. We follow the same approach and instrument the location of medieval water mills with the product of average river flow and terrain slope in a parish.

[17]Specifically, maximum water power generated at a site is given by $P = m \times g \times H \times \eta$, where m is the mass flow rate, H is the net head, g is the gravitational constant and η is the product of efficiencies of the components of the hydraulic system. As g and η are the same across locations, differences in potential water power in our case are determined by the product of mass flow rate and net head.

Table 3. Industrialization and support for abolition, IV results

Dependent variable	Log number of petitions		Log water mills	Log number of petitions	
	OLS	Reduced form	First stage	2SLS	
	(1)	(2)	(3)	(4)	(5)
Log water mills×Industrial output	0.00590***			0.316***	0.194**
	(0.00128)			(0.109)	(0.0806)
Flow×Slope×Industrial output		0.0249***	0.0787***		
		(0.00414)	(0.0246)		
Observations	193424	193424	193424	193424	193424
R-squared	0.301	0.301	0.933		
Mean dep. variable	0.0331	0.0331	0.270	0.0331	0.0331
KP F-stat				10.23	9.67
Year FE × Additional controls					✓

Notes: Robust standard errors, clustered at the parish level, in parenthesis. Conley standard errors using a distance cutoff of 100 km reported in brackets. All columns include interactions of year fixed effects with terrain slope and with mean river flow from the five gauging stations nearest to a parish centroid. Additional time-invariant controls include ruggedness, elevation, latitude, wheat suitability, log distance to London, log distance to nearest port, log distance to the coastline, log distance to nearest navigable river, log distance to nearest urban center and index of market integration. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

We use data on daily mean river flow from the UK's National River Flow Archive (NRFA), which collects hydrometric data from gauging stations across the country. We average daily mean flow across the five gauging stations that are closest to a parish's centroid, and we set to zero the daily mean flow of parishes that are not intersected by a river. We then multiply average mean daily river flow with the average terrain slope index in a parish.[18] Throughout, we independently control for mean river flow and slope, so that water power potential is predicted only by the product of these two variables. This means that e.g. among parishes on a river with high mean flow, only those with a steep terrain will be assigned a high water power potential. Figure B.3 shows that the first stage in the cross-section of parishes is strong, and becomes stronger when outliers with very high or low water power potential are removed.

Table 3 presents the results of the IV analysis for the panel of parishes.[19] For ease of comparison, column 1 displays the OLS estimate of the time-varying effect of water mills conditional on parish slope and mean river flow (both interacted with year fixed effects). Column 2 presents the reduced form effect of the proxy of water power potential on petitions. The estimate is large and significant. Consistent with the cross-sectional correlation in Figure B.3, column 3 shows that the first stage is strong. Column 4 presents 2SLS results. The KP F-statistic is above 10, which is the rule of thumb threshold for weak instrument detection. The 2SLS estimate is orders of magnitude larger than OLS estimates. A likely explanation for this is the presence of measurement error, as information on medieval mills captures but

[18]Terrain slope data is from FAO and described in Table A.1. Lower values correspond to higher slope.

[19]Table B.4 in the Appendix presents a cross-sectional analog of Table 3, using the total number of petitions between 1787 and 1833 as the dependent variable. Results are qualitatively very similar to the panel analysis, confirming that our findings are not driven by the fact that both instrument and endogenous regressor are multiplied by the time-varying index of industrial output.

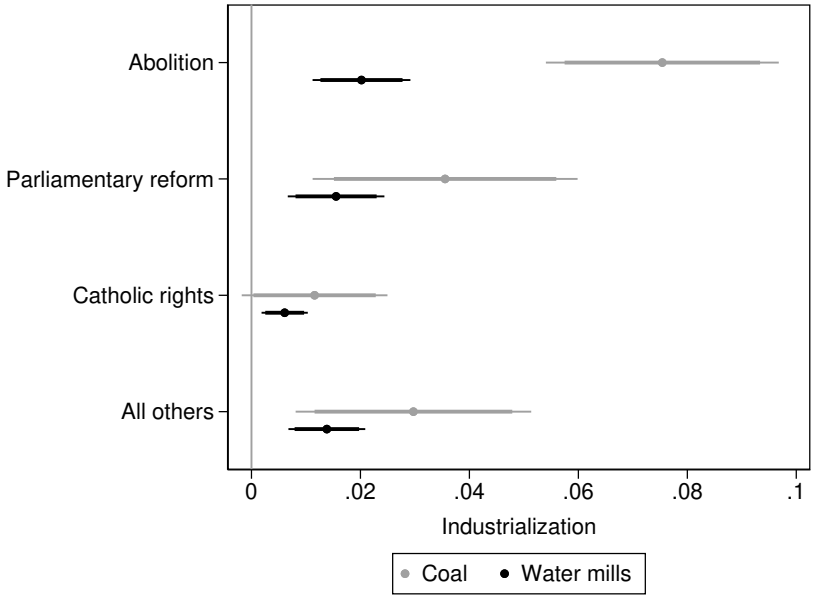
a snapshot of water power usage in England in the fourteenth century, while modern-day geographic data measures water power potential much more accurately. Column 5 displays 2SLS estimates after inclusion of the full list of parish-level controls interacted with year fixed effects. This has a small effect on the predictive power of the instrument, but the effect of water mills remains large and significant. All in all, this analysis confirms the finding that industrialization led to higher petitioning activity against slavery between 1787 and 1833.

Other issues and broader ideology. Abolitionism was but one component of the broader values and ideology of elites and populations in locations that experienced economic transformation through industrialization. More rapidly industrializing parishes displayed more intense petitioning activity not only on the question of slavery, but also on other issues broadly associated with reform and the expansion of rights to minorities.

Using information from the Journal of the House of Commons, we geocode petitioning campaigns that occurred during the same period as those against slavery. We focus on two of the largest campaigns, those on parliamentary reform and on Catholic rights. Campaigns for parliamentary reform aimed at the extension of the franchise and more balanced representation. They effectively requested redistribution of political power from small constituencies dominated by wealthy patrons (the "rotten boroughs") to towns that had grown in size due to industrialization, but were not represented in Parliament. Campaigns on Catholic emancipation were focused on the repeal of restrictions on religious minorities (Catholics and Dissenters), including restrictions on holding public office.

Figure 2 displays coefficient estimates for $I_i \times G_t$ from specifications like the one in equation 1 using our two different time-varying proxies of industrialization, but replacing the dependent variable with the log number of petitions on different issues.

Figure 2. Industrialization and other petitioning campaigns



Notes: The figure displays estimates of the coefficient on $I_i \times G_t$ from specifications as in Column 2 in Table 2. Standardized beta coefficients reported. Thick and thin lines represent, respectively, 90 and 95% confidence intervals. Underlying estimates are displayed in Table B.5 in the Appendix.

The first thing to note is that industrial activity increased the overall propensity to send petitions to Parliament, consistent with higher urbanization rates and increased associational activity creating fertile ground for "mass politics" (Quirk and Richardson 2010; Tilly 2015). At the same time, abolition appears to have had more support than other causes in industrializing parishes.[20] Figure 2 also reveals that industrializing parishes had different petitioning priorities from other parishes. The positive association between industrialization and the propensity to petition for the rights of religious minorities is reflective of the same liberal attitudes that motivated agitation against slavery. Industrialization also positively predicts petitions for parliamentary reform. This pattern is consistent with economic change leading to demand for reform in a direction that would increase the political power of rising social strata. It supports the findings in Fresh (2020) as well as a mechanism in which structural transformation drives both political and social change.

5.2 Anti-slavery in the press

A first step towards understanding what drove the abolitionist movement is to examine how the topic of slavery was discussed in the press of industrial locations and the extent to which

[20]Panel C of Table B.5 displays 2SLS estimates of the coefficient on *Log water mills* × *Industrial output*. In that specification, industrialization does not significantly increase petitions for parliamentary reform, and its effect on petitioning for abolition is an order of magintude larger than that on other issues.

is was framed as a moral or economic issue. To this end, we turn to the corpus of newspaper articles published between 1787 and 1833 that appear in the British Newspaper Archive (BNA) and make reference to slavery.

We estimate a Structural Topic Model (Roberts, Stewart and Tingley 2019) to detect the overarching themes present in newspaper articles on slavery and how these varied by characteristics of the publication location.[21] We present results from a model with 30 topics.[22] Expected topic proportions and words associated with each topic are displayed in Figure B.4 in the Appendix.[23]

Figure 3 compares, for a selection of meaningful topics, the estimated topic prevalence for articles in newspapers located in industrial and non-industrial districts. Results are broadly similar regardless of whether we proxy for industrialization by the share of the district over coal-bearing bedrock (left) or the log number of water mills (right).[24] Articles published in industrial districts are more likely to center around abolitionist groups and anti-slavery petitions, consistent with the results of Table 2. Instead, neutral references to the slave trade (as captured by words like *vessel, ship, trade, coast*) are less likely to appear in the industrial press. These differences across industrial and non-industrial areas are not driven by systematic differences in their political orientations. Table B.6 in the Appendix shows that, regardless of the proxy of industrialization used, newspapers published in more industrial CRDs were not more liberal than newspapers in less industrial districts.

Importantly, there is no indication that newspapers in industrial districts emphasized economic arguments in favor of abolition. Topics of economic nature such as taxes and duties or the trade in sugar were equally prevalent in industrial and non-industrial districts and the legal aspects of slave property were less frequently discussed in the former. There is no difference in the prevalence of articles related to compensations of slave owners and slavery in the context of foreign relations – most frequently the war with France – is less prevalent in industrial districts. Instead, two of the most prevalent topics in industrial publications are the

[21] We implemented a standard set of pre-processing steps, by removing stop-words, numbers, punctuation, words shorter than two letters, and words used less than 10 times across all articles.

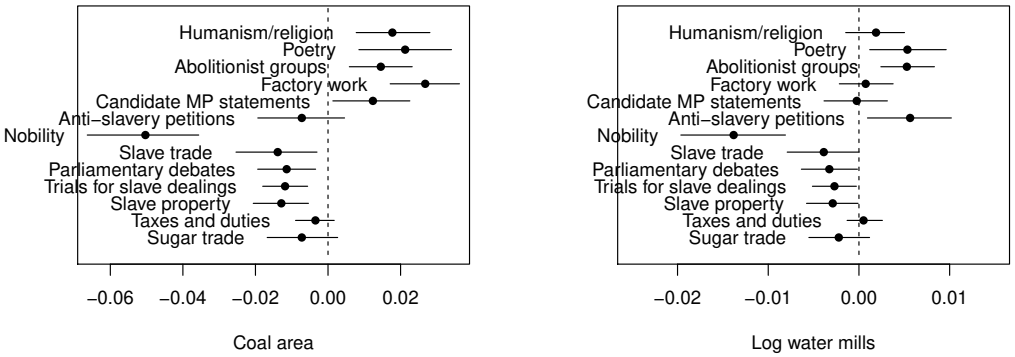
[22] We converge to this number of topics following a procedure similar to the one in Roberts et al. (2014). We first estimated a series of structural topics models varying the number of topics from 15 to 50, in increments of 5. We then restricted attention to models on the semantic coherence-exclusivity frontier. Semantic coherence captures topics' internal consistency and exclusivity captures the extent to which topics can be differentiated from each other. Semantic coherence decreases with the number of topics and displays sharper drops between 20 and 25 and 30 and 35 topics. We manually inspected models with 20 and 30 topics, and concluded that the latter number captures a wider range of meaningful topics, including those of substantive interest to us, namely topics related to Enlightenment and religious values.

[23] Some topics collect articles that do not have meaningful content, due to the low quality of OCR conversion. BNA provides text versions of newspaper images, produced using OCR software. The OCR technology used by BNA is superior to any single commercial OCR software, such as ABBYY FineReader, so we would not have been able to improve on the quality of the text by independently converting the underlying image files to text.

[24] Different definitions of the measures of industrial activity (distance to nearest coal deposit or water mill and share of employment in manufacturing in 1831) yield comparable results (Appendix Figure B.5).

ones we term "Humanism/religion" and "Poetry". The former characterizes articles in support of abolition whose arguments draw both from Christian theology and from humanist and Enlightenment ideas such as individuals' inalienable right to freedom, equality, and fraternity among humans of different origins.

Figure 3. Topics of articles on slavery by location of publication



Notes: The figure displays the estimated difference in the prevalence of different topics across districts by share of area over coal-bearing bedrock (left) or the log number of fourteenth century water mills (right).

For instance, an article published in the Cheltenham Chronicle in April 1833, attacks slavery as follows: "'Thou shalt love thy neighbor as thyself,' under which term we believe are comprehended our fellow creatures of every nation, tongue and colour. ... Can there be a greater violation of his righteous law, than to buy and sell our fellow men, to claim a right of property in them and their offspring, to hold in perpetual bondage those for whom, as for us, Christ died!" An article published in multiple newspapers in November 1832 prints a candidate MP statement that contains a similar argument: "The right of the slave to be raised from the level of the brute creation, to which he has been sunk through no fault of his own, and to be restored to that of human nature, in which he was created by his Maker, can be denied by none, as an universal rule or maxim..."

The second topic, "Poetry", is dominated by poems against slavery, frequently imbued by the same humanist principles and condemning the institution as brutal and repugnant. An example from the Derby Mercury published in April 1823, is titled "Appeal to Britain – On the Slave Trade" and reads as follows:

> Though thy name may be quoted again and again,
> As a nation of freemen, a kingdom of men;
>
> Yet a stain will be on thee, will tarnish thy name,
> And a spot of dishonour will sully thy fame,
> The blood of the slave thy fair honour shall stain.

This particular poem appealed to British exceptionalism as well as to a sense of honor, which scholars like Drescher (2002) and Appiah (2011) have identified as crucial for the change in attitudes on slavery.[25] For our argument, two conclusions are important to highlight. First, all topics with higher prevalence in publications of industrial districts were largely pro-abolition. Second, anti-slavery articles in industrial districts based their stance on almost exclusively moral arguments, among which liberal and humanist ideals were common.

Taken together, the results of this section establish a strong link between industrializing locations and the growth of the abolitionist movement. However, the aggregate nature of the correlations presented does not allow us to arbitrate between competing theories on the role of different social classes in the drive for abolition. Petitioning campaigns could be mainly driven by middle classes reacting to economic transformation in industrializing areas (Drescher 1986), or by the working class attacking slavery in an attempt to defend the dignity of labor (Appiah 2011). To identify a more direct link between the industrial elite and anti-slavery, we turn to the behavior of MPs.

6 The role of industrial elites

Was the aggregate connection between industrialization and abolitionism driven by popular demand and mass agitation in rapidly growing urbanizing locations? Or did new elites with distinct values and ideas play a role in spearheading the movement? In this section, we attempt to elucidate the role of industrial elites by moving to the analysis of individual-level data. We demonstrate two patterns. First, economic interests tied to manufacturing robustly predict support for abolition among a dataset of British MPs. Second, we provide evidence that industrialists played a leading role in anti-slavery petitioning campaigns.

6.1 Industrial interests and support for abolition

MP-level data allow us to directly measure the individual-level link between industrial interests and stance on the issue of slavery. Using a cross-section of MPs' voting behavior on the Slavery Abolition Act of 1833, we estimate variations of the following equation:

$$\textit{Anti-slavery vote}_i = \alpha + \gamma_1 \textit{Industrial interests}_i + \gamma_2 \mathbf{P}_i + \gamma_3 \mathbf{C}_i + u_i \tag{2}$$

where *Anti-slavery vote*$_i$ is an indicator for MPs who i voted at least once with the anti-slavery party in the parliamentary discussion of the Slavery Abolition Act of 1833, and *Industrial interests*$_i$ is an indicator for industrialist MPs. $\mathbf{P}_i$ and $\mathbf{C}_i$ stand for vectors of MP and constituency characteristics, respectively. We progressively add those individual-level and constituency-level controls in more stringent specifications.

[25] That abolition was cast as a matter of national honor for Britain, especially after the loss of the American colonies, has been highlighted by several scholars. In the aftermath of the defeat, abolition was a means for the British Empire to regain its legitimacy through displaying its moral virtue (Brown 2012).

Table 4. Industrial interests and MP voting behavior

Dependent variable	Voted in favor of abolition			
	(1)	(2)	(3)	(4)
Industrial interests	0.362***	0.284***	0.301***	0.212**
	(0.0924)	(0.0881)	(0.102)	(0.0972)
Slave owner		-0.186***		-0.191***
		(0.0657)		(0.0650)
Liberal		0.184***		0.148***
		(0.0472)		(0.0513)
Radical		0.382***		0.352***
		(0.0552)		(0.0584)
Protestant dissenter		0.190		0.207*
		(0.116)		(0.123)
Gentry		-0.0202		-0.0194
		(0.0612)		(0.0672)
Oxbridge graduate		0.00291		-0.0163
		(0.0443)		(0.0468)
Log distance to port			-0.0223	-0.0219
			(0.0204)	(0.0207)
Log distance to London			0.0215	0.0166
			(0.0313)	(0.0324)
Log distance to river			-0.00952	-0.0102
			(0.0172)	(0.0177)
Log distance to coast			0.00432	0.0158
			(0.0222)	(0.0217)
Latitude			-0.0269	-0.0346
			(0.0284)	(0.0296)
Ruggedness			-0.00173	-0.00142
			(0.00119)	(0.00121)
Elevation			0.0115	0.0197
			(0.0572)	(0.0575)
Slope			-0.00297	-0.00335
			(0.00426)	(0.00444)
Wheat suitability			-0.00246	-0.00133
			(0.00172)	(0.00177)
Log population			0.0204	0.0258
			(0.0304)	(0.0303)
Log population density			0.0298*	0.0297*
			(0.0154)	(0.0161)
Market integration index			0.00707	0.00829
			(0.0194)	(0.0204)
Log distance to urban center			0.00839	0.0211
			(0.0230)	(0.0226)
Log quaker houses			0.127***	0.114***
			(0.0395)	(0.0394)
Log number of gentry			-0.0416	-0.0413
			(0.0275)	(0.0269)
Observations	555	500	521	472
R-squared	0.0240	0.127	0.0850	0.182
Mean dep. variable	0.375	0.390	0.372	0.386

Notes: The table reports OLS estimates from equation 2. For variable definitions see Section 4 and Table A.1. Robust standard errors in parenthesis. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

Column 1 of Table 4 displays a strong positive correlation between MP economic activity and voting behavior. Industrialist MPs were, on average, 36.2 percentage points more likely to have voted at least once with the anti-slavery party in Parliament during the discussion of

abolition than MPs without industrial interests. Column 2 controls for whether the MP was a slave owner, the MP's political leaning, and whether the MP was a Protestant dissenter, a member of the gentry, or attended Oxford or Cambridge.[26] As expected, owning slaves in the West Indies significantly reduced support for abolition. Equally unsurprising is the strong positive correlation between opposition to slavery and Liberal and Radical leanings. As Kaufmann and Pape (1999) show, both Whigs and Radicals and other reformists were clearly united in their anti-slavery stance between 1770 and the early 1800s, while Tory positions on the issue were more mixed. Consistent with the historical view that Protestant dissenters were leaders in the abolitionist movement, we find that religious dissenter MPs were more likely to support abolition, but this estimate misses conventional statistical significance.[27] Finally, we find no correlation between attitudes towards abolition and being a member of the gentry or having attended Oxbridge.

In Columns 3 and 4, we control for constituency-level characteristics.[28] Only population density and the number of Quaker meeting houses consistently predict MPs' anti-slavery positions. This is unsurprising, as urbanization, religious dissent and anti-slavery sentiment were closely connected at the local level (Quirk and Richardson 2010). Industrial interests remain a strong and significant predictor. All told, the results in Table 4 suggest that industrial interests are not confounded with party positions, background characteristics like religion or education, or constituency-level factors. Industrial interests have similar predictive power for MPs' anti-slavery stance as political orientation and religious views.

The link between industrial interests and a pro-abolitionist stance is present in earlier periods as well. Data on MP nominal votes on the question of the slave trade are not available, but we are able to infer MP positions on the issue through speeches in the 1792 and 1806-07 parliamentary debates.[29] We rely on *The History of Parliament Online* to identify the economic interests of MPs. Out of the four MPs with industrial interests that expressed their views in parliament, three voted in favor of the abolition of the slave trade.

6.2 Industrialists as leaders of the abolitionist movement

To corroborate the link between industrial interests and support for abolition beyond the narrow sample of MPs, as well as to provide direct evidence on the central role of industrial

[26] The sample size decreases from 555 to 500 because of missing data on the personal characteristics of MPs.

[27] There were 13 MPs who were religious dissenters: a Quaker (Joseph Pease), a Wesleyan, a Bible Christian, and ten Unitarians. Thomas Fowell Buxton, the leader of the abolitionist movement in parliament, had a Quaker mother, but we do not count him as a religious dissenter.

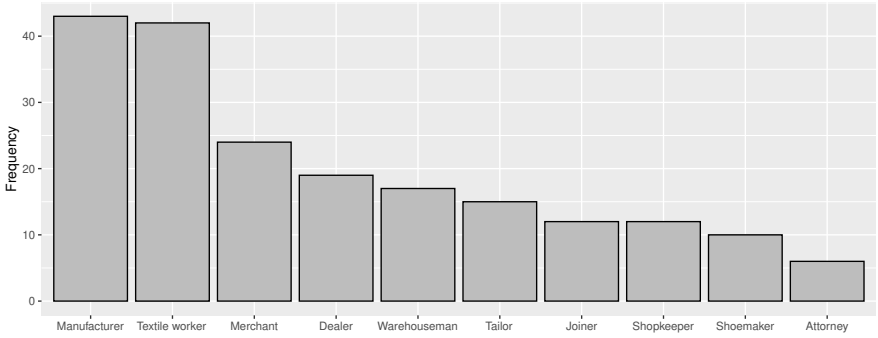
[28] We cannot compute constituency-level variables for MPs elected in non-territorial (university) constituencies.

[29] The 1792 speeches are available in Cobbett. The Parliamentary History of England. Vol 29. Pages: 3250-259, 1055-1158, 1203-1293. The 1806-7 speeches are available in Cobbett. Parliamentary Debates. Vol 6. Pages: 597-599, 805, 917-919, 1027-1029; Cobbett. Parliamentary Debates. Vol 7. Pages: 31-34, 227-236, 580-603, 801-809, 1142-1145; Cobbett. Parliamentary Debates. Vol 8. Pages: 257-259, 431-432, 601-602, 612-618, 657-672, 677-683, 691-693, 701-703, 717-722, 945-995, 1040-1053; and Cobbett. Parliamentary Debates. Vol 9. Pages: 59-66, 114-140, 168-170.

elites in the abolitionist movement, we turn our attention back to petitioning campaigns.

One of the few anti-slavery petitions that survived the Westminster fire of 1834 was produced in 1806 in Manchester, the major industrial city of nineteenth-century Lancashire. As the world's first industrial city, Manchester offers a good setting for studying industrial leadership.[30] The surviving petition, signed by 2,348 individuals, was encouraged by abolitionist leader Thomas Clarkson in response to an anti-abolitionist petition presented to the House of Lords. We use the transcript of the petition produced by the Manchester and Lancashire Family History Society (MLFHS). MLFHS manually matched petitioners to three contemporaneous trade directories: *Scholes's Manchester and Salford Directory* (1797), *Bancks's Manchester and Salford Directory* (1800) and *Dean's Trade Directory of Manchester and Salford* (1808). Unambiguous matches were found for 312 individuals, 281 of which had an occupation listed.[31] Figure 4 displays the ten most frequent occupations of the 281 signatories that could be merged to the trade directories. Manufacturers are the most common occupation (43 petitioners), followed by textile workers such as weavers, spinners, and dyers (42 petitioners), merchants (23 petitioners), dealers (19 petitioners), warehousemen (17 petitioners), and tailors (15 petitioners).[32]

Figure 4. Top 10 most frequent occupations of Manchester petition signatories



Notes: The figure displays the frequency of the most common occupations among the 218 signatories of the 1806 Manchester anti-slavery petition that could be matched to trade directories.

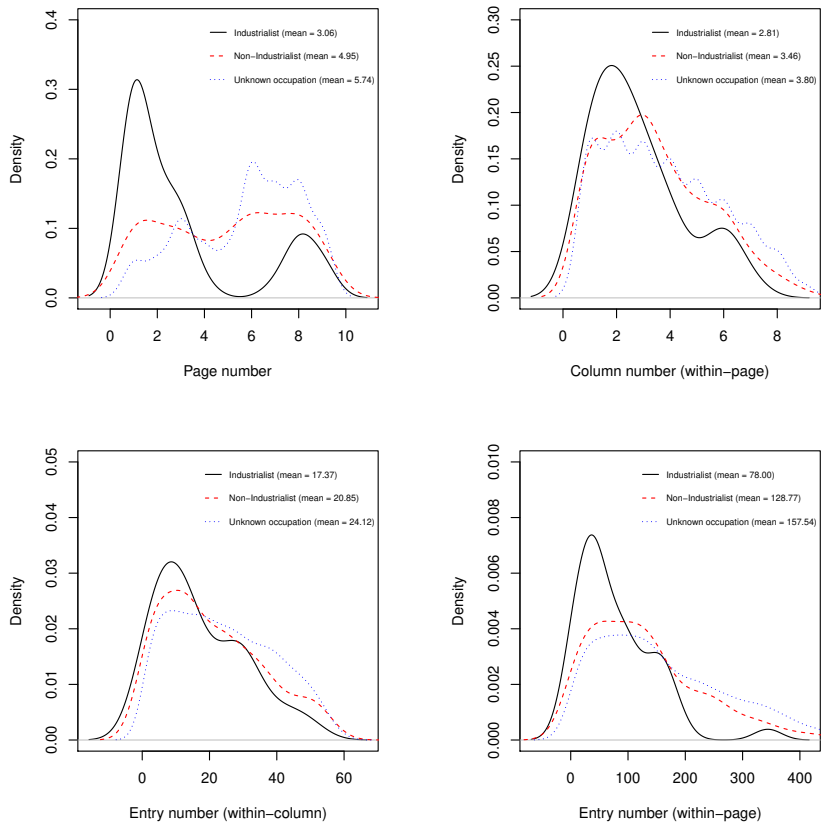
[30] De Tocqueville describes his impression of Manchester in 1835 in his "Journeys to England and Ireland" as "The great manufacturing city for cloth, thread, cotton ... Thirty or forty factories rise on the tops of the hills I have just described. ... Here humanity attains its most complete development and its most brutish; here civilisation works its miracles, and civilised man is turned back almost into a savage." de Tocqueville (1958, pp.104-107). Engels wrote "The Conditions of the Working Class in England" in Manchester, and Marx and Engels wrote the material that later ended up being published as the Communist Manifesto during their time in Manchester.

[31] The remaining had a an address listed, but no occupation. The matching is conservative. In our communication with MLFHS, they confirmed that they "only added details when absolutely sure there was no ambiguity" about whether the person had signed the petition. The final number of petitioners matched to directories is similar to Pinarbasi (2020), who matched 290 individuals to Bancks 1800 and Dean 1808.

[32] Three individuals are merchants and manufacturers, so they are counted twice here.

The numbers of petitioners presented in Figure 4 are not normalized by the total number of individuals in each occupation in the city. Since Manchester was an industrial center, it is perhaps not surprising that manufacturers and textile workers make up the bulk of petitioners in the 1806 campaign. What stands out is that textile workers – who almost certainly represented a broader group than factory owners – and manufacturers have signed the petition in equal numbers. This indicates that industrial elites were over-represented among abolitionist petitioners relative to industrial workers.

Figure 5. Signature order by occupation in the 1806 Manchester petition



As an additional measure of centrality in the abolitionist movement, we use the order of signatures. A big part of signature collection on petitions in Britain was not done through door to door canvassing, but through the posting of petitions in central locations of a town, such as inns, shops or churches (Makovi 2019; Huzzey and Miller 2020). Individuals would then have to walk to these locations to sign the petition, making the order of signatures an informative measure of the degree of involvement to the movement. The 1806 Manchester petition comprises nine sheets of parchment stitched together as a five-meters-long roll.[33] Each sheet contains several columns, each consisting of multiple signatures. With the exception of

[33]Figure B.6 in the Appendix depicts the petition document.

the first page, which bears the text of the petition, some uncertainty exists as to whether the remaining sheets of paper were stitched together in order, or haphazardly. For this reason, we use four alternative proxies of signature order: (1) the number of the page where a petitioner signed, (2) the column number within its corresponding page, (3) the entry number within its corresponding column, and (4) the entry number within its corresponding page.

Figure 5 displays the distribution of each of the four variables for three subgroups of the data: industrialists (solid black curve), non-industrialists (dashed red curve), and petitioners with unknown occupations (dotted blue curve). Across measures, the distribution of the order of entries by manufacturers is consistently to the left of the respective distribution for other occupations, indicating that industrialists signed the petition earlier than others. Table 5 confirms this pattern for average signature order. The difference between industrialists and other signatories of known occupations is consistently large and significant at the 1% level.

Table 5. Signature sequence in the Manchester petition

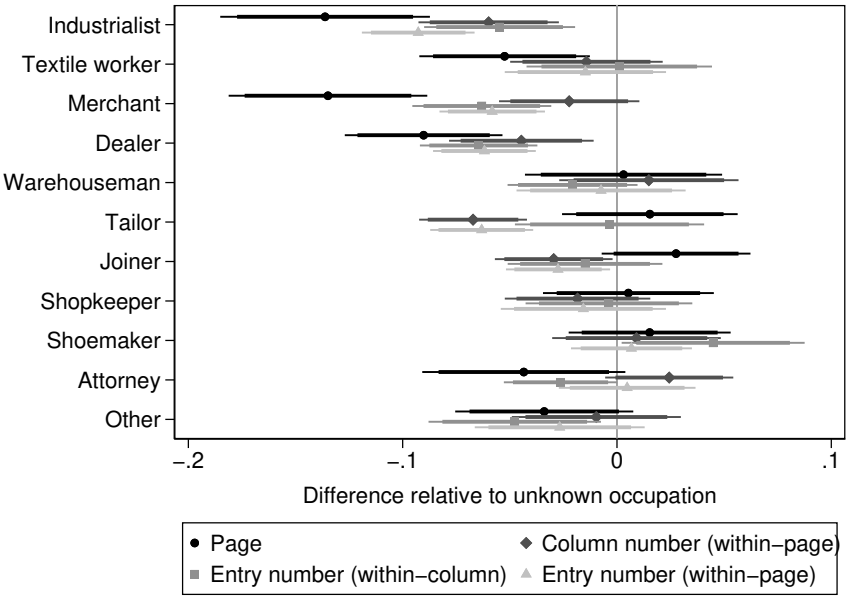
Dep. variable	Page number	Column number (within-page)	Entry number (within-column)	Entry number (within-page)
	(1)	(2)	(3)	(4)
Industrialist	-2.672***	-0.989***	-6.744***	-79.54***
	(0.428)	(0.264)	(2.021)	(10.55)
Non-industrialist	-0.788***	-0.340**	-3.259***	-28.77***
	(0.182)	(0.137)	(1.015)	(6.722)
Observations	2348	2348	2348	2348
R-squared	0.0307	0.00589	0.00765	0.0153
Mean dep. variable	5.613	3.750	23.66	153.2

Notes: OLS estimates reported. The sample consists of individuals who signed the 1806 Manchester petition. Each dependent variable is a different measure of signature order. *Industrialist* is an indicator for individuals with known occupation whose occupation was listed as "manufacturer." *Non-industrialist* is an indicator for individuals with any other known occupation. The base category are signatories who were not linked to trade directories by MLFHS and whose occupation is unknown. Robust standard errors in parenthesis. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

In Figure 6, we break down the difference in average signature order by occupation, for the 10 most frequent occupations among petitioners. The number of individuals in each occupational category is small, but despite the lack of power two patterns can be observed. First, elites have a relatively prominent position in this petitioning campaign. Industrialists, merchants and dealers sign the petition earlier than textile workers on average. Second, the data suggests a leadership role for industrialists and merchants, the two occupational categories who are on average most likely to sign the petition first. According to three out of the four measures used, industrialists have a lower signature order. These differences are not always statistically significant, but they are nonetheless supportive of a central role for manufacturers. No clear pattern emerges for other skilled occupations, with the variation in

signature order being substantive, both across occupations and sequence measures.

Figure 6. Effect of occupation on signature order



Notes: The figure displays standardized point estimates from a regression of different measures of signature order on indicators for the occupations listed on the y-axis. Thick and thin lines display, respectively, 90% and 95% confidence intervals. The base category is signatories with an unknown occupation. Underlying regression results are provided in Table B.7 in the Appendix.

These results indicate that manufacturers held a prominent position among participants in petitioning campaigns. While industrialization could have led to mass support for abolition through other channels, such as higher associational activity, urban density and general agitation for reform, the evidence also supports a leading role of industrial elites in the movement. In the next section, we provide additional evidence that industrialists' abolitionist stance was not a result of bottom-up pressures, but rather an expression of their ideology and values, which set them apart from other British elites.

7 Mechanisms

Why did industrialists support abolition? Broadly speaking, ending slavery was not against the economic interest of industrial elites, who could profit from a move away from the mercantilist system that supported slavery in the colonies and towards free trade. At the same time, abolition was costly business for the productive classes of Britain. The overall economic cost to British society of the anti-slavery efforts was estimated at roughly 1.8 percent of national income over sixty years from 1808 to 1867 (Kaufman and Pape 1999, p. 636). Historians have also debated the extent to which industrialists, though behaving according to their best interest, did so *consciously*, or rather motivated by a set of values and ideas that aligned with

their material incentives (Ashworth et al. 1992).

In this section, we explore the pathways driving industrialists' anti-slavery stance. We proceed in two steps. First, we show that pro-abolition votes of industrialist MPs were not predicted by their stance toward or personal interest in mercantilism and they were not driven by constituents' direct demands or grievances. Next, we show that industrialists were characterized by distinct ideology and moral values, which manifested in their broader discourse and not only on the issue of slavery. Taken together, our evidence supports a mechanism of value change through the rise of distinct ideological types driven by the process of structural transformation.

7.1 The role of material interest

One economic-centered explanation for manufacturers' opposition to the slave trade and slavery was that the colonial system of sugar and cotton production was subsidized and directed resources away from more productive domestic investment. This view was best expressed by Adam Smith, who in *The Wealth of Nations* stated that "The prosperity of the English sugar colonies has been, in great measure, owing to the great riches of England, of which a part has overflowed ... upon those colonies" (Smith [1776] 2013, p.302). Smith not only believed the sugar economy to embody those artificial restrictions of free market activity that he opposed, but also saw the system of slavery on which this economy relied as inefficient, since "A person who can acquire no property, can have no other interest but to eat as much, and to labor as little as possible" (Smith [1776] 2013, p.207). Abolition of slavery and the dismantling of the sugar monopoly would free up capital to the benefit of domestic industrial production.

If an anti-mercantilist stance was the main driver of support for abolition, we would expect MPs' views on free trade to be predictive of their votes and soak up part of the effect of industrial interests. Yet this is not the case. Column 1 of Table 6 replicates the specification with full controls in column 4 of Table 4 for comparability. Column 2 includes controls for MPs' positions on free trade and on the Corn Laws, as recorded in their biographies. Industrialists were on average supportive of free trade ($p < 0.0026$) and not significantly different from non-industrialists in their positions on agricultural tariffs ($p < 0.3875$), but neither of these positions significantly correlates with anti-slavery votes; controlling for them barely affects the estimate on industrial interests.

We next examine whether variation in the extent to which industrialists depended on the colonial monopoly influenced their stance on slavery. Textile manufacturers relied on raw material from the colonies and may have been more aligned in their interests with the planter group. The sole industrialist MP who opposed the abolition of the slave trade in 1806 was Sir Robert Peel, who made a large fortune out of cotton-spinning and who perceived the trade as central to the textile industry's survival. However, the correlation between textile interests and anti-abolitionist views does not appear to be systematic. Column 3 of Table 6 reveals no significant difference between textile manufacturers and other industrialists in terms of anti-slavery attitudes.

Table 6. The role of anti-mercantilism

Dependent variable	Anti-slavery vote		
	(1)	(2)	(3)
Industrial Interests	0.212**	0.209**	0.218**
	(0.097)	(0.098)	(0.103)
Free Trade		-0.020	
		(0.077)	
Corn Laws		0.032	
		(0.062)	
Textile manufacturer			-0.025
			(0.213)
Observations	472	472	472
R-squared	0.182	0.183	0.182
Mean dep. variable	0.386	0.386	0.386

Notes: The table reports OLS estimates from a specification following equation 2. All regressions include MP- and constituency-level controls from Column 4 of Table 4. Robust standard errors in parenthesis. *Free Trade* is an indicator for MPs who supported free trade and *Corn Laws* is an indicator for MPs who supported the Corn Laws. *Textile manufacturer* is an indicator for MPs who owned a textile factory. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

An alternative explanation for MPs' voting behavior that is consistent with self-interest is that they responded to demands from below. If manufacturers were more likely to represent constituencies with a larger working class population, they may have merely being channeling in Parliament the broader anti-slavery sentiment present among their constituents (Gross 1980). Though catering to voters was not as central a driver of MP behavior in England during a period of limited franchise as it is in modern democracies, Table 7 investigates this possibility. In columns 2 and 3 we control, respectively, for the share of a constituency's area that lies over coal-bearing bedrock and the log number of water mills, as proxies of the constituency's reliance on industry. Both of these variables are significant predictors of an MP's vote, but do not eliminate the influence of individual involvement in industry. In column 4 we control for the presence of textile mills in the constituency, to account for the possibility that textile manufacturing interests may have been driving MPs to oppose abolition. This variable comes from a census of industrial mills ordered by Parliament in 1838. Textile manufacturing had no independent effect on MP voting behavior over and above the individual MP's involvement in industry. Columns 5 and 6 include controls for petitioning activity in the constituency. Neither overall petitions, nor petitions in the peak year of abolitionist campaigning significantly predict MP behavior or affect the estimate on industrial interests. In column 7, we include an indicator for MPs who ran unopposed. If competition for votes was a significant predictor of MPs' stance in Parliament, we would expect this variable to affect anti-slavery votes, but this is not the case. Column 8 accounts for all of these possible sources of political pressure from below simultaneously confirming that, while industrialization at the constituency level increases the probability that an MP votes against abolition, the MP's industrial interests remain the strongest predictor of his voting behavior.

Finally, in column 6, we examine a dependent variable that more closely proxies for MPs'

electoral incentives than post-election behavior in Parliament. MPs who pledged to abolish slavery in *The Tourist* may have been driven by the desire to attract votes rather than by true commitment to the abolitionist cause.[34] Consistent with this interpretation, industrial interests do not predict pre-election pledges.

Table 7. The role of constituency pressures

Dependent variable	Anti-slavery vote								Pledged to abolish
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Industrial interests	0.212**	0.181*	0.219**	0.212**	0.227**	0.222**	0.210**	0.198**	-0.0338
	(0.0972)	(0.0987)	(0.0985)	(0.0970)	(0.0977)	(0.0965)	(0.0981)	(0.101)	(0.0956)
Coal area		0.205*						0.203*	
		(0.109)						(0.111)	
Log water mills			0.0681**					0.0616*	
			(0.0345)					(0.0351)	
Log textile mills				-0.0100				-0.00647	
				(0.0367)				(0.0351)	
Log petitions overall					0.0503			0.0430	
					(0.0397)			(0.0396)	
Log petitions 1833						0.0337			
						(0.0414)			
Ran unopposed							-0.0358	-0.0349	
							(0.0505)	(0.0504)	
Observations	472	472	472	472	472	472	472	472	472
R-squared	0.182	0.189	0.189	0.182	0.185	0.184	0.183	0.198	0.147
Mean dep. variable	0.386	0.386	0.386	0.386	0.386	0.386	0.386	0.386	0.244

Notes: The table reports OLS estimates from a specification following equation 2. All regressions include MP- and constituency-level controls from Column 4 of Table 4. *Pledged to abolish* is an indicator for MPs who pledged to abolish slavery if elected in the anti-slavery journal *The Tourist*. Robust standard errors in parenthesis. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

Finally, we examine the possibility that industrial elites promoted abolition to divert attention away from calls for domestic reform and for the alleviation of inhuman conditions for the working poor in England's factories. This argument is similar in spirit to theories of franchise extension as reforms in the face of popular revolt (Acemoglu and Robinson 2000). Many abolitionist industry leaders were intensely preoccupied with labor discipline and labor management and the anti-slavery movement developed in the backdrop of increasing social unrest driven by enclosures and the proletarianization of the rural poor (Davis 1975, p. 358, 455-462). It is conceivable that abolitionist efforts were more pronounced where such preoccupations were stronger. We rely on Horn and Tilly (1986) for a measure of labor unrest, based on the number of contentious gatherings between 1828 and 1833 in which the major issue was either wage demands or issues concerning labor organizations.[35] This measure is only

[34] A noteworthy example was Radical William Cobbett, a staunch anti-abolitionist, who pledged to abolish slavery when he ran for Parliament in Manchester, an industrial city with broad popular support for abolition.

[35] Horn and Tilly (1986) define contentious gatherings as "an occasion on which a number of persons gather in a publicly-accessible place and visibly, by word or deed, make claims that would, if realized, affect the interests of some person or group outside their own number." Counts of contentious gatherings come from newspapers and Hansard.

available at the county level ($N = 83$). Columns 2–5 of Table 8 show that labor unrest over the 1828-1833 period is positively correlated with MPs' anti-slavery votes, but that this effect is not specific to industrial MPs. This is evidence against the argument that it was factory owners in particular who would benefit from supporting abolition to deflect the grievances of the working class. In columns 6 and 7 we consider whether MPs reacted to any type of popular grievance by examining the role of Swing riots, disturbances that occurred between 1830-31 and that were shown by Aidt and Franck (2015) to have precipitated democratization in Britain.[36] We find that Swing riots made industrial MPs less likely to support abolition.

Table 8. The role of domestic order

Dependent variable	Anti-slavery vote						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Industrial interests	0.212**	0.188*	0.112	0.185*	0.152	0.220**	0.256**
	(0.097)	(0.097)	(0.177)	(0.098)	(0.139)	(0.099)	(0.106)
Log labor incidents 1828-1833		0.045*	0.042*				
		(0.024)	(0.025)				
Industrial interests×Labor incidents 1828-1833			0.041				
			(0.078)				
Log labor incidents 1833				0.060	0.055		
				(0.044)	(0.048)		
Industrial interests×Labor incidents 1833					0.034		
					(0.091)		
Log Swing riots						0.037	0.039
						(0.027)	(0.027)
Industrial interests×Swing							-0.176*
							(0.096)
Observations	472	472	472	472	472	472	472
R-squared	0.182	0.189	0.190	0.186	0.186	0.186	0.188
Mean dep. variable	0.386	0.386	0.386	0.386	0.386	0.386	0.386

Notes: The table reports OLS estimates from a specification following equation 2. All regressions include MP- and constituency-level controls from Column 4 of Table 4. *Labor incidents* is the number of contentious gatherings in a county, compiled by Horn and Tilly (1986) from news articles and Hansard. *Swing riots* is the number of Swing riots in a constituency from Aidt and Leon-Ablan (2022). Robust standard errors in parenthesis. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

7.2 Industrialists as value types

The alternative to economic interest as a driver of support for abolition is ideology and values. Clearly, the two may be linked, as individuals' and groups' values tend to be congruent with their material interest. This can be either because both normative positions on different issues and individual economic characteristics like occupation or sector of employment are jointly determined by deeper personality traits, or because people adjust their values to correspond to their behavior, as proposed by theories of cognitive dissonance (Festinger 1957; Acharya, Blackwell and Sen 2018). Both mechanisms would imply that industrialists differed in their

[36]The number of Swing riots by constituency is from Aidt and Leon-Ablan (2022).

values, rather than sharing the same underlying preferences as non-industrialists, but differing in the material payoffs to different actions due to their involvement in different economic activities.

While almost impossible to empirically infer preferences from behavior based on historical observational data, in this section we attempt to establish a closer link between anti-slavery activity and industrialists' values and ideology by turning to speeches of MPs in Parliament.

To guide our examination of whether industrialists differed in their values, we rely on Moral Foundations Theory (Haidt 2007; 2012) which posits that human moral concerns can be partitioned into four moral foundations, each emphasizing different principles as guidelines for what is right or wrong. Two of these foundations are "universalist", relying on fairness and equal treatment (*fairness/reciprocity*) or on compassion and care for the weak and vulnerable (*harm/care*) as central moral considerations. Two foundations are "communal", relying instead on commitment to the country or family (*in-group/loyalty*) and respect for authority, order and social traditions (*authority/respect*). Haidt (2007) demonstrates that the relevance of these foundations varies widely by culture and social class. While the exact number of partitions is debated in the psychological literature, the distinction between universalist and communal values is widely accepted (see references cited in Enke 2020, p. 3690).

Even though Moral Foundations Theory has been developed and empirically supported with modern-day data, the application to British MPs in 1833 is not far-fetched. Universalist values readily correspond to progressive and human-centered ideals introduced by the Enlightenment that were not foreign to 19th century British elites. Furthermore, universalist moral foundations intuitively match the moral values behind arguments against slavery identified in news articles of industrial districts.

It is also important to highlight that universalist values do not imply higher altruism or a stronger overall morality. Rather, universalism more closely corresponds to the rate at which altruism declines with social distance (Enke, Rodríguez-Padilla and Zimmermann 2020) or the extent to which one's moral obligations extend equally to everyone (Alexander, Enke and Tungodden 2023). This definition closely matches Quakers' and abolitionists' ideals of equal right to freedom for everyone, including the enslaved. It can be contrasted to other positions on slavery which reflected communal values, such as for instance the argument – expressed by conservatives and some Radicals – that the English people should be given priority over the enslaved in terms of policy focus. That universalism does not equal altruism is also consistent with the fact that many abolitionist manufacturers were willing to tolerate more or less subtle forms of exploitation in the factory system.[37]

To identify universalist values in MP speeches we use the Moral Foundations Dictionary, compiled by Haidt and Graham in 2009 and available online. The dictionary is a list of terms characteristic of each foundation and has recently been used in a political economy application

[37] See Davis (1975, pp.460-461) for a description of the autocratic fashion in which famed abolitionist Josiah Wedgewood ran his Etruria mill.

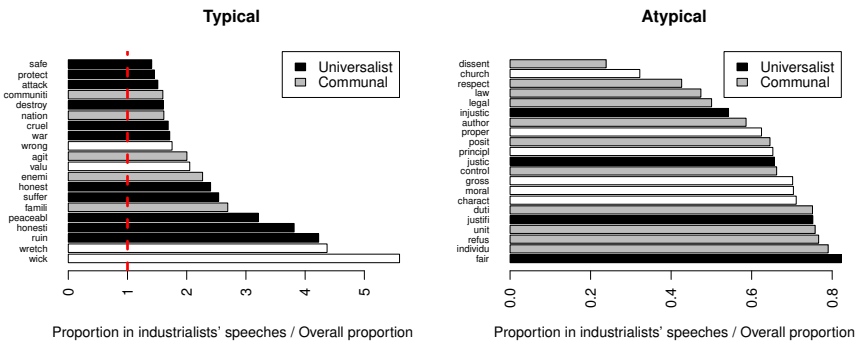
by Enke (2020). We use this resource to examine the extent to which speeches of industrialist MPs revealed a higher prevalence of universalist values.

We begin by computing a measure of distinctiveness of different words in speeches of industrialist MPs.[38] Distinctiveness captures the extent to which a given word is more likely to be found in speeches of one MP type than in MP speeches on average and is computed as follows for industrialists and for each word w:

$$Distinctiveness_w = \frac{Times\ used\ by\ industrialists_w / Total\ words\ in\ industrialist\ speeches}{Times\ used\ by\ MPs_w / Total\ words\ in\ MP\ speeches}$$

Values larger than 1 indicate that a word is more likely to be used by an industrialist than a non-industrialist. Figure 7 displays the 20 words most (left) and least (right) typical of industrialist speeches. It is immediately apparent that speeches characteristic of industrialists are more likely to capture universalist values, while those least frequent – relative to their overall occurrence – in industrialist speeches reflect communal moral foundations.

Figure 7. Words distinctive of industrial MPs



Next, we turn to a more systematic investigation of whether industrialist MPs used universalist moral terms in their speeches and whether this tendency differed by topic. We compute an index of universalism for each MP speech j as:

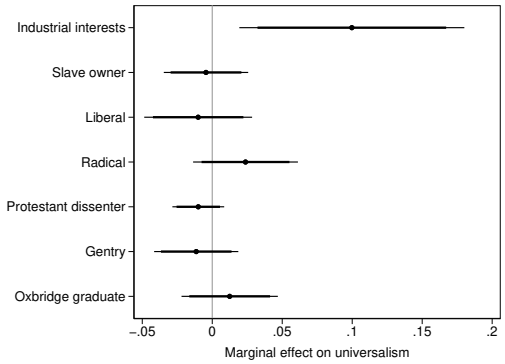
$$Universalism_j = Universalist\ moral\ words_j - Communal\ moral\ words_j$$

Figure 8 displays the results of a regression of this measure on MP characteristics. We normalize all variables such that they have mean 0 and a standard deviation of 1. We cluster standard errors at the MP level. We find that industrialist MPs are significantly more likely to be universalist in their speeches. The only other MP characteristic that is positively correlated with universalism is radical political orientation, but this relationship is not statistically significant. Most notably, neither liberal MPs nor Protestant dissenters are characterized by

[38] We use words appearing in speeches at least 5 times to avoid results driven by rare words.

more universalist words in their speeches. The patterns points to a type of discourse that was characteristic of industrialists, and not confounded with political leanings, religion, or education.

Figure 8. Predictors of universalism in speeches of MPs



Notes: The figure displays coefficient estimates from a regression of the index of universalism on MP characteristics. Standard errors are clustered at the level of the MP. Thick and thin lines represent, respectively, 90 and 95% confidence intervals. Underlying estimates are displayed in Column 1 of Table 9.

Estimates from the regression underlying Figure 8 are reported in column 1 of Table 9. Column 2 includes fixed effects for the topic of each parliamentary debate, as coded by Eggers and Spirling (2014). There are 1,002 distinct debates, which significantly limits power, but the estimate on industrial interests remains positive and larger in magnitude than any other MP characteristic.

One possibility is that the association between industrial interests and universalist discourse is driven by the fact that industrial MPs emphasize different topics in Parliament. Specifically, if industrialists are more likely to participate in debates on slavery, and slavery is a topic that invites more universalist discourse – for instance because of the prevalence of terms related to rights, equality or harm – then it is likely that industrial interests would predict universalism even if those MPs' stance on slavery was not particularly progressive. Columns 3 and 4 in Table 9 show that this is not the case. Industrialists are characterized by more universalist discourse also in debates other than slavery. Other MP characteristics remain uncorrelated with universalism. This supports the interpretation of a stable disposition for industrialists, oriented towards more universalist ideals, and expressed consistently in their public statements, regardless of the issue at hand.

Importantly, the analysis of speeches also demonstrates that universalism is distinct from both general morality and religious values. The Moral Foundations Dictionary contains a separate category for words loaded with moral content, but that do not belong in any of the four foundations of harm, fairness, ingroup loyalty or authority. We compute the relative frequency of such words – for instance, words like "righteous", "moral", "proper" or "correct" – in MPs' speeches and report regressions of this variable on MP characteristics in columns 5 and 6. To account for the fact that we divide with the number of non-stopwords, which may

lead small speeches to have a disproportionate contribution to our estimates, we weigh regressions by the number of non-stopwords. The results show no association between industrial interests and a general emphasis on moral character. Words emphasizing general morality are more prevalent in the speeches of conservative MPs and less prevalent in speeches of MPs with an Oxford or Cambridge education.

In columns 7 and 8 of Table 9, we repeat this exercise using as dependent variable the relative frequency of purity-related words. These words are associated to a fifth moral foundation, that of *sanctity/degradation*. According to Haidt and Graham, this foundation "underlies religious notions of striving to live in an elevated, less carnal, more noble way." The religious association of purity-related words is evident in parliamentary speeches, with dissenters using purity-related words at significantly higher frequencies. However, no significant correlation exists between purity and industrial interests.

Table 9. Universalism by MP characteristics and debate

Dependent variable	Universalism				General morality		Purity	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Industrial interests	0.0997**	0.0727	0.119***	0.101**	0.0157	0.0318	-0.120	-0.0333
	(0.0408)	(0.0479)	(0.0426)	(0.0493)	(0.0437)	(0.0477)	(0.0758)	(0.0718)
Slave owner	-0.00447	-0.0000768	-0.00566	0.00189	0.000840	0.0164*	-0.0252*	0.0101
	(0.0153)	(0.0194)	(0.0145)	(0.0190)	(0.0116)	(0.00954)	(0.0145)	(0.0111)
Liberal	-0.0101	-0.00410	-0.00488	-0.00193	-0.0179*	-0.0345***	0.00606	-0.00749
	(0.0196)	(0.0204)	(0.0192)	(0.0197)	(0.0105)	(0.0116)	(0.0269)	(0.0133)
Radical	0.0238	0.0292	0.0273	0.0296	-0.0118	-0.0149	0.0237	-0.000389
	(0.0190)	(0.0214)	(0.0179)	(0.0202)	(0.0144)	(0.0133)	(0.0223)	(0.0137)
Dissenter	-0.00997	-0.00132	-0.00919	0.000938	-0.00358	-0.00825	0.0561***	0.0292***
	(0.00940)	(0.0123)	(0.00844)	(0.0111)	(0.0111)	(0.0122)	(0.0157)	(0.0111)
Gentry	-0.0114	-0.0177	-0.00435	-0.0117	-0.000322	0.00397	-0.0123	0.0132
	(0.0153)	(0.0170)	(0.0153)	(0.0172)	(0.0117)	(0.0110)	(0.0148)	(0.0102)
Oxbridge	0.0125	0.0234	0.0158	0.0276	-0.0332***	-0.0398***	-0.00856	-0.0270**
	(0.0175)	(0.0167)	(0.0175)	(0.0172)	(0.0103)	(0.0127)	(0.0237)	(0.0128)
Observations	6250	6250	5986	5986	5986	5986	5986	5986
R-squared	0.00150	0.208	0.00158	0.211	0.00422	0.214	0.0155	0.389
Debate FE		✓		✓		✓		✓
Drop slavery debates			✓	✓				

Notes: The table reports standardized beta coefficients from OLS models. The sample consists of speeches delivered in Parliament between 1833 and 1834, from Eggers and Spirling (2014). *Universalism* is an index computed as the difference between universalist (harm, fairness) and communal (ingroup, authority) words in the Moral Foundations Dictionary (MFT). *General morality* and *Purity* are the number of words in the MFT related to, respectively, general morality and purity, divided by the number of non-stopwords. Regressions in columns 5-8 are weighted by the number of non-stopwords in each speech. Robust standard errors, clustered at the MP level, in parenthesis. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

Collectively, the results of Table 9 paint a consistent picture. Industrialists were characterized by distinct universalist ideas and values, not only on the issue of slavery, but also on other topics. This is consistent with evidence from petitioning activity presented in Figure 2. Additionally, universalism should not be confounded either with religious principles, or with an overall emphasis on "morality"; instead, and as existing literature has already made clear (Alexander, Enke and Tungodden 2023), universalist ideology is closely associated with ideas of equality in terms of worth and treatment. This ideology is consistent with support for slave

emancipation, and underlied industrialist MPs' voting behavior in Parliament on the issue of abolition.

8 Discussion and conclusion

In this study, we have examined the connection between structural transformation and value change in the context of one of modernity's largest campaigns for social change, the abolitionist movement in late 18th and early 19th century Britain. We have found a robust correlation between industrialization and anti-slavery petitioning campaigns at the local level, as well as between industrial interests and anti-slavery voting at the individual MP level. Free-trade ideology, economic reliance on raw material from the colonies, constituency pressures and strategic motives to deflect social grievances cannot explain industrialist MPs' anti-slavery stance. Text analysis of newspaper articles on slavery and of MPs' speeches in Parliament reveals a distinct ideology connected to industrial interests, reflective of liberal humanist Enlightenment ideals, and a universalist morality. Taken together, our analysis is consistent with a view of industrialists as distinct ideological and value types, whose values rose to prominence through the process of England's structural transformation and altered the moral status quo.

Our results help resolve some ambiguities in the voluminous historical literature on British abolition. While we do not explicitly test the argument of Eric Williams (1944) that the slave trade and slavery were abandoned when they stopped being profitable to Britain, we show that the social groups that supported abolition were not necessarily driven by narrow economic concerns, but that they acted according to values and ideas characteristic to them and distinct from those of other social classes. Our findings are most supportive of the arguments in Davis (1966), who saw abolition as a change mainly instigated by industrialists and legitimizing of a new world order in which industrialists were rising to elite status. It is possible – in fact, the large volume of anti-slavery petitions suggests that it is likely – that other social classes joined in the abolitionist fervor. Our findings thus do not refute the argument of Drescher (1986) that middling social strata opposed slavery. It is possible that they did so, and that they were driven to that end by a reaction against the rise of capitalism. But our results cast doubt on abolitionism being a social movement exclusively led by the middle classes, as they suggest an unambiguous link between anti-slavery activism and industrial elites, largely supported by a distinct industrialist ideology.

Several questions are left open. A central part of the argument in Davis (1966) is that abolitionism was embraced by industrialists because it contributed to the legitimization of the capitalist system of labor relations, reliant on free wage labor. We have not directly examined the extent to which anti-slavery discourse was accompanied by explicit arguments in favor of capitalist labor relations. The analysis of news articles does not reveal topics that explicitly contrast slavery to a different labor system, and slavery-related articles in industrial districts are not more likely to be economic in focus. Yet the argument is subtle, as attacks on the institution of slavery may have had the effect of legitimizing free labor even if the connection

between the two systems was not explicitly made.

By focusing on the role of elite turnover in bringing about moral change, we abstract from other ways in which structural transformation can lead to changes in a society's values. One question in the case of the British abolitionist movement concerns the stance of the working class, and the extent to which its position in the new industrial British economy made it more or less supportive of an anti-slavery ideology. Radicals like William Cobbett challenged the abolitionists by continuously drawing attention to the plight of England's poor. In November 1822, during a particularly rainy week, Cobbett's entry in his documentation of his journeys on horseback across England stated "I pity none but the poor English creatures, who are compelled to work on the wool of this accursed week, which has done so much mischief to England. The slaves who cultivate and gather the cotton, are well fed. They do not suffer." (Cobbett 1830). At the same time, Radicals generally supported abolition and the cause had mass appeal among lower social strata. Scholars like Appiah (2011) hypothesize that opposition to slavery was a means for English working class members to reclaim a sense of honor, by elevating the status of laborers in the West Indies whose conditions of life were not much different to their own.

The working class's positions on slavery can also help us understand the process through which elite values come to dominate a society and the extent to which they are challenged or not by other social strata. Davis (1975) speaks of a process of "ideological hegemony," whereby elite language and ideas come to be adopted even by social classes that challenge them and demand reform. In his own words "Wage labor under present conditions leads to even worse misery than chattel slavery; because you responded to moral arguments in abolishing the slave trade ... you should now relieve the distress of England's working poor. ... this reinforcement of ruling-class standards is precisely what is meant by 'ideological hegemony' " (Davis 1987 in Ashworth et al. (1992)). One of the topics most characteristic of articles on slavery in industrial districts is one we label "Factory work" and which is centered around industrial labor. Consistent with David's ideological hegemony thesis, factory work was discussed using abolitionist terminology, with parallels made between working children and slaves and arguments employed to improve factory conditions resembling those used to promote abolition (Figure B.7).

The diffusion of elite ideology and moral values to the rest of the population, even when those values are used to oppose the elites – precisely because opposition to the elites can only effectively take place in their own moral terms – is an understudied process. This process is complementary to the better studied pathway of status-based transmission, whereby lower social strata adopt elite values as their own.[39] A better understanding of both channels can paint a fuller picture of how structural transformation leads to social change, and is a fruitful avenue for future research.

[39]This status-based channel is also discussed by Davis (1966) as a driver of the anti-slavery stance of middling but rising social strata, such as skilled laborers.

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A Data Appendix

Table A.1. Description of variables and sources

Variable name	Definition and source
Petitions to Parliament	Number of petitions on different topics (abolition, parliamentary reform, Catholic rights) sent from district or parish j in year t. This variable was created using the indices of various editions of the Journal of the House of Commons (1788-1833). The town of each petition was automatically geocoded using the OpenStreetMaps routine in R, and petitions were assigned to census registration districts or parishes using the longitude and latitude of their towns of origin.
Coal area	Proportion of district or parish j's area that overlaps with coal-bearing bedrock. For this, we used shapefiles from the *British Geological Survey*.
Coal distance	Distance from the centroid of district or parish j to the nearest coal deposit. For this, we used shapefiles from the *British Geological Survey*.
Share manufacture	Share of district or parish j's male population in 1831 employed in manufacture. We relied on the 1831 English Census, generously provided to us by the Cambridge Group for the History of Population and Social Structure.
Coal consumption	Total coal consumption in England in year t in exajoules, according to Warde (2007).
Distance to London	Distance (as the crow flies) from the centroid of district, parish or constituency j to London (in km).
Distance to coastline	Distance (as the crow flies) from the centroid of district, parish or constituency j to the nearest point on the coastline.
Distance to port	Distance (as the crow flies) from the centroid of district, parish or constituency j to the nearest port. For this, we used data on the location of ports from Alvarez-Palau and Dunn (2019).
Distance to navigable river	Distance (as the crow flies) from the centroid of district, parish or constituency j to the nearest navigable waterway. For this, we used data on navigable rivers from Satchell, Shaw-Taylor and Wigley (2017).
Ruggedness	Ruggedness of the terrain in district, parish or constituency j. For details, see Nunn and Puga (2012). Elevation data is from the Food and Agriculture Organization (FAO).

Variable	Definition and source
Average elevation	Average elevation of the terrain in district, parish or constituency j. Data from FAO.
Slope	Average uphill slope of district, parish or constituency j's surface area. Data from FAO.
Suitability for wheat production	Index of suitability for wheat production (rainfed, low input) according to the FAO.
Log Quaker meeting houses	Log number of Quaker meeting houses in district, parish or constituency j in year t. We geocoded information on the location of Quaker meeting houses each year from Butler (1999).
Log number of gentry	Log number of members of the gentry alive in year t associated with a location within the boundaries of district, parish or constituency j. For this, we relied on a large georeferenced genealogy compiled by Cummins (2017).
Anti-slavery vote	Dummy variable indicating that MP voted at least once with the anti-slavery party in a division on the Slavery Abolition Act of 1833. In the Emancipation Act of 1833, most positions on amendments were not recorded. It is possible to identify MPs who voted for minimal monetary or labor compensation to planters. In other words, to limit the period of apprenticeship or reduce monetary compensation to planters. We constructed this variable using the list of divisions provided in Hansard [XIII, XIV, XVIII, XIX, and XX] (available online here: https://api.parliament.uk/historic-hansard/volumes/3/index.html). We take this definition of anti-slavery attitudes from Gross (1980) and Franzmann (1994).
Political leaning	Dummy variable indicating the political leaning of MP i according to the Stenton (1976) biographical dictionary. Political leanings include Conservative, Liberal, and Radical.
Industrial interests	Dummy variable indicating that MP has industrial interests according to the Stenton (1976) biographical dictionary. MPs with industrial interests are those who are manufacturers or sons of manufacturers (e.g., steel, brewers, textiles etc).
Slave owner	Dummy variable indicating that MP owned slaves in 1833 according to the database of the *Centre for the Study of the Legacies of British Slavery*

Variable	Definition and source
Oxbridge	Dummy variable indicating that the MP attended Oxford University or Cambridge University, according to the Stenton (1976) biographical dictionary and Wikipedia biographies.
Free trade	Dummy variable indicating that MP supports free trade according to the Stenton (1976) biographical dictionaries.
Corn laws	Dummy variable indicating that MP supports the Corn Laws according to the Stenton (1976) biographical dictionaries.
Textile manufacturer	Dummy variable indicating that MP is owner of a textile mill according to the Stenton (1976) biographical dictionaries.
Ran unopposed	Dummy variable indicating that MP ran unopposed in 1832 election, from Eggers and Spirling (2014).
Protestant dissenter	Dummy variable indicating that MP was a religious dissenter, from Salter (1953) and Bebbington (2009).
Gentry MP	Dummy variable indicating that the MP was from the gentry.
Pledged to abolish	Dummy variable indicating that MP pledged to abolish slavery in the anti-slavery journal *The Tourist*.
Log population in 1832	In the cross-section of parliamentary constituencies, the population of constituency j according to Dod (1832).
Index of market integration	Sum of the distances from the centroid of district i (constituency, parish, CRD) to each one of the other districts, weighted by the population of each district.
Distance to nearest city	Distance from the centroid of constituency i to the nearest city of over 20,000 persons in 1800 per Bosker, Buringh and Van Zanden (2013).
Labor incidents 1828-1832	Number of contentious gatherings between 1828 and 1833 in which the major issue was either wage demands or issues concerning labor organizations. County-level data from Horn and Tilly (1986), coded from newspapers and Hansard.
Swing riots	Number of swing riots in constituency i according to Aidt and Leon-Ablan (2021).

Table A.2. Summary statistics, district and parish-level data

Variable	Mean	Std	Min	Max	N
Census registration district (CRD)					
Share of area on coal-bearing bedrock	0.069	0.194	0	1	624
Distance from centroid to nearest coal	70.311	65.619	0.010	238.523	622
Share in manufacturing	0.058	0.121	0	0.668	624
Distance to port	20.579	16.157	0.276	70.966	624
Distance to London	175.941	110.897	0.592	484.155	624
Distance to river	6.820	7.640	0.035	68.946	624
Distance to coastline	37.761	29.271	0.346	116.495	624
Distance to urban center	48.533	41.401	0.144	319.555	624
Ruggedness	36.823	25.650	0.625	155.875	624
Elevation	95.715	80.177	0	520.200	624
Slope	8555.758	988.024	4331.000	9987.714	624
Wheat suitability	3153.417	1512.759	0	7323.500	624
Market integration index	8.595	2.035	6.229	18.357	624
Latitude	52.270	1.167	49.892	55.679	624
Slave owners	1.615	5.985	0	98	624
CRD panel					
Petitions for abolition	1.388	3.437	0	42	8736
Petitions for Catholic rights	0.370	1.504	0	36	8736
Petitions for parliamentary reform	0.173	0.898	0	31	8736
Number of gentry	7.139	11.969	0	156	8736
Number of Quaker houses	0.720	0.964	0	7	8736
Parish					
Share of area on coal-bearing bedrock	0.060	0.221	0	1	13816
Distance from centroid to nearest coal	63.368	62.118	0	243.887	13816
Share in manufacturing	0.031	0.105	0	0.943	13801
Distance to port	22.306	16.376	0.079	73.104	13816
Distance to London	192.268	106.683	0.094	492.299	13816
Distance to river	7.467	7.140	0	71.757	13816
Distance to coastline	38.833	29.637	0.038	119.154	13816
Distance to urban center	47.984	33.831	0.087	319.555	13816
Ruggedness	32.887	24.647	0.375	226.030	13816
Elevation	31.240	644.473	0	566.495	13816
Slope	8736.049	907.229	2732	9992	13816
Wheat suitability	3530.938	1429.815	0	7615	13816
Market integration index	17641.838	4098.609	12530.205	41947.055	13816
Latitude	52.563	1.243	49.892	55.783	13816
Slave owners	0.049	0.491	0	24	13816
Parish panel					
Petitions for abolition	0.055	0.312	0	12	193424
Petitions for Catholic rights	0.014	0.178	0	25	193424
Petitions for parliamentary reform	0.006	0.124	0	14	193424
Number of gentry	0.272	1.751	0	112	193424
Number of Quaker houses	0.030	0.172	0	2	193424
Time series variables					
Coal consumption	638.671	163.052	275	785.2	14
Hurricanes	2.429	1.342	0	4	14
Sugar production (hundred tons)	176.267	46.046	58.7	211.418	14

Table A.3. Summary statistics, MP and constituency-level data

Variable	Mean	Std	Min	Max	N
Constituency					
Distance to port	0.359	0.552	0.002	5.019	332
Log distance to London	2.545	1.779	0.020	9.813	332
Distance to river	0.243	0.576	0.000	5.054	332
Distance to coast	0.337	0.314	0.000	2.072	332
Distance to urban center	0.546	0.488	0.002	3.534	332
Ruggedness	44.721	28.668	0.682	139.920	310
Elevation	1.006	0.830	0	4.325	332
Slope	82.371	11.448	46.456	99.720	328
Wheat suitability	30.948	14.514	0.000	72.969	328
Market integration index	0.069	0.028	0.044	0.227	332
Latitude	0.529	0.019	0.501	0.603	332
Log population	10.205	1.348	7.819	14.122	332
Population density	0.006	0.065	0	1.134	332
Quaker meeting houses	1.687	3.480	0	40	332
Number of gentry	17.120	32.305	0	261	332
Textile mills	1.458	7.409	0	89	332
Petitions overall	39.880	66.168	0	729	332
Petitions 1833	13.283	23.409	0	229	332
MP ran unopposed	0.309	0.460	0	1	332
Labor incidents 1828-1833	4.340	7.353	0	29	332
Labor incidents 1833	0.675	1.905	0	7	332
Swing riots	6.401	21.070	0	167	332
MP characteristics					
Pro-abolition (roll-call)	0.371	0.483	0	1	561
Industrial interests	0.045	0.208	0	1	555
West Indies interests	0.032	0.177	0	1	555
Liberal	0.478	0.500	0	1	502
Radical	0.267	0.443	0	1	502
Protestant dissenter	0.023	0.151	0	1	561
Free trade	0.086	0.280	0	1	561
Corn laws	0.139	0.346	0	1	561
Textile manufacturer	0.009	0.095	0	1	555
Ran unopposed	0.285	0.452	0	1	561
Pledged to abolish (The Tourist)	0.232	0.422	0	1	561

B Additional Figures and Tables

Figure B.1. Anti-slavery petitions and mentions of slavery in news articles

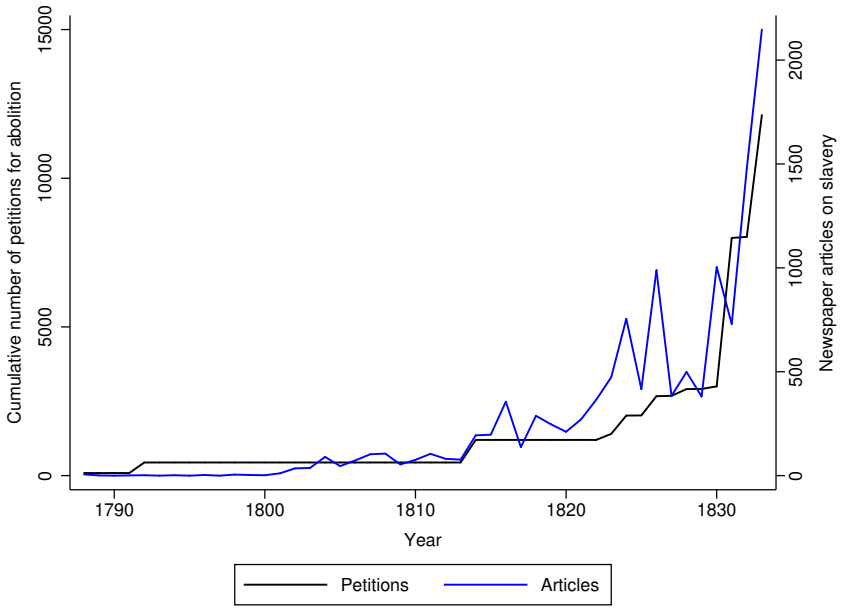
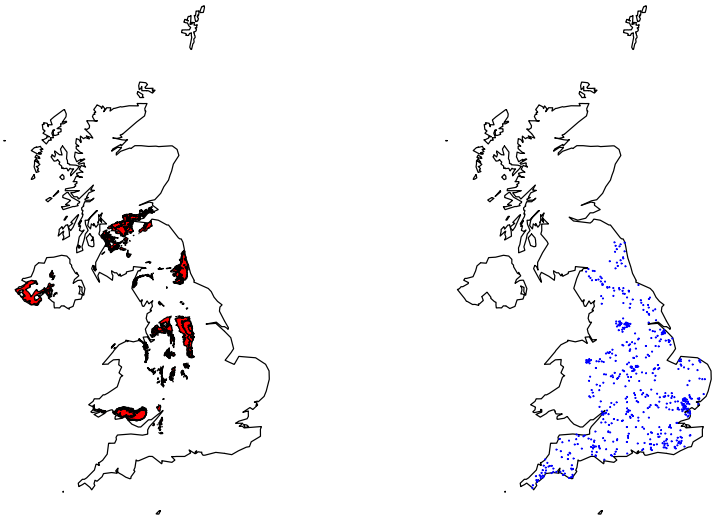
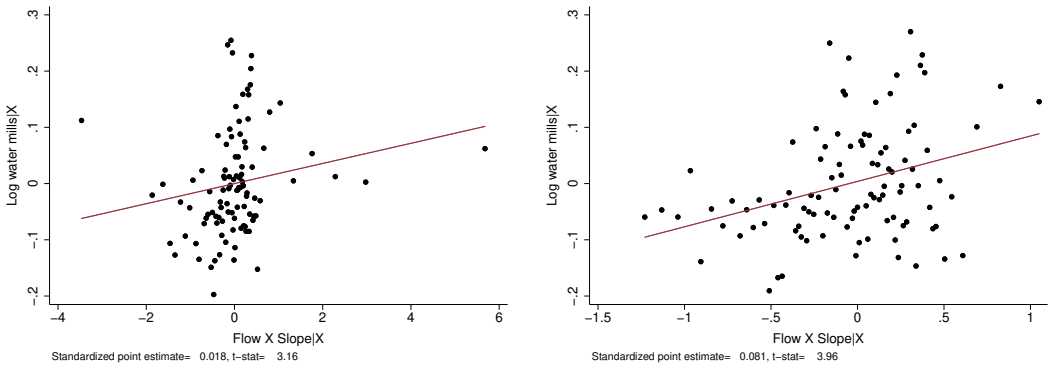


Figure B.2. Coal-bearing bedrock and fifteenth century water mills



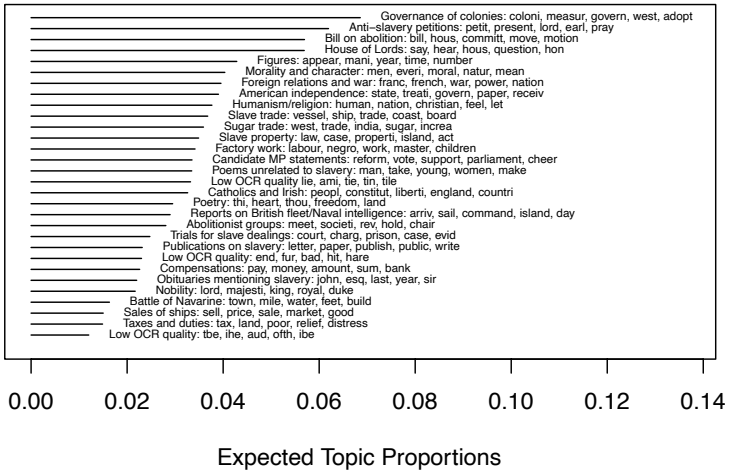
Notes: Data from the *British Geological Survey* (left) and Heldring, Robinson and Vollmer (2021) (right).

Figure B.3. First stage



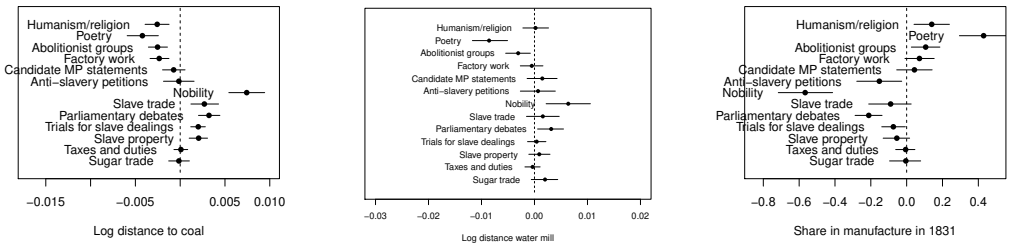
Notes: The figure displays binned scatterplots of residualized values of *Log water mills* and *Flow×Slope* after controlling for terrain slope, mean river flow from the five gauging stations nearest to a parish centroid and all controls from column 5 of Table 3. The figure on the right restricts the data by dropping parishes with values of *Flow×Slope* below the 5th or above the 95th percentile.

Figure B.4. Topics of articles on slavery



Notes: Expected topic proportions for a model with 30 topics estimated following Roberts et al. (2014).

Figure B.5. Topics of articles on slavery, alternative measures of industrialization



Notes: The figures display the estimated difference in the prevalence of different topics across parishes by log distance to nearest coal bedrock (left), log distance to nearest fifteenth century water mill (middle) and share of male employment in manufacturing in 1831 (right).

Figure B.6. Document of 1806 Manchester anti-slavery petition

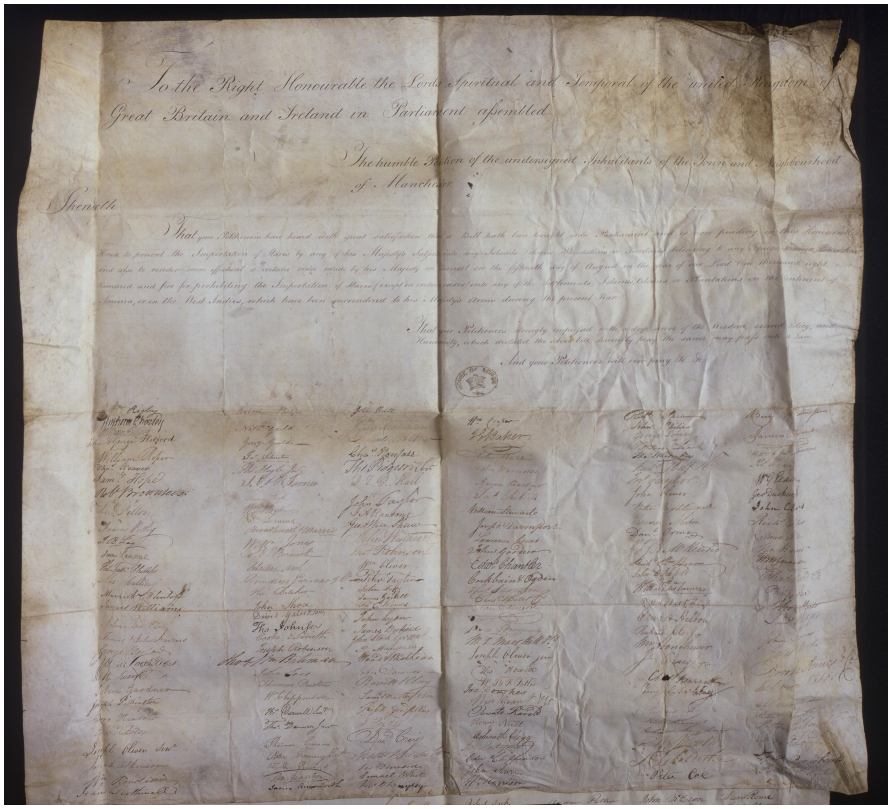


Figure B.7. Words associated with topic "factory work"



Notes: The figure displays words with size reflecting probability weights conditional on words coming from the topic labelled *Factory work*. The topic results from a Structural Topics Model with 30 topics estimated following Roberts et al. (2014).

Table B.1. Coal, water mills and industrial employment

Dependent variable	Share in manufacturing in 1831					
	(1)	(2)	(3)	(4)	(5)	(6)
Coal area	0.138***	0.0837***				
	(0.00794)	(0.00759)				
Log distance to London		0.0251***		0.0147***		0.0301***
		(0.00126)		(0.00171)		(0.00131)
Log distance to river		-0.0118***		-0.00987***		-0.0129***
		(0.000846)		(0.000792)		(0.000872)
Log distance to coast		0.00582***		0.00413***		0.00772***
		(0.000778)		(0.000827)		(0.000805)
Log distance to urban center		-0.0219***		-0.0184***		-0.0285***
		(0.00144)		(0.00165)		(0.00142)
Latitude		-0.00995***		-0.00530***		-0.00775***
		(0.000921)		(0.000846)		(0.000905)
Ruggedness		0.000732***		0.000431***		0.000708***
		(0.0000585)		(0.0000506)		(0.0000611)
Elevation		0.0000972***		0.0000963***		0.0000898***
		(0.0000269)		(0.0000257)		(0.0000274)
Slope		-0.00000173		-0.000000431		-0.00000472**
		(0.00000180)		(0.00000169)		(0.00000185)
Wheat suitability		-0.00000571***		-0.00000271***		-0.00000645***
		(0.000000567)		(0.000000542)		(0.000000587)
Market integration index		-0.00000365***		-0.00000140***		-0.00000340***
		(0.000000286)		(0.000000273)		(0.000000281)
Log distance coal			-0.0182***	-0.00840***		
			(0.000898)	(0.00120)		
Log water mills					0.0137**	0.0214***
					(0.00656)	(0.00592)
Observations	13801	13801	12983	12983	13801	13801
R-squared	0.0845	0.204	0.0870	0.137	0.000380	0.179
Mean dep. variable	0.0313	0.0313	0.0241	0.0241	0.0313	0.0313

Notes: Robust standard errors in parenthesis. Standardized beta coefficients reported. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

Table B.2. Industrialization and support for abolition, robustness I

Dependent variable	Log number of petitions			IHS petitions		
	(1)	(2)	(3)	(4)	(5)	(6)
Coal area×Coal consumption	0.0878***			0.114***		
	(0.0126)			(0.0163)		
Log distance coal×Coal consumption		-0.00542**			-0.00715**	
		(0.00238)			(0.00308)	
IHS distance coal×Coal consumption			-0.00669***			-0.00877***
			(0.00213)			(0.00275)
Observations	193424	193424	193424	193424	193424	193424
R-squared	0.310	0.309	0.309	0.309	0.309	0.309
Mean dep. variable	0.0331	0.0331	0.0331	0.0425	0.0425	0.0425

Notes: IHS Petitions is the inverse hyperbolic sine transformation of the number of petitions. All columns include controls from column 2 of Table 2 interacted with year fixed effects. Robust standard errors, clustered at the parish level, in parenthesis. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

Table B.3. Industrialization and support for abolition, robustness II

Dependent variable	Log number of petitions				IHS petitions			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log water mills×Industrial output	0.00584***				0.00761***			
	(0.00127)				(0.00164)			
IHS water mills×Industrial output		0.00452***				0.00590***		
		(0.000985)				(0.00128)		
Log distance water mills×Industrial output			0.00584***				0.00761***	
			(0.00127)				(0.00164)	
IHS distance water mills×Industrial output				0.00452***				0.00590***
				(0.000985)				(0.00128)
Observations	193424	193424	193424	193424	193424	193424	193424	193424
R-squared	0.310	0.310	0.310	0.310	0.309	0.309	0.309	0.309
Mean dep. variable	0.0331	0.0331	0.0331	0.0331	0.0425	0.0425	0.0425	

Notes: IHS Petitions is the inverse hyperbolic sine transformation of the number of petitions. All columns include controls from column 2 of Table 2 interacted with year fixed effects. Robust standard errors, clustered at the parish level, in parenthesis. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

Table B.4. Industrialization and support for abolition, cross-sectional IV results

Dependent variable	Log number of petitions		Log water mills	Log number of petitions	
	OLS	Reduced form	First stage	2SLS	
	(1)	(2)	(3)	(4)	(5)
Log water mills	0.274***			16.66***	11.33***
	(0.0406)			(5.392)	(3.941)
Flow	-0.00189***	-0.00615***	-0.00108***	0.0118**	0.00475
	(0.000649)	(0.000715)	(0.000161)	(0.00489)	(0.00297)
Slope	-0.0000242***	-0.0000338***	-0.00000883***	0.000113**	0.0000503
	(0.00000564)	(0.00000570)	(0.00000164)	(0.0000497)	(0.0000515)
Flow×Slope		0.00000131***	7.87e-08***		
		(0.000000150)	(2.46e-08)		
Observations	13816	13816	13816	13816	13816
R-squared	0.00734	0.00907	0.00440		
KP F-statistic				10.23	9.98
Controls					✓

Notes: Robust standard errors, clustered at the parish level, in parenthesis. Conley standard errors using a distance cutoff of 100 km reported in brackets. Controls include ruggedness, elevation, slope, latitude, wheat suitability, log distance to London, log distance to nearest port, log distance to the coastline, log distance to nearest navigable river, log distance to nearest urban center and index of market integration. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

Table B.5. Industrialization and other petitioning campaigns

Dependent variable	Log number of petitions			
	Abolition	Parliamentary reform	Catholic rights	All others
	(1)	(2)	(3)	(4)
	Panel A: Coal			
Coal area×Coal consumption	0.0878***	0.0143***	0.00717*	0.0194**
	(0.0126)	(0.00503)	(0.00404)	(0.00887)
Observations	193424	193424	193424	193424
R-squared	0.310	0.138	0.184	0.220
Mean dep. variable	0.0331	0.00359	0.00856	0.0135
	Panel B: Water mills			
Log water mills×Industrial output	0.00584***	0.00165***	0.000935***	0.00299***
	(0.00127)	(0.000457)	(0.000318)	(0.000778)
Observations	193424	193424	193424	193424
R-squared	0.310	0.138	0.184	0.220
Mean dep. variable	0.0331	0.00359	0.00856	0.0135
	Panel C: 2SLS			
Log water mills×Industrial output	0.194**	0.0326	0.0349*	0.0893*
	(0.0806)	(0.0229)	(0.0210)	(0.0488)
Observations	193424	193424	193424	193424
R-squared	-0.255	-0.0444	-0.0266	-0.112
KP F-statistic	9.619	9.619	9.619	9.619
Mean dep. variable	0.0331	0.00359	0.00856	0.0135

Notes: All regressions control for parish and year fixed effects, as well as time-invariant controls interacted with year fixed effects. Robust standard errors, clustered at the parish level, in parenthesis. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

Table B.6. Newspaper political orientation and industrial activity

Dep. Variable	Conservative				
	(1)	(2)	(3)	(4)	(5)
Coal area	-0.166				
	(0.106)				
Has coal		0.227			
		(0.146)			
Log water mills			-0.068		
			(0.117)		
Has water mill				-0.084	
				(0.117)	
Share manufacture					3.964
					(2.818)
Observations	73	73	73	73	73
R-squared	0.007	0.041	0.007	0.006	0.033

Notes: The dataset consists of newspapers that published articles mentioning slavery between 1787 and 1833 and whose political orientation could be identified. *Share manufacture* is the share of male employment in manufacturing in 1833. Robust standard errors clustered at the CRD level in parenthesis. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.

Table B.7. Signature sequence in the Manchester petition by occupation

Dep. variable	Page number	Column number (within-page)	Entry number (within-column)	Entry number (within-page)
	(1)	(2)	(3)	(4)
Industrialist	-2.442***	-0.954***	-6.093***	-75.06***
	(0.447)	(0.266)	(1.999)	(10.85)
Textile worker	-0.951***	-0.230	0.120	-12.06
	(0.368)	(0.293)	(2.483)	(15.71)
Merchant	-3.223***	-0.474	-9.356***	-62.81***
	(0.565)	(0.355)	(2.452)	(13.54)
Dealer	-2.421***	-1.064***	-10.75***	-74.92***
	(0.503)	(0.410)	(2.327)	(14.81)
Warehouseman	0.0866	0.375	-3.647	-9.505
	(0.665)	(0.538)	(2.721)	(25.75)
Tailor	0.463	-1.801***	-0.651	-85.98***
	(0.630)	(0.344)	(4.215)	(16.69)
Joiner	0.930	-0.885**	-3.118	-41.86**
	(0.597)	(0.420)	(3.852)	(18.85)
Shopkeeper	0.180	-0.551	-0.785	-23.86
	(0.685)	(0.519)	(4.151)	(29.91)
Shoemaker	0.563	0.299	10.28**	11.25
	(0.711)	(0.658)	(4.988)	(23.98)
Attorney	-2.070*	1.032	-7.785*	10.22
	(1.151)	(0.645)	(3.986)	(34.96)
Other	-0.439	-0.111	-3.832**	-15.61
	(0.274)	(0.231)	(1.648)	(11.81)
Observations	2348	2348	2348	2348
R-squared	0.0535	0.0128	0.0168	0.0216
Mean dep. variable	5.613	3.750	23.66	153.2

Notes: The table displays OLS estimates from regressions of various measures of signature order on signatory occupation. The sample consists of individuals who signed the 1806 Manchester petition. The base category is individuals of unknown occupation who could not be linked to contemporaneous trade directories. Robust standard errors in parentheses. Significance levels: *** p< 0.01, ** p< 0.05, * p< 0.1.