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Article

Professionals and populists: the making of a free market for medicine in the United States, 1787–1860

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Abstract

In the early decades of the 19th century, physicians in the USA enjoyed unquestioned authority in medicine and increasing state recognition. But by mid-century, their monopoly had given way to a raucous free market for medical care. To explain the causes and consequences of this dismantling of a professional monopoly, we draw on political sociology. We argue that to maintain a monopoly, a dominant profession must defend its cultural authority against rival claims and preserve its institutional support from the state. A dominant profession can lose its monopoly if rival occupations mobilize to challenge its cultural authority and if populist political coalitions mobilize to repeal laws upholding professional monopolies. Our analysis, which covers all states in the Union by 1860, reveals that the dynamics of contention, both within the system of professions and in the wider political arena, can erode the foundations of professional monopolies.

Key words: professions, social movements, political parties, historical sociology

JEL classification: Z13, Z18, L84, N31

1. Introduction

Professions have monopolies on the services they offer. But no profession can secure a monopoly on its own. All professions need clients, governments and other occupations to ratify their claims to an area of work (Larson, 1977, pp. 67–79; Starr, 1982, pp. 13–17; Freidson, 1986, pp. 59–88; Abbott, 1988, pp. 134–142, 2005). Whether with enthusiastic support or resigned acceptance, clients must trust in professions to evaluate their own members, governments must uphold their legal protections from open competition and other occupations

must defer to their competence in their area of work. Without cooperative allies, little would remain to distinguish professions from any other service occupation.

It follows, therefore, that the same actors can breach this compact and undermine the foundations of professional power. Rival occupations and state officials are especially well-placed to challenge professions. Prior studies have generally focused on how clients and managers can prevent professions from using their monopolies to extract social and economic rewards (Starr, 1982; Krause, 1996; Scott *et al.*, 2001). But while conflicts over remuneration are of great significance to individual professionals, they rarely impinge on the more fundamental aspects of professional power, such as the cultural authority granted to professional knowledge or the legal privileges professions enjoy. In contrast, a rival occupation with an independent source of cultural authority can call into question the legitimacy of a professional monopoly (Abbott, 1988; Berman, 2006). And state officials have it in their power to deprive a profession of its monopoly protections under law (Abbott, 2005). Indeed, opposition to professional monopolies can act as a 'hinge' issue that rewards rival occupations and state officials for making common cause with one another (Abbott, 2005).

To explain how challenges to a professional monopoly emerge and succeed, we draw on insights from political sociology. In doing so, we contribute to a growing literature that reframes professions as fields of contestation (Dezalay and Garth, 2002; Berman, 2006; Medvetz, 2012; Liu and Emirbayer, 2016). Like other markets, professional markets are typically dominated by coalitions of incumbents, which here include not only a dominant profession—for example, physicians—but also the subordinate occupations—nurses, pharmacists, technicians—which gain access to the market by deferring to the authority of the dominant profession (Fligstein and McAdam, 2012). For incumbents, the main goal of action in the market is to defend their position and convince others to do the same. For their opponents, therefore, the main goal of action must be to weaken the bonds that link the dominant profession to its allies and open the market to new competitors.

Challengers can arise within the system of professions or within the wider political arena. Within the system of professions, the most likely challengers are other occupations that lay claim to the same work as the dominant profession based on a different source of cultural authority. In opposing a dominant profession, challenger occupations face a collective action problem akin to those faced by social movements. Like social movements, challenger occupations face a powerful opponent in the dominant profession, one which has the support of state authorities, greater organizational strength and few, if any, reasons to offer concessions (Gamson, 1975; Tarrow, 1998; Fligstein and McAdam, 2012). Challenger occupational groups must therefore mobilize their supporters to bolster their own cultural authority over and against the cultural authority of the dominant profession (Frickel and Gross, 2005; Berman, 2006).

In the political arena, broader movements may arise that seek to curtail the power of dominant professions. Anti-professional movements are more likely to succeed as part of coalitions that can pressure officials and elect sympathetic candidates (Bourdieu, 1991; Fligstein and McAdam, 2012). Populist parties are an important example of such coalitions. Populists stand against a privileged establishment in the name of the common people (although 'the people' is often narrowly defined).[1] Populist politicians therefore target all

1 The meaning of 'populism' is contested. We do not enter debates about what kinds of political beliefs should be labelled populist (e.g. Ingelhart and Norris, 2016; Müller, 2016; Mudde and

manner of exclusive privileges, including professional power (Larson, 1977, pp. 113–135; Starr, 1982, pp. 40–59; Burrage, 2006). Once in government, populist politicians are able to pursue legislation depriving professions of monopoly protections.

In this article, we examine a prominent example of the decline of a professional monopoly, namely medicine in the USA in the early 19th century. By 1825, American physicians enjoyed unquestioned authority in medicine as well as monopoly privileges in nearly two-thirds of all states. But over the next 25 years, state officials opened up the practice medicine to anyone who professed expertise in the healing arts, even as European nations imposed rigorous training standards for doctors and strict penalties for unlicensed medical practice (Newman, 1957; Rothstein, 1972; Starr, 1982; Steffen, 1987; McClelland, 1991). Although marginalized in Europe, a diverse assortment of alternative healers flourished in the USA, including Thomsonians, homeopaths, eclectic doctors, physio-medicalists and hydropaths (Weiss and Kemble, 1967; Haller, 1994, 2000, 2005). 'Thus', in the trenchant assessment of one historian of medicine, 'did Jacksonian Democrats proclaim their inalienable rights to life, liberty and quackery' (Shryock, 1947, p. 262).

To test our arguments, we gathered data on the determinants of professional power for both incumbent and challenger medical occupations as well as the mobilization efforts of medical occupations and populist parties. The data cover the period from 1787, the year of the Constitutional Convention, to 1860, a year before the outbreak of the Civil War. While previous studies have focused either on a single state (Abbott, 2005; Whooley, 2013) or on broad national trends (Shryock, 1947; Larson, 1977; Starr, 1982), our analysis evaluates changes in professional power across every state admitted to the Union before 1860, plus the District of Columbia, allowing us to assess the importance of different causal pathways across the full range of outcomes in the USA.

2. The politics of professions

Professional power, simply put, is the ability of a profession to secure clients despite the efforts of competitors (Larson, 1977, pp. 67–79; Starr, 1982, pp. 13–17; Freidson, 1986, pp. 59–88; Abbott, 1988, pp. 143–211). Here, we consider two key determinants of professional power, cultural authority and institutional protection.[2] We then use literature from political sociology to develop intuitions about two sources of opposition to professional power—one arising from rival occupations and the other from political movements—and their consequences for professions' control over markets for their own services.

Cultural authority derives from training and certification processes through which professions attempt to present their members as worthy of clients' trust. Professions lay claim to their work based on a system of specialized knowledge that defines the appropriate

Kaltwasser, 2017). Instead, we follow Laclau (2005) and employ a minimal definition of populism based on the form of populist rhetoric—appeals to popular sovereignty against entrenched privilege—rather than its ideological content.

2 The distinction between these two dimensions is common in the literature on professions although there is little agreement on terminology: scholars contrast cultural authority and social authority (Starr, 1982, pp. 13–17), intellectual and institutional capital (Bourdieu, 1988, pp. 38–62), autonomous and heteronomous means of securing professional authority (Larson, 1977, pp. 67–79), and the cultural dominance of a profession and the social structure of its settlement with state authorities (Abbott, 1988, 143–211).

categories of diagnosis, rules of inference and methods of practice (Larson, 1977, pp. 40–52; Freidson, 1986, pp. 59–60; Abbott, 1988, pp. 52–57, 98–102). To ensure the transmission of that knowledge to new practitioners, professions establish training organizations, of which professional schools are the oldest and most common form. For most professions, professional schools are foundational to the claim of cultural authority: they not only train and credential new members of the profession, but also support research to expand and improve the profession's system of knowledge.

Institutional protection inheres in the symbolic and coercive power of the state or other powerful actors to defend a professional monopoly. States grant institutional protection in the form of regulations that restrict the sale of professional services (Larson, 1977, 24–25; Freidson, 1986, pp. 63–88; Timmermans, 2008). Such regulations empower professions by preventing rival occupations from accessing their markets. Licensing regulations are perhaps the most common example of institutional protection. Licensing laws establish examinations based on a system of professional knowledge, such as bar exams for lawyers or board exams for doctors, and set penalties for those who practice without a license. Through licensing laws, states both valorize the knowledge possessed by professions and prevent other occupations from entering their markets.

Just as cultural authority and institutional protection serve to maintain professional monopolies, so too may they provoke opposition from those who do not share in their benefits. Below, we explain how challenger occupations and populist parties can mobilize against each of these determinants of professional power.

2.1 Challenger occupations

The most significant opposition to any profession's cultural authority comes from other occupations. Indeed, struggles with other occupations are central facts of professional life (Abbott, 1988). Just as a dominant profession uses its knowledge to claim cultural authority, so too can rival occupations develop alternative systems of knowledge to challenge a dominant profession and establish their own cultural authority. Whether challenger occupations succeed depends in large part on their ability to set up training and credentialing organizations to bolster their cultural authority. In this respect, challenger occupations may follow a similar path to the very professions they seek to dislodge (Larson, 1977; Berman, 2006).

Challenger occupations face a powerful opponent in the dominant profession. Because challenger occupations must dispel past beliefs and advance an alternative body of professional knowledge, they are an example of what Frickel and Gross (2005) have termed 'scientific/intellectual movements'. Scientific/intellectual movements are smaller in scale than mass social movements and more oriented towards cultural outcomes than political ones, but like other social movements, scientific/intellectual movements pursue their goals through the usual work of mobilization, including engaging their supporters, recruiting new members and developing communication channels (Gamson, 1975, pp. 66–70; Frickel and Gross, 2005, pp. 219–221). This reasoning suggests:

> **Hypothesis 1**: The more successful the mobilization efforts of a challenger occupation, the greater is its cultural authority.

The cultural authority of challenger occupations has important consequences for the institutional protection of dominant professions. The mere existence of an organized challenger

occupation calls into question the legitimacy of the dominant profession. Moreover, as challengers press their own claims of cultural authority and create their own training and certifying organizations, commitments by state authorities to defend the dominant profession's monopoly privileges may falter. Although state recognition has been viewed as the capstone of the professionalization process (Wilensky, 1964), there is no reason to believe that it is necessarily permanent. And challengers need not displace the dominant profession entirely. Instead, it may be sufficient to allow challengers to compete on a level playing field. We therefore predict:

Hypothesis 2: The greater a challenger occupation's cultural authority, the more likely a profession is to lose institutional protection.

2.2 Populist coalitions

Institutional protection of a professional monopoly typically hangs on the action of state officials. To obtain protection against rival occupations, professions must assemble political coalitions willing to grant them exclusive privileges (Bourdieu, 1991, pp. 171–202; Fligstein and McAdam, 2012, pp. 14–17). But other political groups can construct coalitions to block or nullify a profession's institutional protection. Indeed, opposition to professional privileges is as old as the professions themselves: periods of revolutionary democratization inspired calls for the abolition of professionals' privileges in 18th-century France and the 19th-century United States (Larson, 1977; Burrage, 2006).

Because the monopoly privileges afforded to professionals can be powerful symbols of exclusion and entrenched status, populist political parties frequently target them (Larson, 1977, pp. 113–135; Starr, 1982, pp. 40–59; Burrage, 2006). Professional monopolies benefit a tiny elite, and often one with connections to the political establishment. Anti-professional sentiments therefore fit well within the broader efforts of populist parties to stand against entrenched elites in the name of the people. The more electoral support populist parties earn, the more power they can exert over legislatures to abrogate a profession's monopoly privileges. Thus, we predict:

Hypothesis 3: The greater the support for populist political candidates, the more likely a profession is to lose institutional protection.

Social movement theory further suggests that the loss of a dominant profession's institutional protection can increase challenger occupations' cultural authority. The elimination of institutional protection is a clear example of what social movement theorists call a political opportunity, a change in the political environment that creates incentives for undertaking collective action (Tarrow, 1998; Meyer and Minkoff, 2004). The loss of institutional protection eliminates the profession's recourse to the machinery of government to defend its monopoly. Its absence means that clients and other occupations have less reason to defer to the profession's cultural authority and sends a powerful signal of the potential demand for alternative systems of knowledge. Thus, our final hypothesis is:

Hypothesis 4: Following a profession's loss of institutional protection, challenger occupational groups' cultural authority will increase.

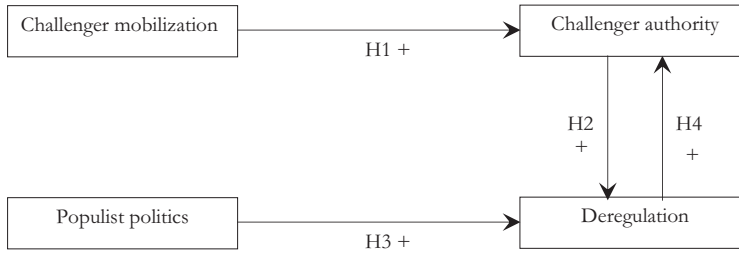


Figure 1 Summary of the argument.

2.3 Summary

Figure 1 illustrates our argument. It shows that opposition to a dominant profession can develop along two paths. First, mobilization by challenger occupations against the profession will increase challengers' cultural authority (Hypothesis 1), which will in turn increase the likelihood that the profession will lose institutional protection for its monopoly (Hypothesis 2). Second, greater populist political support will also increase likelihood that the profession will lose institutional protection (Hypothesis 3), which in turn will enhance challengers' cultural authority (Hypothesis 4). Taken together, the loss of institutional protection and the rise of challenger cultural authority reinforce one another, eroding the foundations of professional control over a market.

3. The Evolution of US Medicine, 1787–1860

To put our argument in context, we survey the development of medical practice in the USA from the Constitutional Convention to the Civil War. Throughout the 19th century, American medicine was riven by conflict between warring groups of practitioners. Scholars refer to these groups as medical sects. Like religious sects, each medical sect held its own distinct beliefs and asked members to pledge fellowship to the sect, as well as to distance themselves from the members of other sects (Rothstein, 1972, pp. 21–24; Starr, 1982, p. 95; Whooley, 2013, pp. 1, 46). Disputes between medical sects often hinged on arcane matters of medical doctrine that remained obscure to patients, but for practitioners they were nothing less 'epistemic contests' over what constituted valid medical knowledge and who was therefore qualified to offer medical care (Whooley, 2013).

3.1 Incumbent medical sects

At the end of the 18th century, professional power in medicine was the exclusive privilege of a narrow elite of *regular physicians* (Kett, 1968, p. 102; Rothstein, 1972, pp. 64–72; Starr, 1982, pp. 37–40).[3] Starr (1982, p. 40) estimates that at the time of the Revolution, not more than 200 men in the colonies held medical degrees, most of whom dwelt in Boston, New York City and Philadelphia. Typically the university-educated sons of affluent families, they

3 These practitioners and their followers called themselves regular physicians to distinguish themselves from their 'irregular' rivals. In the interest of fairness, we denote each medical sect using its preferred name.

possessed cultural authority as men of learning, and political authorities placed them in charge of quarantine inspections and the prosecution of 'quack' healers. For another 3500 regular physicians, the title 'doctor' was a mere courtesy (Starr, 1982, p. 40). Nearly all lacked a college education, having instead learned their craft through apprenticeship. What little cultural authority they possessed came from their association with elite physicians.

The divisions within the regular profession deepened in the early 19th century, and for good reason: prior to the development of the germ theory of disease regular medicine was shockingly ineffective. Many elite physicians clung dogmatically to 'heroic therapies' like bloodletting and doses of calomel (a compound of the poisonous metal mercury), which produced immediate—but sometimes fatal—responses in patients (Rothstein, 1972, pp. 125–128). Others, particularly those familiar with the recent quantitative studies of Pierre Louis and other Parisian clinicians, embraced a 'medical nihilism' that favoured doing little more than encouraging the body's own healing powers (Warner, 1998, pp. 283–290). Still others chose to trust primarily in their own judgement and experience (Warner, 1998, pp. 228–245). Nevertheless, strong demand for the healing arts ensured that regular physicians continued to multiply. By the eve of the Civil War, their ranks had swollen to over 55 000, the highest number of doctors per capita of any country in the world at the time (US Census Bureau, 2006).[4]

Despite their disagreements, regular physicians took a hard stand against other sects. The 'consultation clause' of the American Medical Association's (AMA) 1847 Code of Ethics forbade any member from fellowship or consultation with alternative practitioners (Rothstein, 1972, p. 171). Two other medical sects, *dentists* and *pharmacists*, escaped the ban on consultation by deferring to regular physicians (Bremner, 1954; Kremers *et al.*, 1963). Dentists and pharmacists saw themselves as inheritors of the same medical tradition embodied by regular physicians. Their leading members earned degrees in regular medical colleges, and when they set up their own colleges in the 1830s and 1840s, they hired regular physicians as instructors. It is illustrative that when the dentist William T. G. Morton made the first public demonstration of surgical anaesthesia in 1846, he did so before the Harvard medical faculty, not his fellow dentists (Howe, 2007, pp. 473–474). As dentists and pharmacists took pains not to challenge the cultural authority of regular physicians, we treat all three groups as incumbent medical sects.

3.2 Challenger medical sects

Not all relations between medical sects were so peaceable. The ineffectiveness of regular physicians' treatments created opportunities for more forceful opponents. The earliest were the *Thomsonians*, followers of Samuel Thomson, a self-taught healer, who devised a new system of medicine at the start of the 19th century (Haller, 1994, 1997). To Thomson, regular physicians' knowledge was needless mystification and their medicines were dangerous poisons. An ardent believer in the curative powers of nature, Thomson's patented system relied on treatments derived from native plants, such as Indian tobacco (*Lobelia inflata*) and cayenne peppers. His system soon attracted disciples, who Thomson commissioned to sell his books and found 'Friendly Botanical Societies' across the USA.

4 The 1860 Census did not distinguish between regular physicians and members of other sects. We estimated the proportion of regular physicians to be ~88%, based on an 1873 Census of the medical profession (Haller, 1994).

Thomson's strict prohibitions against deviations from his original system led to schisms. The most important factions were the *eclectic* or *reformed* followers of Wooster Beach and the *physio-medical* followers of Alva Curtis. Beach rejected Thomson's skepticism toward formal schooling and opened a teaching infirmary in 1826 (Haller, 1994). Beach's eclectics, true to their name, sought to take the best from every medical sect. Curtis broke with Thomson 10 years later because he wanted to systematize botanical medicine into a sophisticated philosophy of harmonies between the vital forces of botanical drugs and patients' bodies (Haller, 1997).

Additional medical sects arrived from Europe and won converts of their own. Each had its own theory of disease and its own preferred treatments. Of them, *homeopathy* was by far the most successful (Haller, 2005; Whooley, 2013). Homeopathy had been founded in Germany by Samuel Hahnemann, a physician disillusioned with regular medicine, and the first homeopathic practice opened in the USA in 1825. Hahneman's system was based on the maxim *simila similibus curantur*, meaning a disease can be cured by drugs that produce similar effects on a healthy body. Homeopaths rejected the therapies of the regular or 'allopathic' physicians in favour of small, highly diluted doses of their own medicines.[5] Although their prescriptions were often little more than pure water, homeopaths demonstrated through careful observation and quantitative analysis that their mild drugs led to fewer deaths than the bloodletting and doses of mercury favoured by regular physicians.

Hydropathy or the *water cure* was imported from Britain by way of Germany beginning in 1843 (Weiss and Kemble, 1967). Hydropaths proposed that water, the natural sustainer of life, possessed powerful curative properties. The most popular form of water cure in the USA was based on the system of Vincent Priessnitz, an Austrian peasant farmer and autodidact. It involved drinking 20–30 glasses of water per day, cold water baths, copious exercise and the application of wet-sheet packs: the patient was wrapped in a sheet dipped in cold water, dry blankets were added until the patient perspired freely, and then the patient was plunged into a cold bath.

More challengers followed. By the mid-19th century, the above medical sects competed for patients with Mesmerists, Grahamites, electropaths, iatroleptic doctors and others. Challenger medical sects came to constitute a flourishing 'medical counterculture' that rivaled the regular profession in legitimacy (Starr, 1982, pp. 47–54).

3.3 Sources of cultural authority: medical colleges

The main sources of cultural authority for 19th-century medical sects were medical colleges, which trained and credentialed practitioners. The earliest medical colleges in the USA were Columbia University Medical School in New York (founded in 1767 as King's College School of Medicine), the University of Pennsylvania School of Medicine (1765) and Harvard Medical School (1782). Each taught regular medicine according to the model of the University of Edinburgh, then the most important in Britain (Jarcho, 1975; Bonner, 1995, pp. 42–43). As in Edinburgh, instruction consisted mainly of lectures and demonstrations. Students were expected to gain practical experience elsewhere—either at hospitals or through apprenticeships. The US colleges differed from Edinburgh, however, in that they

5 Homeopaths called regular physicians allopaths because regulars sought to cure disease with the opposite (ἄλλος or *allos* means 'other' in Greek), while homeopaths sought to cure disease with the similar (ὅμοιος or *hómoios* means 'like' in Greek).

did not have exclusive rights to issue medical degrees. This difference would prove consequential.

Early in the 19th century, a new kind of medical college appeared. Proprietary medical colleges were for-profit enterprises that offered medical degrees (Kett, 1968, p. 65; Rothstein, 1972, pp. 94–96; Jarcho, 1975). Some were little more than diploma mills although others offered a similar curriculum to their non-profit counterparts (Jarcho, 1975; Starr, 1982, pp. 40–44; Bonner, 1995, pp. 176–179). Because regular physicians had no power to suppress new medical schools, the founding of proprietary schools was limited only by their ability to attract students, teachers and investors. Indeed, disputes among regular physicians contributed to the proliferation of medical schools, as quarrels between faculty members often led the losers to found a rival school. Even Harvard Medical School was converted into a proprietary institution in 1810 and remained so until its reorganization under Charles Eliot in the 1870 s (Larson, 1977, p. 161; Starr, 1982, pp. 114–115). Pharmacists and dentists emulated regular physicians by founding schools, starting in 1825 for pharmacy (Kremers *et al.*, 1963) and 1842 for dentistry (Bremner, 1954). Schools for challenger medical sects also appeared in the first half of the 19th century: the eclectics established their first school in 1826 (Haller, 1994), physio-medicalists in 1838 (Haller, 1997), homeopaths in 1835 (Haller, 2005) and hydropaths in 1851 (Weiss and Kemble, 1967).

Although medical colleges remained small by contemporary standards (they were rarely staffed by more than a half-dozen professors), their numbers exploded after 1800, as shown in Figure 2. By 1860, over 50 incumbent-sect medical colleges held classes in more than two-thirds of all states. The number of eclectic colleges reached its antebellum peak of eight in 1856, while colleges for homeopaths, physio-medicalists and hydropaths were still gaining strength in 1860, with six, three and one, respectively. At the national level, incumbent-sect medical colleges outnumbered challenger-sect colleges by nearly four to one, but in Southern and Western states where regular physicians were scarce, challenger-sect colleges were nearly as common as regular colleges. Even on the frontier, as many as two-thirds of all medical practitioners could boast of a medical degree by 1860 (Lawrence, 2003, p. 165).

3.4 Sources of institutional protection: state licensing laws

The main form of institutional protection for medical professionals in this era was state issuance of licenses.[6] Already in the colonial period, New York and New Jersey invested government officials with the power to issue medical licenses and appoint medical boards to examine physician candidates (Kett, 1968; Rothstein, 1972). After the Revolution, these powers were transferred to state medical societies. In New Jersey, licensing examinations became an official duty of the state medical society upon its founding in 1776 (Wickes, 1879). In New York, licensing examinations passed from a circle of physicians associated with Columbia University to the Medical Society of the State of New York once latter was chartered in 1794 (Walsh, 1907). Although each society nominally represented all physicians in their states, both were controlled by a narrow elite: at their founding, the New York society had no members from outside Manhattan, and the New Jersey society was run by a circle of New Brunswick physicians.

6 Other forms, such as laws limiting competition between professionals and *numerus clausus* restrictions on professional school enrollments, did not appear until the late-19th century.

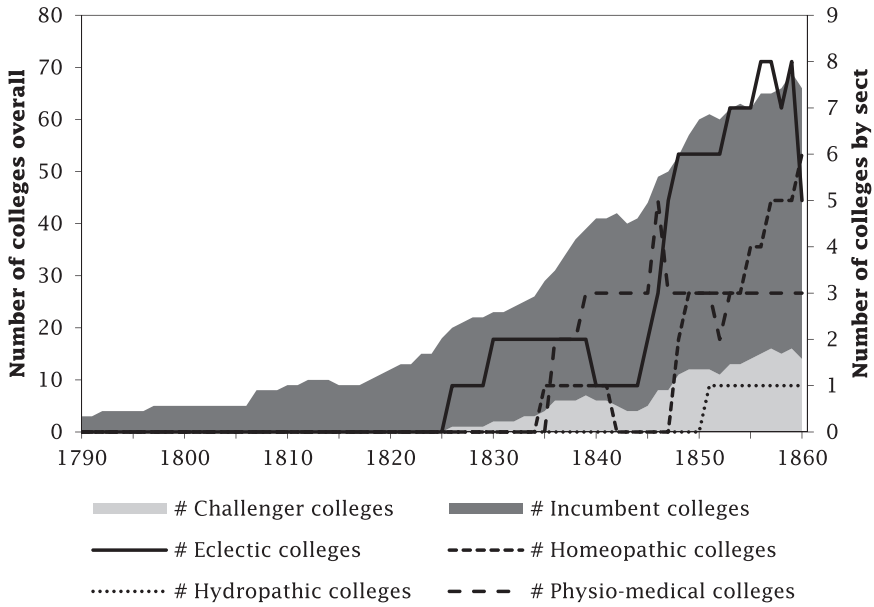
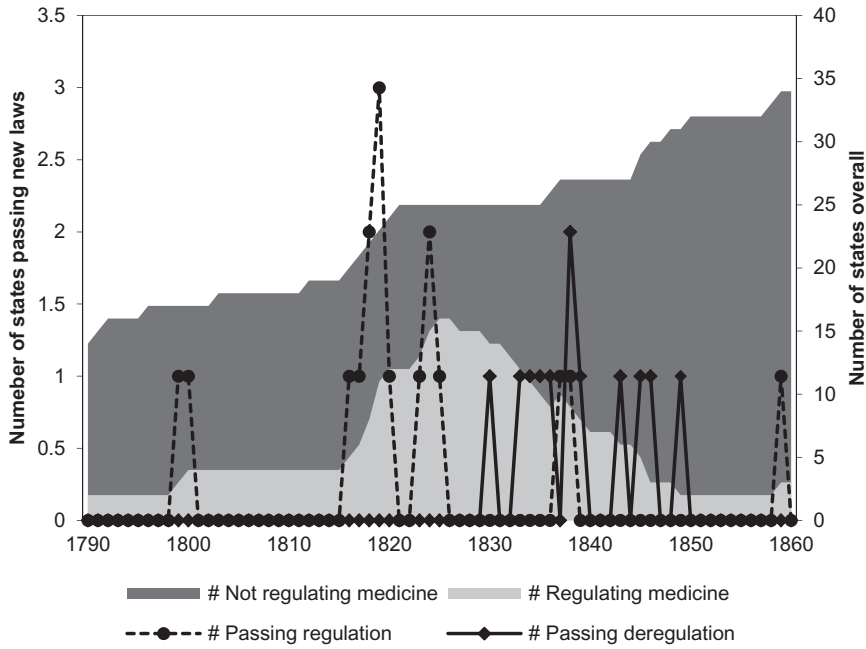


Figure 2 The number of medical colleges by sect, 1790–1860.

Over the next three decades, more and more states granted licensing authority to regular medical societies. Figure 3 charts the number of states with medical licensing laws between 1790 and 1860. The number rose from two in 1790 to four in 1801, then shot up to 12 in 1820 and peaked at 16 in 1825, when about two-thirds of states had licensing laws. Medical licensing laws gave regular physicians an official imprimatur and set legal penalties for the unlicensed practice of medicine. In most cases, laws permitted only licensed physicians to sue for fees in a court of law, and some states set monetary penalties for practicing medicine without a license, ranging from $5 to $25. (In 1825, these fines would have equalled $118 to $588 in 2016 dollars.) Although such penalties were modest and difficult to enforce, they sharpened the distinction between state-sanctioned regular physicians and their rivals.

These early victories for regular physicians would prove to be short-lived. Between 1830 and 1850, state licensing laws were repealed almost as quickly as they had been passed. An initial warning came in 1827, when the state of Illinois failed to recruit enough members of the local medical community to staff its licensing board (Rothstein, 1972, Appendix II). Three years later, the Indiana board folded for lack of examiners (Rothstein, 1972, Appendix II). In more populous Eastern states, licensing boards were met with public hostility in addition to professional indifference. Here is a typical assessment from a New York newspaper in 1833:

> *Medicine*, like every useful science, should be thrown open to the observation and study of all ... . We should at once explode the whole machinery of mystification and



Note: Annual counts of incidents of deregulation do not included cases where the enforcement of regulation lapsed. See main text for details.

Figure 3 The number of states regulating medicine, 1790–1860.

> concealment—wigs, gold canes, and the gibberish of prescriptions—which serves but as a cloak to ignorance and legalized murder! (Quoted in Starr, 1982, p. 56.)

State officials answered complaints against regular physicians by nullifying their licensing privileges or carving out exemptions for other sects. In most states, medical societies became private associations. Legislators in Georgia, Mississippi and Ohio disbanded their state medical societies completely. On the eve of the Civil War, regular physicians retained licensing power only in New Jersey, North Carolina and the District of Columbia. Their monopolies had been replaced by raucous free markets for medical care.

3.5 Professional mobilization: medical magazines

All medical sects relied on magazines as mobilizing devices, much like religious and social reform groups during this era (Tarrow, 1998, 43–53; Haveman, 2015, pp. 205–212). As scientific/intellectual movements, each medical sect used magazines to promote their own body of knowledge over that of other sects (Frickel and Gross, 2005). Magazines were inexpensive to produce and distribute through the mail, and they circulated more widely than newspapers. Moreover, the serial nature of magazines made possible reciprocal relationships among editors, writers and readers. Readers sent in reports on advances in therapy, interesting medical cases and the activities of the sect, while editors helped to consolidate sectarian knowledge and sustain a sense of common purpose. For the widely scattered members of

Figure 4 The difference between the regular and Thomsonian systems of medicine.
Source: The Thomsonian Botanic Watchman (1832, p. 8).

medical sects—most of them in solo practice—magazines were the most practical way to engage with one another.[7]

The primary audiences of medical magazines were members of the sect. Medical magazines armed their readers with blistering attacks on other sects (Cassedy, 1983; Whooley, 2013). Their tone 'alternated from condescension to sarcasm, from enthusiastic advocacy to bitter invective, all with the aim of discomfiting or defeating medical foes' (Cassedy, 1983, p. 144). Regular physicians dismissed challenger sects as ignorant and deceitful quacks, pretenders and charlatans (Whooley, 2013, pp. 73–108). One regular physician declared that 'it is both difficult and useless to reason with the enthusiastic and credulous believers in any novel system . . . . [Such a man] is better fitted for a lunatic hospital than the practice of the healing art'. (Quoted in Rothstein 1972, p. 165.) Challenger medical sects condemned regular physicians for their dangerous treatments. For example, Figure 4 shows an 1832 illustration from the *Thomsonian Botanical Watchman*. It contrasts the regular physician on the

7 There were two other important forms of sectarian organization: colleges and local medical associations. But most sect members were simply too far apart to participate frequently in the face-to-face meetings of local associations, and colleges trained offered little in the way of professional engagement after graduation.

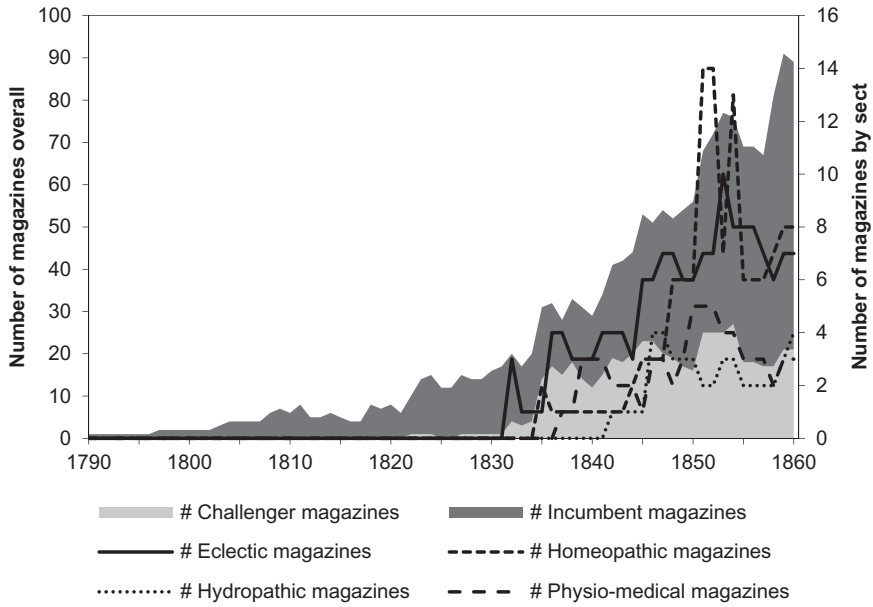


Figure 5 The number of medical magazines by sect, 1790–1860.

left with the Thomsonian doctor on the right. The regular physician, distinguished by his medical doctorate ('MD'), membership in a scientific society ('FRS' for Fellow of the Royal Society) and heavy club of calomel (a typical heroic treatment), stands on the steps of inconsistency and drives his patient back into the slough of disease via bloodletting and blows from his club. The voice of reason, centre, declares the regular physician 'scientific with a vengeance', but directs his attention to the Thomsonian doctor, who lifts his patient up the steps of common sense. Magazines affiliated with other challenger medical sects published attacks on regular physicians that were equally scornful.

The regular physicians of the Massachusetts Medical Society published the first US medical magazine, the *Medical Papers*, in 1790. As Figure 5 shows, as late as 1820, there were fewer than 10 medical magazines in print, all affiliated with regular medicine. But by 1850, there were over 50 medical magazines, an increase driven primarily by challenger medical sects. The earliest of these spread the gospel of Thomsonian medicine followed by magazines for eclectics and physio-medicalists (Haller, 1994, 1997). The first magazine for homeopathy appeared in 1835; by 1860, nearly a dozen were in print (Haller, 2005). In the 1840s, Journals of Hydropathy appeared alongside those devoted to mesmerism and phrenology (Weiss and Kemble, 1967). Between 1830 and 1860, the number of magazines published by challenger sects rivalled or exceeded the number published by incumbent medical sects.

3.6 Political mobilization: populism

In the 19th-century United States, national parties were the main vehicle for political participation (Benson, 1961; McCormick, 1966). Parties commanded high rates of voter

participation and intense loyalty, often rooted in regional, ethnic and religious identities. Presidential campaigns inspired especially intense passions. Far from being the staid affairs of today, presidential campaigns during this period were spectacles that 'enabled voters throughout the nation to experience the thrill of participating in what amounted to a great democratic festival' (McCormick, 1966, p. 350).

The earliest national parties, the Federalists and the Democratic-Republicans, were coalitions of notables with only weak connections to state and local political operations (Benson, 1961; McCormick, 1966). Between 1787 and 1824, the political environment changed dramatically, driven by improvements in communication and transportation, the gradual widening of white male suffrage, a shift to choosing presidential electors by popular vote and the first appearance of professional political operatives (Benson, 1961; McCormick, 1966; Engermann and Sokoloff, 2005). By the 1824 presidential election, Andrew Jackson, a political outsider, was able to win the largest share of votes in a four-candidate race although he was denied the presidency when the decision was sent to the House of Representatives. Four years later, Jackson swept into office with a decisive victory over the incumbent, John Quincy Adams.

Jackson's newly founded Democratic Party took an increasingly populist stance during his first term. Although neither Jackson nor his allies had previously displayed populist commitments, they were quick to harness popular discontent with political elites (Wilentz, 2005). Jackson made his crusade against the Bank of the United States the dominant issue of the 1828 election, framing his opposition as a struggle against a dangerous monopoly that held exclusive privileges at the expense of 'the people'. With Jackson preparing to step down from the presidency in 1840 and the country still reeling from the Panic of 1837, the Democratic Party worked these themes into its national platform, declaring that 'every citizen and every section of the country has a right to demand and insist upon an equality of rights and privileges' (Democratic Party National Convention, 1840). Minor parties like the Working Men, the Anti-Masons and the Free Soilers took up the same call (Benson, 1961, pp. 21–46). Democratic and third-party presidential candidates continued to fan the flames of populism until 1852, when both Democrats and their Whig rivals split along regional lines over the issue of slavery.

It was in this environment that professional licensing became a matter of political contention. Jacksonian politicians denounced the professions as 'licensed monopolies' that held exclusive privileges over matters best left to the common sense of ordinary men (Benson, 1961; Wilentz, 2005). The 1848 Democratic platform declared that 'a high and sacred duty is devolved' upon the Democratic Party 'to resist all monopolies and exclusive legislation for the benefit of the few at the expense of the many' (Democratic Party National Convention, 1848). The issue of medical licensing in particular resonated with the Democratic base of rural whites, German Lutheran and Irish Catholic immigrants, and religious sects outside the Protestant mainstream (Benson, 1961). Rural whites had little access to medical care besides botanical doctors and German immigrants trusted homeopathic co-ethnics, while hydropaths moved in the same circles as free-thinkers and spiritualists. In contrast, the Whigs were tied to industrialists and the Protestant establishment, and poorly placed to capitalize on the anti-monopoly spirit. Although the Whigs embraced some aspects of populism, they demurred on the issue of professional licensing.

4. Research design

4.1 Data sources and measures

To test our hypotheses, we collected data from 1787, the year of the Constitutional Convention, to 1860, the year before the Civil War broke out. Our data cover all 33 states admitted to the Union by 1860, plus the District of Columbia.

Cultural authority: medical colleges. We gathered data on medical colleges from several sources. The AMA's *Medical Colleges of the United States and of Foreign Countries* (1918) covered regular-sect colleges, but it excluded many challenger-sect colleges as well as pharmacy and dental colleges. For these, we turned to histories of other medical sects. For eclectic, physio-medical and homeopathic colleges, we relied on Haller (1994, 1997, 2005). For hydropathic colleges, we used Weiss and Kemble (1967). For colleges of dentistry and pharmacy, we used surveys by Bremner (1954) and Kremers *et al.* (1963), respectively. Seven medical sects founded at least one college before the Civil War: eclectics, physio-medicalists, homeopaths, hydropaths, regular physicians, dentists and pharmacists. We found no evidence that any other medical sect ever established a college in this period. To measure cultural authority, we counted *the number of medical colleges* affiliated with each sect for every year and every state.[8]

Institutional protection: medical licensing. Our main sources on state medical licensing laws were Appendices I and II of Rothstein's (1972) study, which provided detailed information on medical licensing statutes and state medical boards, respectively. We validated these data with Kett's (1968) less compendious but more granular history of medical licensing law in five states. We coded each state–year observation into one of three categories: *unregulated* if licensing laws had not yet been passed or were 'dead-letter' law, *regulated* if licensing laws were in place and enforced and *deregulated* if the state had suspended either the licensing powers of societies or the privileges of licensed practitioners.

The deregulation of medicine followed several paths. In some states, courts, governors or legislatures overturned medical licensing laws *in toto*. In others, they chipped away at licensing authorities' regulatory power by eliminating licensed physicians' privileges or by granting exemptions to other medical practitioners. For cases of gradual deregulation, we coded deregulation conservatively as starting from the first date licensing laws lost their power to restrain regular physicians' rivals. In still other states, licensing laws remained on the books, but licensing boards were either not appointed or refused their responsibilities. We coded these states as lapsing back into the unregulated category (but not as deregulated) because state authorities did not take decisive action against the regular medical profession.

Challenger mobilization: medical magazines. Data on medical magazines came from a dataset of all magazines published in the USA up to the Civil War, assembled from 9 primary and 100 secondary sources (Haveman, 2015). The data exclude newspapers, pamphlets, almanacs and occasional tracts. Using histories of magazines and medicine, we were able to identify the affiliation of 402 of the 408 medical magazines published in this period (99%). We dropped unaffiliated medical magazines from the analysis, as well as 13 magazines affiliated with sects that had no clear stance vis-à-vis regular physicians, such as dietary movements and physical culture advocates. To measure mobilization, we calculated the

8 For the sake of simplicity in exposition, we use the word 'state' to refer to all the jurisdictions we study, including the District of Columbia.

percentage of medical magazines that were published by each challenger sect in every state and year. We controlled for the total number of magazines published by all challenger sects and all incumbent sects.

A total of 106 magazines were published by the 4 main challenger sects (eclectic medicine, physio-medicine, homeopathy and hydropathy), and 207 by the 3 main incumbent sects (regular medicine, dentistry and pharmacy). Another 57 magazines were published by orthodox Thomsonians and 14 by small challenger sects: mesmerism (6 magazines), phrenology (3), naturopathy (3), electropathy (1) and iatroleptic medicine (1). The remaining four magazines were about the deaf and dumb, psychiatry, psychology and veterinary medicine. We classified these four as incumbent-sect magazines.

Populist politics: presidential elections. We measured *populism* with the percentage of votes cast in the most recent presidential election for populist candidates. In states where the legislature selected Electoral College delegates, we used the percentage of votes cast by the legislature for populist candidates.[9] Based on historical surveys of politics (Benson, 1961; McCormick, 1966; Wilentz, 2005), we classified the following presidential candidates as populists: Andrew Jackson (candidate in 1824, 1828 and 1832), William Wirt (1832), Martin Van Buren (1836, 1840 and 1848), James K. Polk (1844), Lewis Cass (1848), Franklin Pierce (1852) and John Hale (1852). This list include all Democratic Party nominees under what political scientists have come to call the Second Party System (1828–1852), plus Jackson's unsuccessful first run for the presidency in 1824 and the nominees of the Free Soil and Anti-Masonic Parties. We gathered election data from the *Historical Statistics of the United States* (US Census Bureau, 2006) and Leip (2012). In the years preceding the rise of populism in American national politics (1824) and after that movement's decline (1852), this variable equaled zero.

Control variables. To discount alternative explanations, the statistical analyses controlled for other determinants of professional power. To capture the expanding market for medical services, we used *gross national product* (in constant 1860 dollars), *state population* (in millions), the percentage of the state's population living in *urban areas* (those with more than 2500 inhabitants) and *state land area* (in square miles). To capture scientific progress, we used annual counts of *non-medical colleges* (at the state level) and *patents* (national level). Data on state population, state area, gross national product and patents came from the *Historical Statistics of the United States* (US Census Bureau, 2006). Data on colleges came from Marshall (1995). Data on urbanization came from Purvis (1995), Moffat (1992, 1996) and the second author's internet searches.

4.2 Methods of analysis

We analysed two dependent variables: the number of colleges affiliated with each challenger sect (cultural authority), and whether or not each state eliminated licensing laws that protected regular physicians (institutional protection).

Challenger-sect colleges. In this analysis, the data took the form of sect–state–year observations. Each state entered the analysis at the first year of statehood, and each sect at the first year a practitioner appeared in the country. Table 1 includes descriptive statistics for each

9 In South Carolina, the state legislature selected electoral representatives but did not record their vote. Instead, they placed all their support behind the winning candidate. Here, we coded the variable one if the legislature selected a populist candidate and zero otherwise.

Table 1 Descriptive statistics

State-level variables	Min	Max	Mean (Std. dev.)	*N*
Medical colleges				
No. of eclectic colleges	0	3	0.126 (0.410)	1000
No. of homeopathic colleges	0	1	0.054 (0.227)	1025
No. of hydropathic colleges	0	1	0.018 (0.132)	562
No. of physio-medical colleges	0	2	0.097 (0.305)	750
No. of all incumbent colleges	0	8	0.910 (1.281)	1711
No. of all challenger colleges	0	5	0.155 (0.571)	1711
Medical magazines				
Eclectic magazines (%)	0	1	0.031 (0.120)	1000
Homeopathic magazines (%)	0	1	0.027 (0.116)	1025
Hydropathic magazines (%)	0	1	0.012 (0.080)	562
Physio-medical magazines (%)	0	1	0.021 (0.092)	750
No. of all incumbent magazines	0	16	0.697 (1.682)	1711
No. of all challenger magazines	0	11	0.330 (1.092)	1711
Other variables				
Populism (%)	0	1	0.255 (0.297)	1711
Regulation	0	1	0.259	1711
Deregulation	0	1	0.155	1711
State population (millions)	0.012	3.900	0.547 (0.539)	1711
State area (100 000 miles^2)	0.001	2.624	0.345 (0.328)	1711
State urban population (%)	0.005	0.936	0.149 (0.170)	1491
No. of colleges (non-medical)	0	21	3.124 (3.221)	1711
Years of statehood	0	73	30.780 (20.507)	1711
National-level variables				
GNP ($1000s)	0.153	3.972	1.120 (1.161)	74
Patents (1000s)	0	4.588	0.575 (0.912)	74

sect. Pooling data on the four largest challenger sects yielded 3337 sect–state–year observations.

This analysis included parameters for magazines affiliated with the focal challenger sect (Hypothesis 1), regulation (Hypothesis 4) and populism, plus controls for colleges and magazines affiliated with incumbent and other challenger sects, and other determinants of professional power. We included lagged dependent variables because the number of colleges operating in one year is highly correlated with the number of colleges operating in the previous year. For the regulation and deregulation dummies, the reference category is unregulated. We lagged all independent variables one year to reduce endogeneity, decreasing the number of observations from 3337 to 3201.

Since the number of colleges for each group and state and year is overdispersed, we estimated negative binomial regressions (Long, 1997). To control for unobserved period-specific characteristics, we estimated parameters for a baseline polynomial function using natural cubic splines (Beck *et al.*, 1998). These results were essentially the same as results for models that included year fixed effects, but estimating the cubic spline parameters was much more computationally tractable. To control for unobserved time-invariant characteristics of states and medical sects, we included fixed effects for region (New England, Mid-Atlantic,

South, West), and sect (eclectic, homeopathic, hydropathic, physio-medical).[10] The results should therefore be interpreted in terms of population means.

Medical deregulation. For this analysis, the data took the form of state–year observations, starting with the first year the state was at risk of deregulation; i.e. the first year after state regulation. The dependent variable was set to zero when the focal state regulated medicine and one after its medical licensing law had been abolished or nullified. Each state remained in the analysis until it eliminated medical regulation or 1860, whichever came first. In states where deregulation never occurred, we treated the data as right-censored in 1860, and in states where licensing boards abandoned their responsibilities, we treated the data as right-censored the year the board lapsed. We analysed 456 state–year observations: 444 observations of regulation and 12 of deregulation.

The analysis included parameters for populism (Hypothesis 3), challenger-sect colleges (all sects aggregated) (Hypothesis 2) and challenger-sect magazine share (all sects aggregated), plus controls for colleges and magazines affiliated with incumbent sects and other determinants of professional power. We lagged independent variables to reduce endogeneity, reducing the number of observations only from 456 to 452 because our analysis covers all but four states before regulation.

Because deregulation occurred only once per state, we used event history methods, specifically proportional hazard models (Cox, 1972). To control for unobserved period-level factors, we defined the baseline hazard function according to the year of observation. We could not include national-level controls in the analysis because they would be overdetermined. With only one event per state, we cannot control for the unobserved time-invariant qualities of each state, so we included region fixed effects.

Endogeneity. Using lagged independent variables does not fully eliminate endogeneity. If deregulation fostered the founding of challenger-sect colleges and challenger-sect colleges promoted deregulation, then both variables depend on prior levels of the other. A similar issue arises with magazines if magazines encouraged the establishment of colleges and the existence of colleges encouraged sects to publish magazines.

In models of *challenger-sect colleges*, endogeneity largely took the form of selection into levels of regulation and magazines based on previous levels of challenger-sect colleges. Adding a lagged dependent variable can reduce bias due to endogenous treatment selection (Vaisey and Miles, 2017). Obtaining consistent and unbiased estimates, however, depends on proper specification of the dynamic response function (Beck and Katz, 2011). We therefore compared several model specifications to see if they offered improvements over models with the lagged dependent variable.

The relationship between magazines and medical colleges raised additional concerns. For magazines, there may be endogeneity due to *both* treatment selection and the unobserved qualities of medical sects. We therefore used the instrumental variable technique, which addresses both sources of endogeneity (Greene, 2003, pp. 378–401). To yield consistent and unbiased parameter estimates for an endogenous variable, an instrumental variable must (a) be correlated with the endogenous variable, (b) act on the dependent variable only through the endogenous variable and (c) be uncorrelated with the error term. Miles of postal roads

10 There is insufficient variation to estimate fixed effects for state or sect-state since the number of schools in any state affiliated with each of these challenger sects is one or zero in the large majority of observations.

in a state meet these criteria. First, the post office was the main distribution channel for magazines. Miles of postal roads is a statistically significant predictor of magazine market share, net of a raft of controls. Second, the postal system benefitted challenger sects only through magazines: miles of postal roads had no effect on the number of medical colleges. Third, challenger sects were minor users of the postal system and did not influence postal expansion. Instead, postal expansion was driven by state population, landmass and urbanization; these also influenced college founding, but we included them as controls in models of medical colleges.

In models of *medical deregulation*, endogeneity took the form of selection into and out of the risk set for deregulation. Because deregulation was a one-time event for each state, we cannot use a dynamic framework as we did for challenger-sect colleges. Deregulation may predict an increase in the number of challenger-sect colleges, and the number of challenger-sect colleges may predict deregulation. But deregulation cannot predict challenger-sect colleges, which then predict deregulation *in a single state*. It is therefore impossible to lag the dependent variable and very difficult to compare different lagged specifications for the independent variables. Sample selection models are also not appropriate because we cannot make the necessary assumptions about the error term. We can, however, reduce any bias due to the timing of entry into the risk set by adding a variable for years since the onset of regulation in the focal state. We also attempted to assess the direction of bias due to any remaining endogeneity by examining how the number of challenger-sect colleges and levels of populism predicted the chances of regulation; i.e. entry into the risk set in the first place.

5. Results

5.1 Challenger-sect colleges

Table 2 reports negative binomial regressions of the number of medical colleges affiliated with the focal challenger sect. We predicted positive effects for challenger mobilization (Hypothesis 1) and medical deregulation (Hypothesis 4). To test these predictions, Model 1 includes the percentage of magazines affiliated with the focal sect and the regulation variable. Mobilization through magazines and medical deregulation are both strongly associated with the number of challenger-sect colleges, consistent with hypotheses 1 and 4. A 10% increase in magazine share for the focal sect increases the expected number of challenger colleges in the following year by 22% (exp[1.969/10]=1.22). After medical licensing regulations are eliminated, challenger sects operated 3.75 times as many colleges as before deregulation (exp[0.664]/exp[−0.658]=3.75), and twice as many colleges as states where regulation never existed (exp[0.664]=1.94).

The coefficients on regulation and deregulation may reflect variation in the broader political environment. To assess this alternative explanation, Model 2 adds state-level support for populist candidates. This variable has a modest and non-significant effect: a 10% increase in the populist vote share increased the expected number of challenger colleges by 3% (exp[0.286/10]=1.029). This suggests that medical licensing laws, and not the wider political environment, dissuaded challenger sects from founding colleges or made states less likely to grant them charters.

Model 3 adds controls for the activities of other medical sects. Incumbent-sect colleges have a positive effect on challenger-sect colleges, perhaps because incumbent-sect colleges are proxies for economic and technological factors that promote the founding of all medical

Table 2 Negative binomial models of challenger medical colleges

Model	1	2	3	4
No. of colleges	2.616***	2.606***	2.135***	1.095+
	(0.243)	(0.246)	(0.347)	(0.653)
Medicine regulated	−0.658*	−0.633*	−0.705*	−0.258
	(0.306)	(0.305)	(0.337)	(0.324)
Medicine deregulated	0.664***	0.661***	0.366**	0.354*
	(0.119)	(0.119)	(0.137)	(0.150)
Magazines (%)	1.969***	1.987***	2.204***	2.380***
	(0.314)	(0.315)	(0.316)	(0.316)
Populism (%)		0.286	0.145	0.578
		(0.306)	(0.322)	(0.783)
No. of colleges (incumbent)			0.182**	−0.168*
			(0.068)	(0.071)
No. of colleges (other challengers)			0.140	−0.347*
			(0.103)	(0.134)
No. of magazines (incumbent)			−0.009	−0.058
			(0.049)	(0.039)
No. of magazines (all challengers)			0.056	0.024
			(0.059)	(0.050)
State population (millions)				1.264***
				(0.247)
State area (100 000 miles^2)				1.649**
				(0.572)
State urban population (%)				0.625
				(0.574)
No. of colleges (non-medical)				0.082*
				(0.037)
Years of statehood				0.070**
				(0.022)
GNP ($1000s)				0.266
				(0.630)
No. of patents (1000s)				−0.084
				(0.463)
Overdispersion	−0.921***	−0935***	−1.284**	−4.057
	(0.252)	(0250)	(0.392)	(14.587)
Constant	−1.701	−3600	−12.620	−7.121
	(8.292)	(8.898)	(10.509)	(21.537)
Cubic spline parameters?	Yes	Yes	Yes	Yes
Regional and group fixed effects?	Yes	Yes	Yes	Yes
No. of observations	3201	3201	3201	2965
Log-pseudolikelihood	−475.41	−475.19	−465.00	−436.04

Notes: Table reports coefficient estimates. Robust standard errors are in parentheses below point estimates. + indicates $P < 0.10$, *$P < 0.05$, **$P < 0.01$ and ***$P < 0.001$, two-tailed tests.

Table 3 Proportional hazard models of medical licensing deregulation

Model	1	2	3	4
Years of regulation	0.052*	0.052**	0.063*	0.083**
	(0.020)	(0.020)	(0.032)	(0.026)
No. of colleges (challenger)	2.935**	2.569*	1.782	4.609*
	(1.006)	(1.316)	(1.460)	(1.851)
Populism (%)	3.145**	3.237**	3.422**	4.486***
	(1.188)	(1.190)	(1.214)	(1.259)
Challenger magazines (%)		1.175+	1.291	−0.571
		(0.684)	(0.819)	(1.616)
No. of colleges (incumbent)			0.469	1.773
			(0.454)	(0.487)
No. of medical magazines			0.042	0.667
			(0.372)	(0.516)
State population (millions)				−0.212
				(2.319)
State area (100 000 miles^2)				−10.41+
				(5.923)
State urban population (%)				−6.280
				(4.503)
No. of colleges (non-medical)				−0.861
				(0.578)
Years of statehood				−0.056
				(0.035)
Regional strata?	Yes	Yes	Yes	Yes
No. of observations	452	452	452	405
Log-pseudolikelihood	−15.636	−15.123	−14.436	−9.326

Notes: Table reports coefficient estimates. Robust standard errors are in parentheses. $^{+}P < 0.10$, $^{*}P < 0.05$, $^{**}P < 0.01$ and $^{***}P < 0.001$, two-tailed tests.

colleges. To probe this possibility, Model 4 introduces controls for economic and technological development. The coefficient for incumbent-sect colleges becomes negative and significant, supporting this interpretation. Three other results are of interest here. First, the coefficient for regulation declines dramatically, suggesting that economic development may explain increases in medical regulation. Second, the coefficient for other challenger-sect medical colleges is negative and statistically significant. The cultural authority of one challenger sect diminished if other challenger sects were stronger, indicating that challenger sects competed. Finally, medical magazines published by any sect had no significant effects. It appears that the relative dominance of a given sect explains its cultural authority, not the overall level of mobilization through magazines.

5.2 Medical deregulation

Table 3 reports the event history analysis of medical deregulation. Above, we predicted positive effects of challenger cultural authority (Hypothesis 3) and support for populist candidates (Hypothesis 2). Model 1 tests these predictions and finds strong support for both.

Every additional college operating in a state increased the likelihood of abrogating medical regulations by a factor of almost 20 (exp[2.935]=18.8). And every additional 10% support for populist candidates increased the hazard of deregulation by 37% (exp[3.145/10]=1.37). A state where populist candidates enjoyed two-thirds support was over eight times more likely to eliminate licensing regulations the following year than a state where populists had no support at all (exp[3.234 × 0.67]/exp[3.234 × 0]=8.22). Finally, the timing of regulation also matters: states were more likely to deregulate medicine the longer regulations had been in force.

We assessed the robustness of these results by adding controls. Model 2 adds the percentage of magazines published by all challenger sects. The coefficient is positive but only marginally significant, suggesting that this mobilizing device played an uncertain role in medical deregulation. Model 3 adds the number of incumbent-sect colleges and the total number of magazines published by all sects. These do no substantively change the results, except to reduce the significance of the challenger-sect colleges and challenger-sect magazines. Model 4 adds controls for economic and technological development. Neither appears to have played a significant role in deregulation, but coefficients on challenger-sect colleges and support for populist candidates both are now larger and more significant, suggesting that differences between states may have partly masked those relationships.

5.3 Endogeneity

To test the specification of the dynamic response function in the analysis of challenger-sect colleges, we followed Beck and Katz (2011) and compared the LDV model to an autoregressive distributed lag (ADL) model and an ADL model with a second lag on the dependent variable (ADLLDV2).[11] Table 4 reports negative binomial regressions with parameters for these response functions. Model 1 (LDV) replicates Model 4 in Table 2 but drops the two national-level parameters because they create estimation problems as we add additional lagged variables. Model 2 (ADL) introduces additional $t-2$ lag parameters for the focal independent variables. (The independent variables were already lagged once; using unlagged and $t-1$ variables did not change the results.) Except for magazines, Wald tests do not support the inclusion of additional lags. Thus, there is no evidence that the effects of changes in the levels of regulation or populism propagated over time, except through their first-order influence on the dependent variable. To test for higher-order autocorrelation, Model 3 adds an additional $t-2$ lag parameter for the dependent variable (ADLLDV2). These results are consistent with the LDV specification except for magazines.

As noted above, the magazine variable raises additional endogeneity concerns. To deal with them, we estimated Poisson instrumental variable regressions (also known as exponential conditional mean models with endogenous regressors) using a generalized method of moments estimator (Wooldridge, 2010). Model 4 in Table 4 (GMM) replicates Model 4 in Table 2 but drops the lagged dependent variable (LDV) (which complicates the estimation of an instrumental variable) and the two national-level parameters (which introduce estimation problems similar to those encountered with the extended lag specifications). The results are largely unchanged. Model 5 (GMM-IV) uses the instrumental variable (postal roads) to

11 Beck and Katz (2011) suggest using both Lagrange multiplier and Wald tests for model specification. Because these are nonlinear models, we cannot use the Lagrange multiplier test for serial correlation of the errors, but Wald tests remain valid.

Table 4 Additional models of challenger medical colleges

Model	1	2	3	4	5
Model type	LDV	ADL	ADLLDV2	GMM	GMM-IV
No. of colleges	1.099*	1.074***	1.220***		
	(0.536)	(0.155)	(0.218)		
Medicine regulated	−0.280	−0.967*	−0.971*	−0.067	−0.424
	(0.323)	(0.386)	(0.386)	(0.337)	(0.626)
Medicine deregulated	0.329*	0.096	0.084	0.664***	0.688***
	(0.148)	(0.557)	(0.555)	(0.144)	(0.180)
Magazines (%)	2.382***	1.786***	1.695***	3.004***	4.737**
	(0.308)	(0.429)	(0.436)	(0.302)	(1.441)
Populism (%)	0.796	0.820	0.906^{+}	1.050***	1.284***
	(0.525)	(0.506)	(0.525)	(0.276)	(0.385)
No. of colleges, $t-2$			−0.207		
			(0.213)		
Medicine regulated, $t-2$		0.639	0.654		
		(0.450)	(0.450)		
Medicine deregulated, $t-2$		0.164	0.206		
		(0.552)	(0.551)		
Magazines, $t-2$ (%)		0.966*	1.111*		
		(0.446)	(0.450)		
Populism, $t-2$ (%)		0.035	−0.055		
		(0.567)	(0.572)		
No. of colleges (incumbent)	−0.148*	−0.148*	−0.147*	−0.238***	−0.292**
	(0.072)	(0.071)	(0.070)	(0.068)	(0.092)
No. of colleges (other challengers)	−0.312*	−0.318**	−0.340**	−0.910***	−0.934***
	(0.126)	(0.113)	(0.113)	(0.093)	(0.120)
No. of magazines (incumbent)	−0.069+	−0.069*	−0.069*	−0.076*	−0.047
	(0.035)	(0.033)	(0.032)	(0.032)	(0.044)
No. of magazines (all challengers)	0.034	0.040	0.033	0.053	0.038
	(0.049)	(0.047)	(0.047)	(0.040)	(0.046)
State population (millions)	1.237***	1.265***	1.290***	1.810***	1.818***
	(0.228)	(0.202)	(0.208)	(0.198)	(0.231)
State area (100 000 miles^2)	1.603**	1.504**	1.486**	1.654**	1.117
	(0.556)	(0.502)	(0.504)	(0.603)	(1.101)
State urban population (%)	0.599	0.743	0.811	1.875**	2.477*
	(0.551)	(0.518)	(0.519)	(0.608)	(1.185)
No. of colleges (non-medical)	0.073*	0.075*	0.083**	0.225***	0.242***
	(0.036)	(0.033)	(0.032)	(0.030)	(0.040)
Years of statehood	0.069**	0.066***	0.065***	0.075***	0.070***
	(0.021)	(0.018)	(0.018)	(0.017)	(0.019)
Overdispersion	−5.185	−13.971^{+}	−13.392^{+}		
	(35.905)	(8.366)	(6.870)		
Constant	−7.766	−7.603	−8.087	4.075	7.481
	(10.636)	(11.558)	(11.576)	(10.462)	(11.864)
Instrumental variable?	None	None	None	None	Postal roads
Cubic spline parameters?	Yes	Yes	Yes	Yes	Yes

continued

Table 4 *Continued*

Model	1	2	3	4	5
Model type	LDV	ADL	ADLLDV2	GMM	GMM-IV
Regional and group fixed effects?	Yes	Yes	Yes	Yes	Yes
No. of observations	2965	2846	2846	2965	2965
Log-pseudolikelihood	−436.018	−427.522	−426.969		

Notes: Table reports coefficient estimates. Robust standard errors are in parentheses below point estimates. $^{+}P < 0.10$, $^{*}P < 0.05$, $^{**}P < 0.01$ and $^{***}P < 0.001$, two-tailed tests.

reduce endogeneity in the magazine share variable. Again, the results remain largely unchanged. In fact, the coefficient for magazines is larger than in the non-instrumented model. It is not straightforward to estimate Hausman test statistics on these models, but Hausman tests on equivalent GLM models indicate that the IV model is an improvement over the non-IV model.

To test for endogeneity in models of medical deregulation would require a dynamic framework similar to that used in the analysis of medical colleges. Unfortunately, this is not possible because deregulation was a one-time event for each state. Instead, we attempted instead to assess the magnitude and direction of endogeneity bias by examining how the number of challenger-sect colleges and levels of populism predicted selection into the risk set of states regulating medicine. We could not estimate proportional hazard models of regulation because of quasi-complete separation between the independent and dependent variables: not a single state with a challenger-sect college chose to pass regulation, and only one state did so in the same year that it supported a populist candidate (Ohio in 1824). While this result is consistent with selection bias, it also suggests that any such bias should be conservative. Unregulated states with challenger-sect colleges and support for populist candidates should have been at higher risk of deregulation, but they were selected out of the risk set because regulations were either never passed or allowed to lapse into dead-letter law.

6. Discussion and conclusions

We conclude by reviewing our main findings and placing them sociological and historical context. The first concerns the role of scientific/intellectual movements within the system of professions. Mobilization by challenger occupations can overcome the cultural authority of a profession and erode its monopoly power. Challengers succeed when they are able to asset their own cultural authority based on an alternative system of knowledge independent of the dominant profession. In the case of 19th-century medicine, alternative medical sects posed a grave threat to regular physicians' monopoly power, as Abbott (2005) and Whooley (2013) have shown in the case of New York state. But while the epistemic contests described in detail by Whooley (2013) were essential for creating organized alternatives to regular medicine, challenger mobilization efforts did not always culminate in a political campaign for deregulation.

Instead, we found that in many states, a free market for medicine was imposed from above. Our second finding thus concerns the relationship between electoral politics and professional monopolies. In addition to contests between occupations, external political

dynamics could also deprive the medical profession of monopoly power. Populist political campaigns bundled the issue of professional licensing together with a host of other anti-monopoly sentiments (Larson, 1977; Starr, 1982; Burrage, 2006). Where populists received more votes, governments were more likely to overturn institutional protections for regular physicians, which in turn created new opportunities for challenger sects. The populist coalition was not long-lived: it collapsed after just 30 years as the issue of slavery came to displace nearly all other political concerns. But while it existed, it set the American medical profession on a unique historical trajectory, and its continued effects can be seen in the development of the medical profession to the present day.

After the Civil War, rivalries between medical sects cooled and gave way to tentative rapprochements. Regular physicians, homeopaths and eclectics increasingly made common cause in search of institutional protection. These three sects lobbied together for new regulations, and in nearly every state, they won licensing boards for each sect, or even a single board with separate examinations (Rothstein, 1972, pp. 307–310; Starr, 1982, pp. 102–108). Such collaboration was in flagrant disregard for the AMA's code of ethics, which was accordingly modified in 1903 to eliminate the ban on consultation with members of other sects (Rothstein, 1972, pp. 314–316). But the oligopoly of regular, homeopathic and eclectic doctors never became strong enough to prevent the emergence of new challenger occupations. At the turn of the century chiropractors, osteopaths and Christian Scientists followed the path laid down earlier by eclectics, homeopaths and physio-medicalists (Starr, 1982, pp. 108–109).

In the long term, every medical sect was vulnerable to challenges from new laboratory and hospital specialties imported from Europe. The discovery of the germ theory of disease and the medical revolution it sparked did not immediately benefit any sect in particular. Regular physicians, homeopaths, eclectics and physio-medicalists all laid claim to vaccination, antisepsis and other techniques (Rothstein, 1972, pp. 258–260, 278; Whooley, 2013, pp. 148–182). But the poor conditions of many small proprietary colleges made it increasingly difficult to keep up with increasingly stringent licensing requirements and standards of education. The number of colleges peaked across all sects around 1900, with 160 regular colleges, 22 homeopathic colleges, 9 eclectic and 2 physio-medical. By 1920, however, closures and mergers had reduced their numbers to 95 regular colleges, 6 homeopathic colleges and a single eclectic college (Starr, 1982, pp. 107–120). The result was a narrow and powerful medical profession supplemented by a host of subordinate professions—dentists, pharmacists, nurses, laboratory technicians and others—alongside a vibrant alternative medical sector largely outside the dominant profession's control.

Today, in light of populist resurgences in Europe and the USA, populist anti-professionalism cannot be regarded as a mere historical oddity (Ingelhart and Norris, 2016; Müller, 2016; Mudde and Kaltwasser, 2017). As we have shown, when occupational struggles and party politics become linked, they can transform markets for professional services. These factors need not develop through the same causal sequence: in the case of 19th-century medicine, populism had no direct effect on the cultural authority of challenger sects, nor did challenger-sect mobilization directly influence deregulation. But as the cultural authority of challenger sects and political debates over professional monopolies developed in tandem, their effects converged, producing a sustained nation-wide campaign that eroded regular physicians' monopoly over the market for medical services and created an open market for medical care. Under such circumstances, the power of professions can seem fragile indeed.

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