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# State promotion of local public goods: The case of public libraries, 1880-1929

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**ABSTRACT:** The public library movement of the late nineteenth and early twentieth centuries led to a significant expansion of library services across the United States. We study the impact of state-level institutional development on the creation of local public goods. State library commissions were modestly funded state entities charged with helping localities establish libraries. State library associations were voluntary organizations with a similar mission, having as members the librarians of existing public libraries. Library-enabling legislation clarified the legality and taxation possibilities for local government entities such as towns, municipalities and counties to support libraries. Employing panel data drawn from a series of detailed reports on public libraries conducted by the U.S. Bureau of Education, we use a difference-in-differences methodology to identify the impact of commissions, associations, and enabling legislation on library development in matched pairs of counties that straddle state borders. Our results suggest that state-level institutions and legislation had a statistically and economically significant effect on public library development. The finding has implications for future interpretations of the history of the United States as a “nation of joiners”; local civic engagement and associational life was importantly influenced by larger scale civic and political action.

JEL classifications: H40, H75, N31, N32, N41, N42

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## **1. Introduction**

In the United States and elsewhere, a wide variety of services are provided by local government. Towns, municipalities, districts, counties, and their instrumentalities provide primary and secondary education, transportation services, water and sewage treatment, hospitals, public health services, auditoriums and stadiums, ports and airports, roads, parking facilities, lighting of public spaces and roadways, natural gas and electricity distribution, communication services, recreational facilities, and other cultural and educational and cultural institutions, such as libraries. The economic rationale for government provision may rest on these services having the character of local public goods, or in preventing local monopolies from extracting consumer surplus.

The historical processes whereby local governments in the United States initiated, developed, and financed these forays into the provision of local public goods in the nineteenth and early twentieth centuries have been the subject of a large literature. Local public goods were normal goods, and their demand increased with the growth of per capita incomes during this period. In addition, local provision depended on the mobilization of political support and social capital in local communities. As Goldin and Katz noted in their study of the high-school movement, “small towns and villages were reservoirs of social capital.” Social institutions that generated trust were likely to have been strong correlates of the provision of local public goods. When citizens or residents of municipalities or other local government entities came together to decide to provide for public services (and monitor the effectiveness of the provision of services), they were probably more likely to be engaged when they had stronger generalized trust. Instead of providing services for strangers, they were approving services for “us” in some form.<sup>1</sup>

Of course, a variety of other political factors entered into the mix. Ideology played a part in the early days, as for example “sewer socialists” in Wisconsin drew on German experiences to implement expansion of municipal services. As the Midwest developed, towns saw themselves in competition for population and used publicly provided amenities to attract and retain higher-income residents. Single-issue interest groups, such as bicyclists and flying enthusiasts, used local political processes to secure “club goods” for their recreational pastimes.<sup>2</sup>

In addition to these local factors, we argue, state and regional networks of advocates and professionals played a significant and underappreciated role by providing information and resources to local actors as well as by promulgating state legislation that enabled local taxation and expenditure. These state or regional entities themselves were established because of dense networks and significant social capital. They enabled local institutions to be effective. The period after the end of the Civil War in the United States saw an enormous increase in formation of local associations. Women’s clubs, in particular, seem to have had sizable responsibility for the success of the reform agenda of the progressive movement because they operated at both scales, the local and the regional. Their federation at the state and national level may have been a key factor in their influence. Their efforts at social betterment eventually resulted in widespread statewide

prohibitions of tobacco smoking and (eventually nationwide) alcohol consumption. Other regional organizations also shaped the social reform agenda; state-level leagues of cities for example did much to improve local government and provision of public goods.<sup>3</sup>

Historians have increasingly applied quantitative methods to examine hypotheses and uncover patterns in the local provision of public goods and the role of political institutions and social structures. Some papers focus on the determinants of expenditures, others on their impacts. For example, Chapman used evidence on local expenditures in England between 1867 and 1900 on roads, sewage, lighting, and other public goods to argue that local rules regarding the franchise had sizable effects on the levels of expenditures. Poorer and wealthier residents were typically more opposed to public expenditures, and middle classes more in favor. Dittmar and Meisenzahl analyzed data on the rise of public schools in German cities during the Reformation. Using an instrumental variable approach, with plague exposure in the early 1500s as an exogenous shock that enabled reformers to more easily acquire local political control and implement public schooling (among other reforms), they show that public provision of schooling appeared to have long-lasting effects in attracting population to towns and in producing above-average “talent” that made significant contributions to German society.<sup>4</sup>

In this paper, we analyze the rise and spread of a venerable and widespread local public service in the United States, the public library. We focus on the role of state-level actors in promoting local library development. We show that, regardless of local community characteristics that may have been conducive to establishing public libraries, the coordination and promotion of library development by state governments and non-profit organizations played a key role in the expansion of library services across the country.

State-level efforts at library promotion were closely tied to networks of library advocates, women’s organizations, and professionals. Librarians at existing libraries formed state library associations, whose primary goal in the early years was to advocate for and enable the establishment of more public libraries in the state. Associations would lobby government, support applications for Carnegie libraries, and complement the work of state library commissions. Likewise, many states established state library commissions with the express mission of aiding local communities to establish and operate libraries effectively. These associations and commissions were formed in the years after 1889-90, when a number of states (including New Hampshire, Iowa, Mass., Ohio, New York, and New Jersey) established library associations.

Library-enabling legislation clarified the legality and taxation possibilities for local government entities such as towns, municipalities and counties to support libraries. Many of the enabling laws were simple declarations that towns and cities could establish libraries, with little specificity as to the modalities of taxation or governance. A turning point came in 1872, with passage of the Illinois library act. The burgeoning public library movement hailed the act as model library enabling legislation for other states. The act authorized towns and cities to establish public libraries, and specified a prescribed tax rate, a process by which citizens could obligate the governing authority to act (i.e. through a petition or referendum), and a specification that the public library be governed by elected or appointed trustees. By 1875, twelve states had basic enabling legislation. Others followed, and legislation was repeatedly amended to expand the scope of permissible local action.<sup>5</sup>

The impact of these efforts at the state level to promote libraries was thought to be practically self-evident. Commission and association reports routinely attributed library expansion to the work of the commission staff and association leadership. But there appear to have been some states where associations, commissions, and enabling legislation had little impact on the trajectory of public library establishment. Goldstein was not alone in observing that: "Iowa showed little interest in public libraries for most of the second half of the nineteenth century. In 1890 there were still only ten tax-supported public libraries, despite the passage of enabling legislation twenty years earlier." Critical voices were heard on occasion, especially when it came time for annual appropriations for commissions, and when associations had to raise membership dues to support services. Moreover, given that the trend towards public libraries was already well-established, it is not clear whether the commissions and associations had a significant causal impact. The associations, commissions and enabling legislation may have merely "crowned" an existing trajectory.<sup>6</sup>

To assess the causal impact of state library associations, commissions, and enabling legislation on local library development, we analyze county-level data on libraries drawn from comprehensive library surveys conducted by the U.S. Dept. of Education between 1875 and 1929. Our identification strategy relies on matching adjacent counties across state boundaries to compare measures of library development between treatment and control counties when one state's institutions changed. Using county-level census data, we also control for some other local characteristics that could be expected to influence library development, including demographics and urbanization. Our results, using a sample of counties on borders between states, suggest that state-level institutions and laws had a sizable and statistically significant positive impact on local public library development.

In section 2 we review the history of public library development in the United States and summarize some of the causal factors often cited as accounting for that development. Section 3 provides an historical overview of the role of state library associations, commissions and enabling legislation in promoting local public libraries. Section 4 describes the sources for the data on public libraries. Section 5 explains our identification strategy for the econometrics. Section 6 provides the econometric results, and the final section concludes.

## **2. Spread of public libraries in the United States**

The period 1870-1929 witnessed a rapid increase in the number of public libraries in towns and cities across the United States. Communities agreed to tax themselves to support this emerging public good. Civic leaders, philanthropists, and library boosters were part of a broad social movement advocating for improvement through education and reading. Women's clubs and their state and national federations were key advocates for libraries. The library movement was greatly aided by wealthy library boosters, most famously steel magnate Andrew Carnegie, whose philanthropy funded the building of libraries in nearly 1700 communities between 1890 and 1920.<sup>7</sup>

Initially, libraries were the province of voluntary, associative institutions. After the establishment of the Boston Public Library in 1848, however, libraries were increasingly constituted as quasi-governmental entities, funded from tax revenues. Local government, in particular, assumed the role of funding librarian salaries, maintaining buildings, developing book collections, training librarians, and initiating reading programs. Library collections and access

were, to some extent, a local public good, and thus it was perhaps not surprising that there were advocates for them to be funded from local tax revenues. Indeed, Carnegie's "wholesale" library philanthropy insisted that local government commit to levying taxes to support the library buildings that he would fund.

Figure 1 plots the number of associational and public libraries and Carnegie libraries for the period 1870-1929, along with the number of daily newspapers for comparison. We use the number of newspapers as a robustness check to confirm that the effects of institutional changes primarily affected the supplying of public libraries, rather than the general demand for information and reading. The underlying data, discussed in more detail below, are derived from Bureau of Education library survey reports, for different thresholds of library size. The figure shows that the number of public libraries grew steadily and rapidly over the 60 year period, going from just under 1,000 in the country to about 4000 established by 1929. That amounts to about 50 new libraries every year, for the country. After 1900, many of these libraries were sponsored by Carnegie's philanthropy (though a good deal of the Carnegie libraries consolidated existing small associational libraries or existing public libraries). The number of daily newspapers likewise grew steadily from 1870 to 1905, but then leveled off, with no growth through 1930.<sup>8</sup>

The spread of public libraries was uneven, however, because local conditions affecting the demand and supply of libraries varied considerably. Not all constituencies agreed that libraries were good civic investments. Most communities in the South, for example, did not establish public libraries until the 1930s. Many communities in other parts of the country rejected offers from philanthropists to establish libraries that would then be operated by the town or municipality. Opposition to Carnegie grants for libraries, for instance, was fierce in some towns, where the philanthropy was seen as tainted by the violent repression of the Homestead Mill strike of 1892. Other communities felt their towns had more urgent priorities and balked at the longer-term fiscal implications of maintenance of libraries.<sup>9</sup>

Figures 2 and 3 show the growth in public libraries and Carnegie libraries by region. The Northeast led the way in the establishment of public libraries, having a library in practically every county by the end of the period. The Midwest grew more rapidly over the period, and took great advantage of Carnegie largesse. The South lagged behind the rest of the country. As discussed below, many southern towns refused Carnegie offers even after town leaders requested grants, and many more towns simply refused to request Carnegie funding.

The expansion of public libraries in the United States during the late nineteenth and early twentieth centuries remains a subject of considerable interest for historians of literacy, reading, education and economic growth. There has been little quantitative research on the underlying factors explaining the spread of libraries over time and across regions. Kevane and Sundstrom, building on the work of Williams, estimated panel regressions at the state level using state-year data and found that public library presence, as measured by number of libraries and volumes per capita, was positively associated with the number of towns in the state above a population threshold of 2500, with the presence of state library commissions and associations, and with the proportion of the population that was foreign-born. A significant positive time trend in library development remained even after controlling for socio-economic changes and the explanatory variables did not account for the significant lag in public library development in the South relative to the rest of the country.<sup>10</sup>

### **3. Library associations, commissions and enabling legislation**

The timing of the expansion of public libraries coincided closely with the formation of state library associations, commissions, and library enabling legislation. Library associations were voluntary organizations, having as members the librarians of existing public libraries. Established by legislation, library commissions were state entities charged with helping localities establish libraries. Many association officers were clear that a primary purpose of the association was to lobby the state legislature to establish a state library commission. This means, of course, that to some extent these entities were endogenous outgrowths of the spread of local public libraries and allied interest groups.

Stauffer summarizes the typical rationale for state employment of library organizers through a state commission:

States with many small, isolated community libraries recognized the need for providing them with professional encouragement, advice, and leadership. To achieve these goals they hired state library organizers, whose duties were to visit each community in the state, assess local conditions, evaluate local library practice, provide advice and assistance, advise on improvements to facilities and equipment, aid in Carnegie grant applications, arouse local support for the library, and make recommendations to the appropriate state agency regarding funding and future library construction and expansion.<sup>11</sup>

Very often a state commission would hire one or two library organizers, who travelled throughout the state helping local civic groups and government to establish libraries. Organizers might visit hundreds of communities in a single year, holding town meetings and working with town leaders to organize libraries. Sometimes legislation mandated that commissions support libraries with one-time or annual allocations. For some states, these were \$100 or \$300 grants made by the commission.

Civic groups understood that state employees would be much more likely to follow through on developing libraries than volunteer organizations. In Iowa, for example, the Iowa Federation of Women's Clubs was a prime mover in pressing the state legislature for the establishment of a state library commission to promote local library development and librarian training. Writing about Alabama, White opined that, "Without an effective state library program in place and lacking public support, communities experienced great difficulty in gathering information necessary for participation in the Carnegie program."<sup>12</sup>

Commission laws were sometimes contested quite bitterly, and library advocates campaigned and strategized for years to secure passage. Sometimes the legislature would humor the civic activists who lobbied for a state commission by passing a law establishing a commission, but then not appropriate any funding for the commission. Such was the case in West Virginia, according to the brief history provided by Julian. At the turn of the century, in 1900, the state only had one public library in Wheeling. Over the next decade Carnegie approved eight grants for libraries, but only four were ultimately approved by voters. Voters rejected grants, with their conditions of the 10% annual maintenance fee and town-provided building site, in four towns. By 1914, there were only 12 public libraries for the entire state. The West Virginia Library Association was created that year, as a complement to the existing activities of the state Federation of Women's

Clubs. The association and Federation intended to lobby the state for a commission, but were not successful until 1929, and no funds were appropriated until 1941. Public libraries did not extend throughout the state until the 1970s.<sup>13</sup>

Even in the Midwest, clearly a bastion of supporters of public libraries, there was considerable opposition to involvement of state government. A bill in Minnesota to establish a library commission failed in 1897. Harrison observed that:

The bill was indefinitely postponed by of the legislature on Feb 18. It was recommended for passage in the senate but opposed in the house by Representative Ignatius Donnelly. His remarks on the bill—from one point of view—are of interest. In speaking against it he said, in substance: “It is not within the province of the legislature to supply the people with books any more than it is with boots. Books are not read in single day nor a single week. One member of the family does not peruse them and then return them. They are read by every member. Circulation under such circumstances is a slow process... The whole thing is really a scheme by some dealer to job off a lot of books.” He closed with a peroration warning his hearers that the \$5000 appropriation was intended “as a levy to pry a hole in the barrier, and in the sacred name of intelligence and education to let in a flood of extravagance upon the treasury.”<sup>14</sup>

To document the spread of state commissions and associations and assess their impact, we have coded their establishment dates based on a variety of sources listed in the references. Sometimes the founding date is not clear, since some states would establish a library unit within the Board of Education, or the Division of Museums and Archives, to handle public libraries. We have generally coded the earliest establishment of a separate division with a clear mission to promote public libraries (thus we do not code the year of establishment of what was known as the State Library, which rarely concerned itself with promoting public libraries at an institutional level, though state librarians were often very active).

Figure 4 displays the evolution of the establishment of library associations over time, and Figure 5 displays the evolution of the establishment of library commissions over time. Both are broken down by region. By 1900, a considerable majority of states in the Northeast and Midwest had established library associations and/or commissions. Development in the South and West lagged by about 10-15 years, although of course many of the western states were sparsely populated prior to the closing of the frontier.

Until about 1850, many civic leaders believed there was no clear legal authority for a town or city to use taxpayer money (other than penal fines) to establish and maintain a public library. Some towns of course ignored the fact that they had no clear authority, such as the town of Peterborough, New Hampshire that in 1833 was apparently the first town to use tax monies to support a public library. The Boston Public Library, established in 1848, was the first city library supported by tax revenues, and was enabled by an earlier 1848 resolution of the state legislature. In 1849, New Hampshire generalized the Boston legislation to the entire state, and Massachusetts followed suit in 1851. The drafters of these early state laws were aware of developments in England, where in 1850 Parliament passed the Public Libraries Act 1850 which gave local boroughs with populations over 10,000 the authority to establish public libraries by raising a half-penny tax



(later raised in 1858 to a full penny) provided the tax was approved by two-thirds majority in a referendum.

Other New England states soon passed basic legislation authorizing towns and cities to establish libraries, though without great precision as to the modalities of taxation or governance. Many of the enabling laws were simple declarations that towns and cities could establish libraries, with little specificity.

The 1872 Illinois library act was hailed as model library enabling legislation for other states. The act authorized towns and cities to establish public libraries, and specified three important elements: a prescribed tax rate (usually expressed as a maximum rate of, for example, ½ or 1 mill on the value of assessed property); a process by which citizens of a locality could obligate the governing authority to act (i.e. through a petition or referendum); and a specification that the public library should be governed by elected (occasionally, for villages and townships) or appointed (more frequently, especially for towns and cities) trustees forming an independent library board. Interestingly, the act apparently only passed because of the Chicago fire of 1871. The fire burned down a good part of the city, and destroyed world-renowned private and social libraries in Chicago. As Chicago rebuilt, pressure grew to reestablish the civic institutions that had been lost, and representatives from Chicago in the state legislature joined the small town and city library boosters in supporting the public library model.<sup>15</sup>

Subsequent legislation in other states often copied the Illinois act. But there were modifications that emerged. Some legislation included provisions that library taxes had to be approved by referenda, that a state library commission, if it existed, support newly established libraries with purchases of books (often by mandating specific sums, such as \$100 per library per year), and (much later) that the locality could issue bonds to support library construction. By 1875 or so, twelve states had basic enabling legislation. In 1877 and 1878, early leaders of the public library movement Melvil Dewey and William Poole tussled over whether American Library Association should sponsor model legislation. The establishment of state library commissions after 1890 marked a new level of state activism in promoting and regulating public libraries. By then a consensus had emerged among library professionals, and the United States Bureau of Education in the 1903 Bulletin listed key provisions the library legislation should address: encouraging local petitions for libraries; mandating votes on taxation after a petition; providing for a governance structure by having a separate appointed board of trustees to manage the library; and establishing a state library commission.<sup>16</sup>

Despite the consensus, some states lagged behind others. Pennsylvania was one such straggler, in the estimation of *The Library Journal*, which noted in 1901:

The most important matter discussed and settled by the commission was the proposed library law for Pennsylvania, which was later introduced into the legislature, which cannot fail to have a most important bearing on library development in the state, when it is passed. At the present time, excepting an act of legislature passed in 1895 affecting only cities of the first class (that is to say Philadelphia) and an act enabling school boards to give subsidies to libraries, there is no library legislation in the state. It is hoped that by the end of the session this evil may be mitigated. Only one library has been established under the school board

enabling act, and the bill now being introduced will cover all cities and boroughs other than cities of the first class.<sup>17</sup>

After the turn of the century, many states turned their attention to provision of library services in rural areas. Counties, rather than municipalities, were favored to deliver rural library services. Ohio in 1898 passed comprehensive legislation enabling counties to establish libraries, with California following in 1909. Many other states then adopted county enabling legislation.<sup>18</sup>

We have constructed a dataset of library enabling legislation that tracks library-enabling statutes on a number of dimensions. These consist of the four elements: (1) whether there was an explicit legal basis for taxation for public libraries, however general; (2) whether the modalities of taxation were specified; (3) whether there was a specified process for establishing a local public library; and (4) whether there was an explicit prescription for the form of local governance of public libraries.

We aggregate these various measures simply by counting how many of the following a state had in a given year, giving them equal weight, resulting in an index that ranges from 0 to 5:

- evidence of a library enabling law of any kind, or evidence of local taxation for libraries, implying state permission;
- provision for petition to establish library;
- provision for vote to establish library;
- provision for appointment or election of local library board;
- provision allowing issuance of bonds to finance library.

A larger value of the index indicates greater “development” or clarity of the law in the sense of greater specificity. We construct this enabling index for legislation relevant to municipalities (town/city) and separately for the county-level legislation. During our period, most of the focus in the development of local public libraries was at the city or town level of government; after 1910, counties became more crucial as the unit of government responsible for public libraries.

Figures 6 and 7 summarize the evolution of this index of enabling legislation over time, where we have aggregated the states into regions, and present the average index by region, for municipalities and for counties. Once again the pattern is clear, with the South lagging behind the other regions.

#### **4. Data on libraries**

To study the impact of state library promotion on public library development, we also require panel data on public libraries themselves. To track and analyze the spread of public libraries after 1870, we have assembled and coded data on individual libraries from special reports on libraries issued intermittently by the U.S. Bureau of Education. These reports included extensive tables of information on individual libraries gathered from surveys conducted by the Bureau. The surveys covered in our full data set were conducted in 1875, 1885, 1891, 1896, 1900, 1903, 1908, 1913, 1923, and 1929. Information on the founding dates of libraries permits us to identify the exact timing of library development in a large number of communities. Reports for different years use different minimum size thresholds for publishing individual library data. The reports for 1875 and 1885 list all libraries with 300 or more volumes; the reports of 1891, 1896, 1900, and 1903 use a threshold of 1,000 volumes; 1923 and 1929 a threshold of 3,000 volumes; and 1908 and 1913 a threshold of 5,000 volumes.

Our interest here is in public libraries as institutions operating under the aegis of local governmental authority and with local government funding. The earlier federal library reports covered public libraries of this nature, but also a range of non-profit, non-governmental local libraries, including a large number of association and “social” libraries, run for example by women’s reading societies or fraternal organizations. We have used various criteria to classify the libraries consistently across the surveys and identify those that appear to be properly public in the desired sense.

For the 1875-1908 surveys, the library reports typically classified what were clearly local public libraries as “public” or “general” libraries, and our classification usually counts these as public. We exclude from the public classification, however, libraries with names that clearly indicated they were not local public libraries but rather associated with some other kind of organization (e.g., “XX Botanical Garden Library”). In addition, our definition counts as public some other libraries that were classified in other categories but had names that clearly indicated that they served as a community’s or municipality’s public or “free” library. This would include such library names as “XX Public Library” or “YY City Library”. Although in some years the surveys asked whether the library’s services were free or by subscription, and such information would be helpful in classifying libraries as public, a large number of libraries failed to respond to this question, and thus we cannot rely on the responses.

Starting in 1913, the classification scheme used in the federal reports changed rather dramatically, shifting from a classification based on type of parent organization to “level of control,” such as local government, state government, or some non-governmental entity. For the 1913-1929 surveys, our definition of public libraries includes those libraries controlled by local governments, plus libraries run by non-governmental entities with “public”-sounding names, as above.

Finally, we add Carnegie libraries that were reported by Bobinski but not reported in any of our U.S. library surveys (probably because they were too small to meet the volume threshold). We use the date of the Carnegie grant as the founding date for these added Carnegie libraries.

The library surveys were conducted intermittently, but we can generate a complete panel of libraries by year using the reported founding dates of the individual libraries, which were recorded in all but one (1923) of the library survey reports. Not all the libraries reported their founding dates, so where possible we match libraries across survey years and impute missing founding dates using the founding date of a public library in the same town from the nearest (in time) available survey year. The completeness of this variable varies across survey years, but overall we can determine founding dates for a large majority (nearly 97%) of our libraries.

We assume that any given town had at most one public library (multiple branches notwithstanding), and assign the earliest founding date for any public library in that town as the “birthdate” of the town’s library. We also assume that any library reported in a survey survived throughout our analysis period, even if it is not reported in a subsequent survey. Therefore, by construction, the number of communities reporting public libraries is constrained not to decrease over time. This accords with our extensive reading of the library history literature; during the 1870-1929 period library closings appear to be quite rare. There are likely many reasons why libraries responding to earlier surveys did not respond to the later surveys, including simple oversights.

Because the volume threshold for reporting in the federal surveys generally increased over time, the reported samples become more selective over time, generating a bias against finding library growth for this count of libraries. Although this inconsistency is clearly a problem for measuring aggregate library development, our difference-in-differences estimation procedure includes a full set of time dummies for each county pair. Thus any common trends due to changes in reporting criteria are differenced out.

## **5. Using adjacent counties across state borders to estimate causal effects**

The impact of state library commissions and associations and enabling legislation is difficult to measure. These institutions were created, and laws passed, precisely because of a pre-existing growing interest in establishing public libraries. Therefore, the correlation between the founding of state-level institutions and founding of public libraries in localities may not be a causal relationship, or the causality could run the other way.

We identify the causal effect of state-level institutions and laws by relying on the fact that the purpose of these state institutions and laws was to promote libraries within the state, and so their work "stopped" at the state border. Communities on the other side of state borders benefitted only indirectly if at all from the organizational efforts and expertise available from commission and association activities. Likewise, enabling legislation was not applicable to towns across the border. We use a difference-in-differences framework that exploits time-varying differences in institutions between states for pairs of contiguous counties straddling state borders. Identification of the association and commission and enabling legislation effects is based on variation in library development over time within the county pair, controlling for the common time path for the pair, along with persistent county traits that affected library-proneness (county fixed effects).

The approach is similar in spirit to the well-known work on minimum wage effects by Card and Krueger, and we implement a version of the county-pair strategy used by in a more recent study of minimum wage effects by Dube et al., who found negligible unemployment and significant income effects of the minimum wage.<sup>19</sup>

The method has become increasingly common. Naidu used the method to estimate the effects of state-level disenfranchisement of African-American voters on land values and inputs to local schooling in states in the South. He confirmed that disenfranchisement raised property values for landowners and lowered public goods serving blacks, while leaving whites' public goods (schooling inputs) unchanged. Huang applied the same method to estimate the effects of state-level deregulation of restrictions on branch banking. He found there to be no effects of branch banking deregulation on subsequent economic growth. Similarly, Scholl estimated the effects of graduated drivers licenses on teen deaths in auto accidents. By using adjacent counties that straddle state borders, Scholl constructed a much better control group for teen driver conditions (especially for metro areas, where driving conditions on either side of the border were likely to be very similar and to be changing over time in similar ways). The county-border strategy enabled estimation with much more confidence of the large effects of graduated driver's licenses in reducing fatalities for teens in car crashes. More recently, Murphy and Artz have estimated the effects of indicators of economic freedom and the ease of doing business at the state level on a number of outcomes, using cross-border counties as controls.<sup>20</sup>

The key identifying assumption is that within the contiguous county pairs that straddle state borders, differences in the state library institutions between the two counties are uncorrelated with differences in the underlying socio-economic factors that drove local civic decisions to undertake the establishment of libraries, for either county in the pair. The assumption would be invalid if contiguous counties across borders had different civic processes regarding library political economy, and those processes were also significant determinants of state-level processes resulting in the formation of library associations and commissions and passage of enabling legislation. While it is undoubtedly true that the formation of state associations, commissions, and legislation reflected to some extent an aggregation of local county processes, we believe that state-capital level politics and national trends, as well as idiosyncratic capabilities for leadership in state government and bureaucracies, were likely the more important driving factors. A simpler way to put it is that when it comes to the observed and unobserved factors leading to local public library development, the typical border county was much more similar to its neighbor across the state line than it was to the large number of interior or cross-state counties that likely influenced state-level initiatives.

The unit of observation in our data is a cross-state-border county pair in a given year, with both counties in the pair appearing as separate observations each year. Moving from the panel of libraries to the panel of county pairs requires several steps. We first match library place names (and states) to modern (1990) counties using the place name list from Federal Information Processing Standards (FIPS) 55. We assume that each place (town or city) reporting a library had at most one public library at any point in time. Our key dependent variable, then, is a count of the number of towns with public libraries in the county in any given year, which can be interpreted as the number of distinct places in the county that had access to public library services in that year. We then use shape files downloaded from the Newberry Library and maps from Thorndale and Dollarhide to identify pairs of contiguous (touching) counties straddling state borders.<sup>21</sup>

Matching library places to modern county definitions raises the challenge of consistency over time. During the period of study, county definitions and borders were changing, especially in the more recently settled states of the Midwest and West. Counties were thus not consistently defined from year to year, and it is possible that a town assigned to a current county was actually in a different (typically neighboring) county in the past. If it was, then any covariates assigned to the county from historical Census reports would erroneously assign the wrong data for that town.

We deal with the challenge of consistent county definition in two alternative ways. The first is simply to use modern border definitions for all border counties in all years. Under the plausible assumption that library towns did not physically move (much) in the past, this procedure amounts to attributing the library to a stable geographic region or spatial polygon (the modern county), and comparing that region with another stable region across the state border that may or may not have had towns with libraries. Under this assumption, we cannot control for county covariates based on Census reports for historical counties. Given the very rich set of fixed effects used in our analysis (border pair-by-year as well as county), however, this limitation is less problematic than it might at first appear. Our second approach is to restrict our sample to counties that had their modern county borders over the entire panel. Identification of counties with stable borders is accomplished using the County Longitudinal Template.<sup>22</sup>

These approaches lead us to our two core estimating samples: a balanced panel of all border county pairs, imposing modern county definitions, for the entire period of our data (1870-1929); and a balanced 1880-1929 panel of county border pairs restricted to pairs in which both counties had achieved their modern borders by 1880 (consistent counties). Using the latter sample, we run specifications with and without Census covariates. The period 1880-1929 covers the period during which the large majority of states introduced both library commissions and library associations, and by starting the consistent panel in 1880 we pick up a number of counties that achieved their modern borders during the 1870s. Figure 8 maps the border counties used in the all-county sample, indicating which counties had at least one public library for 20-year intervals, starting in 1870.

Each county can enter our data set more than once, because most border counties touch more than one county across the state line. Consider, for example, the case of the Allen County, IN, and adjacent Defiance County, OH. These two counties are in the following five observations in the data: Allen, IN-Defiance, OH; Allen, IN-Paulding, OH; Allen, IN-Van Wert, OH; Defiance, OH-Allen, IN; Defiance, OH-De Kalb, IN.

The full sample of all counties included a total of 1142 border counties, of which 217 (19%) were paired with only one other county, 515 with two other counties, and the remainder paired with more than two, for a total of 1381 distinct border pairs. The more restrictive panel of consistent counties is smaller but shows a roughly similar pattern, with a sizable majority of counties paired with more than one cross-border partner.

Our three time-varying institutional treatment variables are the county's years of exposure to the state library commission, to its association, and to any state library enabling law. These variables take the value 0 up to the year the commission or association was formed or the first enabling law was enacted, and increase by 1 each year thereafter. This formulation of the treatment assumes that the impact of an institution was to change the rate of library development in the state, *ceteris paribus*.

For the consistent-border sample regressions, we also add time-varying county-specific demographic control variables drawn from U.S. Census data. Because these controls come from decadal data, we interpolate between census years using cubic spline interpolation. Obviously such controls cannot pick up fine-grained changes from year to year, and thus at best may capture differences in broad demographic trends between counties within a cross-border pair.<sup>23</sup>

To summarize, we regress the library dependent variable against the time-varying state library association, commission, and/or enabling legislation variables, other time-varying covariates (if included), county fixed effects, and a fully saturated set of fixed effects for cross-border county pairs by year:

$$y_{ipt} = \alpha + \beta L_{it} + \gamma X_{it} + \phi_i + \tau_{pt} + \varepsilon_{ipt} \quad (1)$$

where  $y_{ipt}$  is the library outcome variable in county  $i$  for pair  $p$  and year  $t$ ;  $L_{it}$  is the "treatment" variable (library institution or legislation) in county  $i$  and year  $t$ ;  $X_{it}$  vector of county-time-varying controls (used in some specifications);  $\phi_i$  is a county fixed effect;  $\tau_{pt}$  is a pair-specific time effect; and  $\varepsilon_{ipt}$  is the error term. Note that it is possible to identify both the county and pair-specific fixed effects, because each county can enter the sample more than once. In all specifications we cluster standard errors at the county level.

The coefficient  $\beta$  for each treatment is the key estimate of interest and can be interpreted as the increase in the rate of library development per year as a result of an association, commission, or law being present in the state.

One shortcoming of our specification is that it fails to take into account potential spatial autocorrelation or cross-county spillover effects of library development between neighboring counties. In principle, such spillover effects could be negative or positive. If people in one county could travel to and use libraries in neighboring counties, then the neighboring county libraries would serve as a substitute and potentially suppress local library development. On the other hand, a positive spillover effect could arise if libraries in neighboring counties had a demonstration effect or induced inter-county rivalry. We view the former negative effect as unlikely. First, local public libraries were generally community-based institutions intended for the use of local residents. Second, during a period largely predating mass automobile availability, it seems implausible that residents of large rural counties would incur the travel costs necessary to cross the state line for a book. If our intuition is correct and the spatial correlation is (if anything) positive, this can only dampen the estimated impact of state library institutions within our county pairs, thus biasing our results against finding any effect. In future work, we plan to use data from adjacent within-state counties to estimate the spillover effects more directly.

## 6. Results

Table 1 provides basic summary statistics for our data, for three years over the period, 1884, 1900 and 1916 (these are Presidential election years for which the newspaper data is available). The first group of columns provides the mean and standard deviation for the counties that are not on the state border, and the second group for the counties that are located on state borders. The statistical significance of an ordinary t-test for difference in means between the two groups of counties is indicated by the asterisks. These asterisks do not reflect an interest in testing any formal hypotheses, but are merely intended to flag differences that are large relative to cross-county variation. The border counties might consist disproportionately of states with many border counties and fewer interior counties, and so comparing the differences is not that instructive.

In 1884 about 30% of border counties had places with public libraries, with .98 such places in each county. The prevalence of libraries rose to 38% in 1900 and 48% in 1916. Likewise, the presence of Carnegie libraries rose from zero in 1884 to 32% of border counties having a Carnegie library in 1916. In 1884 about half of counties had a newspaper, and their prevalence rose to about 80% of counties having newspapers by 1916. Population on average increased by about 50% over the three decades. The percent of the population living in urban places (above 2,500 and 25,000) doubled over the period. The percent female, non-white and foreign-born were fairly constant over the time period.

Table 2 presents a summary assessment of whether the core assumption of the county border econometric strategy is reasonable. The assumption behind the strategy of using cross-border counties as controls is that a border county is more similar, in many respects, to adjacent cross-border counties than to other counties in its own state that are farther away. This assumption can be tested by comparing cross-county differences in observable characteristics. Table 2 presents such calculations for seven demographic variables (total population, percent of population in towns greater than 2,500, percent of population in towns greater than 25,000,

percent female, percent non-white, percent foreign-born, and percent Catholic). For each variable, we calculate two differences (in absolute value): the difference between the value for the border county and the mean of the variable for all other counties in the state; and the difference between the border county and one adjacent county across the state border. (Many border counties have more than one adjacent cross-border county, and we calculate a cross-border difference for each pairing.) We then calculate the percent difference between these two differences, and average this difference in differences across all border counties in the four regions of the United States. If border counties are more different from other in-state counties than they are from adjacent cross-border counties, the mean percent difference will be positive. If border counties are more similar to in-state counties, the mean percent difference will be negative.

Table 2 makes it clear that for nearly all the variables in all the regions, the within-state differences are greater than the cross-border differences. That is, the adjacent cross-border counties are almost always more similar. This result is not due to the magnitudes of the differences, which might be skewed, with some large in-state differences affecting the mean difference. The vast majority of differences at the county level are smaller across state borders compared with the in-state differences. The mean percentage differences are large. In 1884, for the variable measuring the total population of the county, the mean difference between a border county and the mean county in-state was 222% greater than the difference between a border county and its adjacent cross-border county for counties in the Northeast, and even greater for other regions. Negative values are only seen in the percent urban variables. This makes sense. If a border county has a large urban place, it is less likely (although occasionally true) that the adjacent county will also have a large urban place, since urban places tend to be geographically dispersed. The differences for percent non-white are especially large for the Midwest and South, reflecting the geographic concentration of former slaves in southern states, many of which shared borders with the Midwest.

Turning to the regressions, the core results are presented in three tables, one for each of the three time-varying state institution treatment variables: years with a state library association (Table 3), years with a state library commission (Table 4), and years with some form of library enabling law in effect (Table 5). Each table presents results for various outcome variables and samples. All regressions include county fixed effects and year-by-county pair fixed effects. In an additional table (Table 6) we examine “placebo” regressions using newspapers as the dependent variable.

Table 3 presents the estimates for the library association treatment variable, for two library outcomes: number of public libraries and number of Carnegie libraries. There are three specifications for each outcome variable: the first regression uses the full sample of all border county pairs, assuming modern county definitions—census covariates cannot be used here; the second and third use the sample of counties with consistent modern borders throughout the period 1880-1929, without and with census covariates. Tables 4 and 5 are analogous, for the commission and enabling law treatments.

Examining Tables 3-5, all three state library institution treatment variables have a positive and statistically significant effect in all regressions, with the effect of an additional year of exposure to a library association generally larger than the effect of an additional year with a commission or enabling law. In the association and commission regressions, estimated treatment effects in the



sample restricted to consistent county definitions (columns 2 and 5 in each table) tend to be larger than those for the all-border-county sample (columns 1 and 4). The weaker effects in the all-county sample are perhaps attributable to the fact that the all-county sample includes a substantial number of “frontier” counties that were unlikely to have witnessed much library development during this period regardless of state institutions. Using consistent counties allows us to add time-varying county census covariates as explanatory variables (columns 3 and 6). We include controls for county population, urbanization and city size, proportion nonwhite, and proportion foreign-born. Adding these covariates does not substantively change the estimated treatment effects, suggesting that most of the relevant heterogeneity has been captured in the fixed effects.

We have also conducted other robustness checks for these regressions, including introducing quadratic terms. For the library enabling legislation, we also ran regressions with the index itself as the explanatory variable, along with lagged measures of the index. The implications of these other specifications are consistent with the main findings reported here.

Table 6 provides a placebo analysis in which we use the number of newspapers in the county as the dependent variable, drawing on data from Gentzkow, Shapiro and Sinkinson. Presumably institutions and laws promoting library development should not have had a causal impact on newspaper development, although it seems plausible that newspapers might have been founded in the same kinds of towns that developed libraries. In these regressions, using the full border county sample, the coefficients on the library association and commission variables are not statistically significant, while the coefficient on enabling laws is. Overall we take the evidence from these placebo regressions as favorable to the validity of our identification strategy, although the significant effect of the enabling law treatment on newspapers is of some concern.<sup>24</sup>

How large are these estimated effects? On its face, our estimate of 0.015 additional libraries per county per year of exposure to a state library association appears quite modest. To gauge the magnitude of these effects more systematically, we construct the following kind of counterfactual. Using our estimated association effect of 0.015, we predict the number of additional public libraries for all border counties over the period 1880-1929, given the actual time path of association formation, and compare it with the actual change over the same period. We also predict the number of additional libraries “out of sample,” applying the treatment effect to all state counties, including interior counties.

The results are summarized in Table 7. In the first row, for example, we use the estimated association effect from the all-border sample (0.015) to predict the number of additional libraries in the same sample. For these counties, the number of public libraries increased by 1,176 between 1880 and 1929; the estimated association effect predicts an increase of 467, or 40 percent of the actual change. The table suggests that state-level library promotion efforts could have had a substantial impact on library development. Indeed, using the consistent-county sample to predict library growth for the entire country (fourth row), associations can account for nearly all (94%) public library growth nationally. The predicted impact of library commissions and enabling laws is somewhat smaller, but still quite substantial, accounting for 20-40 percent of library growth over the period.

## **7. Conclusion**

Public libraries were often local initiatives and reflected a variety of local conditions. But the public library movement was enabled and supported by state legislation and organizations. Library boosters hoped these efforts would increase the establishment of libraries and thereby spread their purported salutary influence on education, civic engagement, and morals.

To the extent that state library commissions, associations, and laws were successful in promoting local public library development, we would expect to observe more libraries in states with associations and/or commissions than in those without, and also in states with more developed library enabling laws, *ceteris paribus*. Indeed, previous work by Kevane and Sundstrom, reporting the results of a state-level panel regression of library development on a variety of demographic and other controls, including state fixed effects, found that both library commissions and associations had positive and significant effects on library development. But at the state level, the creation of library commissions, associations, and legislation was undoubtedly endogenous to the interest in and prior level of development of public libraries, and it cannot be claimed that those regression coefficients establish the direction of causality.<sup>25</sup>

In this paper we exploit state-time variation in the enactment and modification of state library legislation and in the founding of state library commissions and associations to assess the impact of these library promotion efforts on the development of local public libraries. Our difference-in-differences identification strategy relies on matching adjacent counties across state boundaries to compare measures of library development between treatment and control counties when one state's institutions changed, a methodology employed in work by on the effects of state-level minimum wage laws. Using county-level census data, we also controlled for local population and measures of urbanization that could be expected to influence library development. The identifying assumption is that in many states, conditioning on observable characteristics, the "library-proneness" of a border county was likely to be much more similar to its contiguous neighbor across the state border than it was to the mean or median county in that state that determined state-level library policy.

Our empirical estimates suggest that state-level initiatives to promote local public libraries had a large positive impact on library development. Indeed, our estimates suggest that from 40 to more than 90 percent of library growth between 1880 and 1929 could be accounted for by the impact of state library associations on local library development. Of course, there were many other forces at work during this period that expanded the number and reach of public libraries across the United States. But we believe we have established convincingly that state-level library boosterism accelerated the pace of local library development during this critical phase of the public library movement.

Local-level public institutions were significantly influenced by the establishment of these state-level institutions and enabling legislation. The finding has implications for interpretations of the history of the United States as a "nation of joiners." While joiners and local associations were a key component in the development of an engaged citizenry that enabled the development of a well-functioning democracy, the role of larger scale associational institutions should not be neglected. They led, and enabled, the joiners. Local civic engagement and associational life was notably influenced by larger scale civic and political action. Without these state-level associations and the institutional change facilitated, local provision of public goods might have been far lower than it was. So while local social capital, local electoral competitiveness, and rules regarding the franchise

were likely of considerable significance, so to were these state-level institutions. It remains to be seen whether the influence of regional institutions on other local public goods can be inferred from quantitative data.<sup>26</sup>

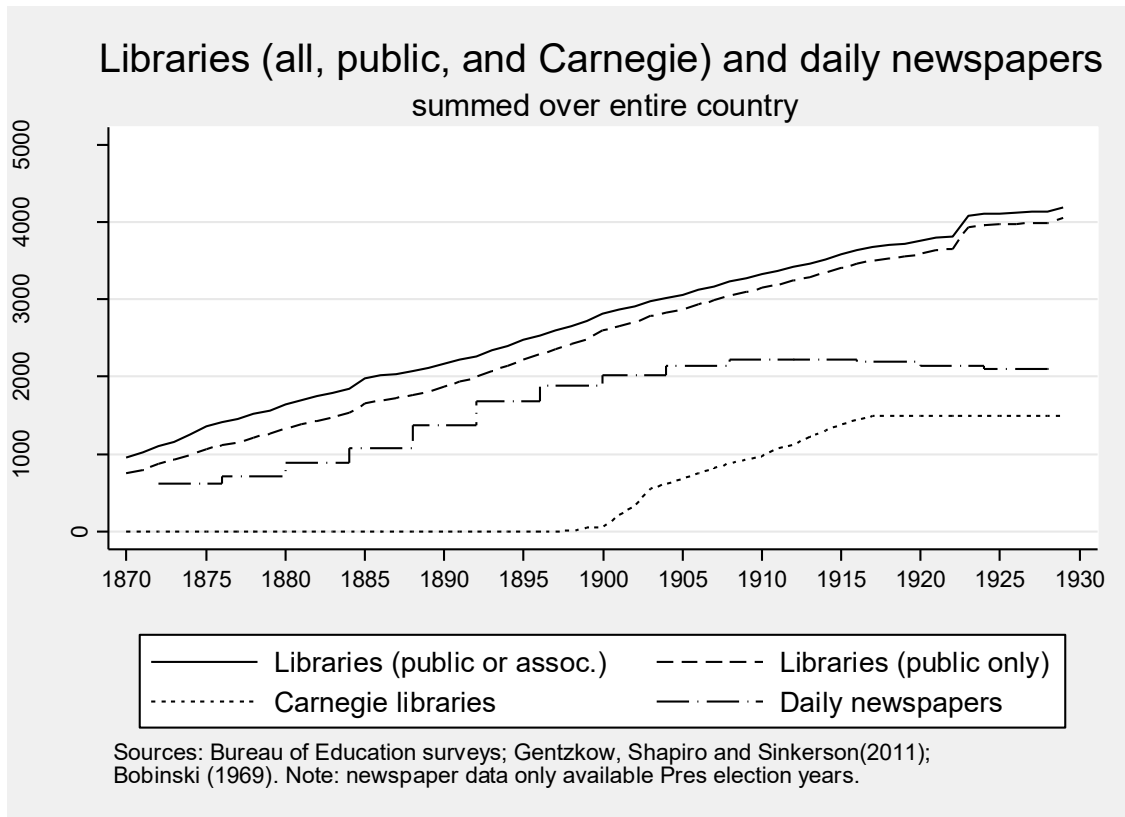


Figure 1: Public libraries, Carnegie libraries, and newspapers in the United States, 1870-1929

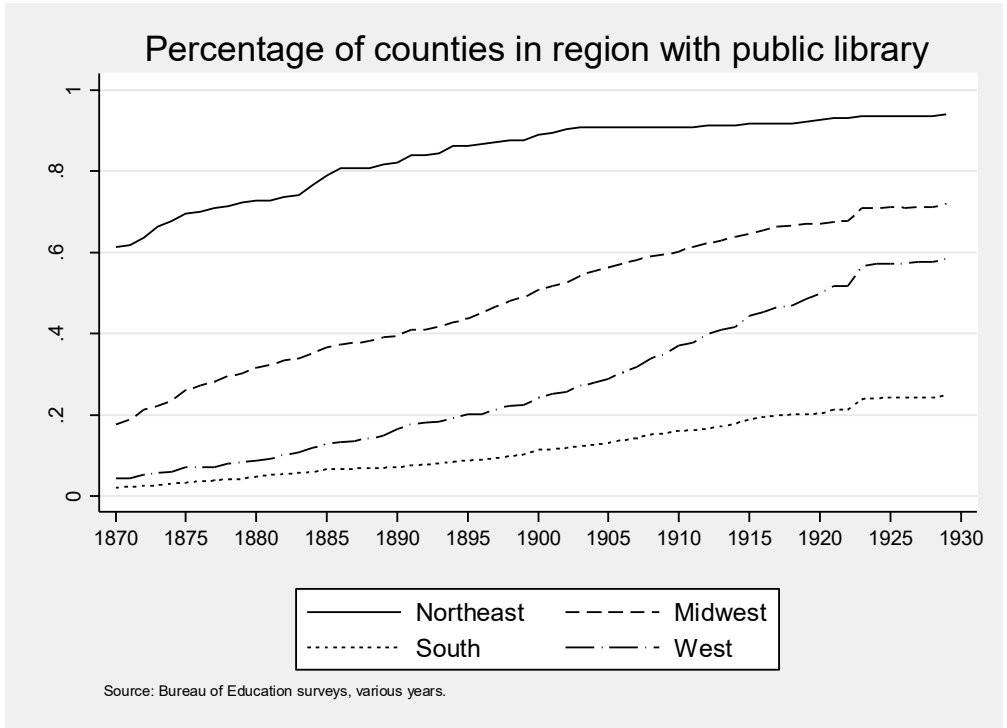


Figure 2: Percentage of counties with public libraries, by region, 1870-1929

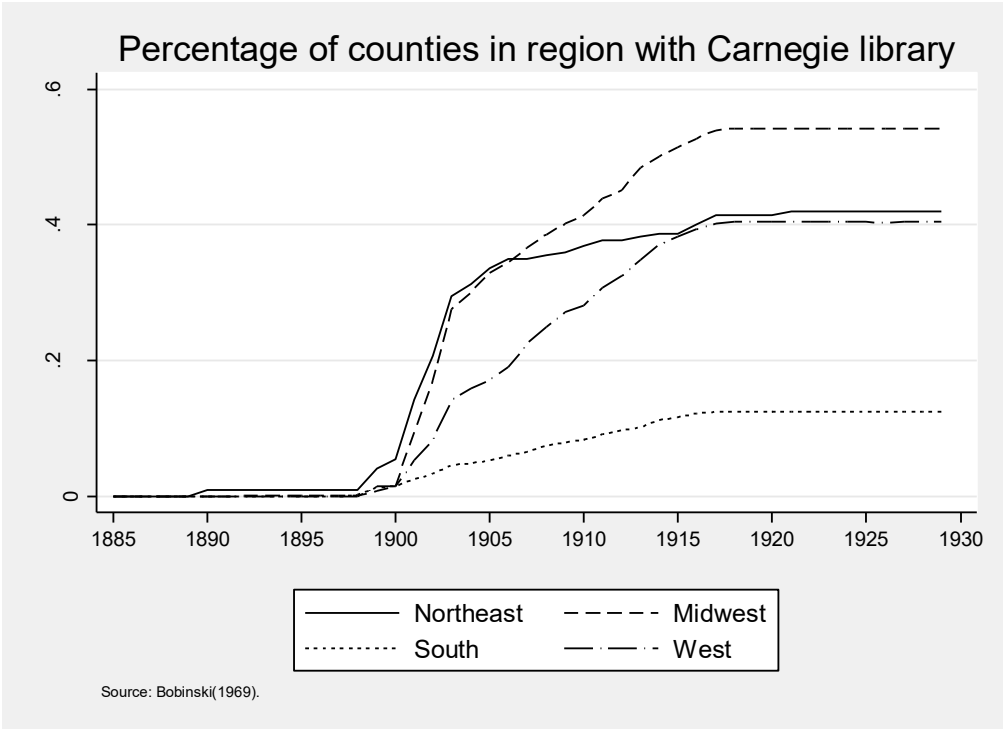


Figure 3: Percentage of counties with Carnegie libraries, by region, 1885-1929

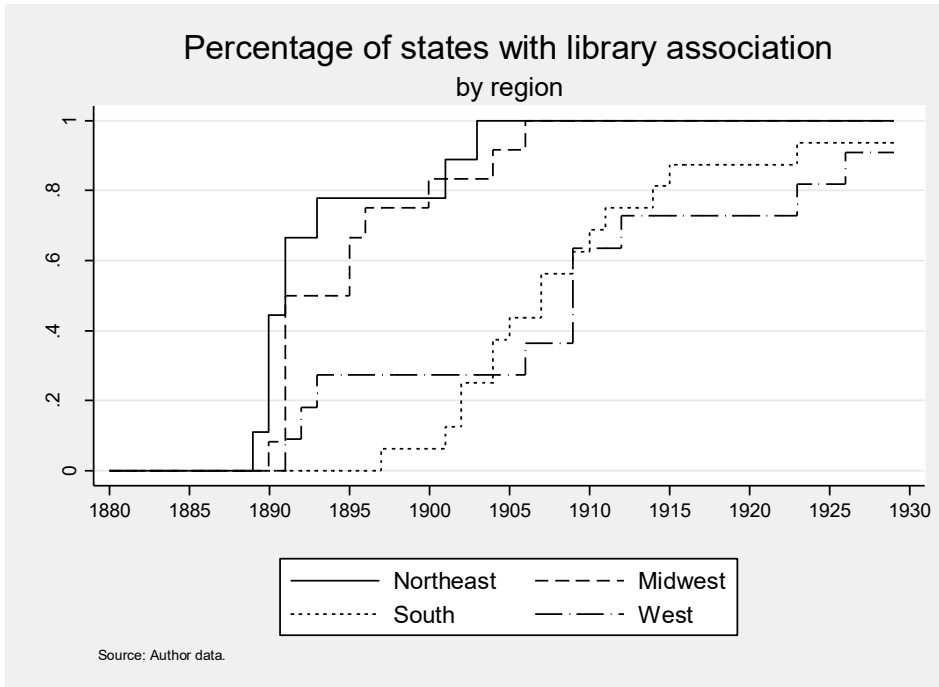


Figure 4: Percentage of states with library associations, by region, 1880-1929

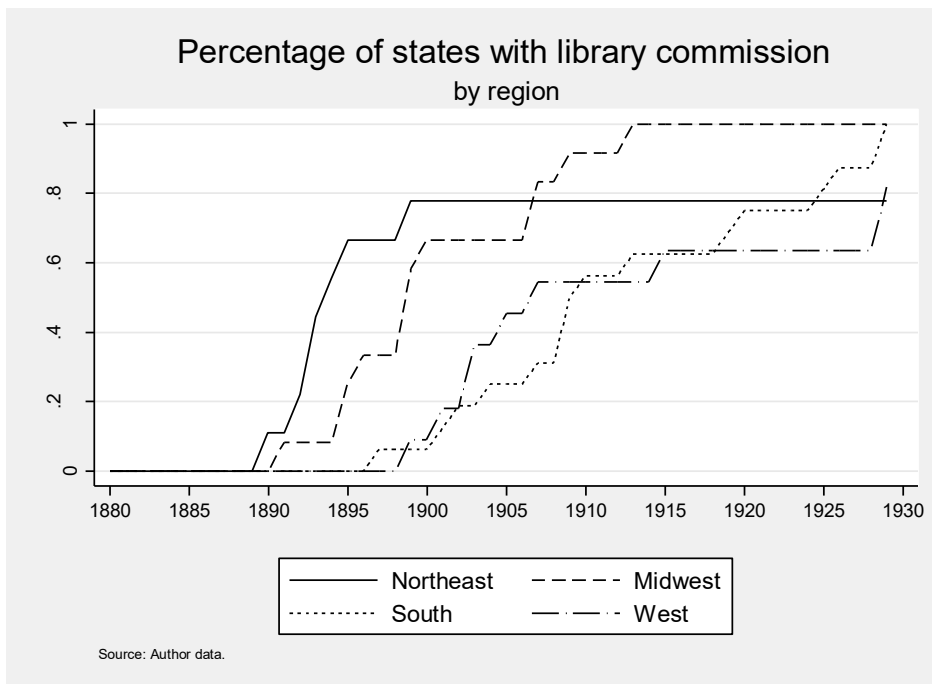


Figure 5: Percentage of states with library commissions, by region, 1880-1929

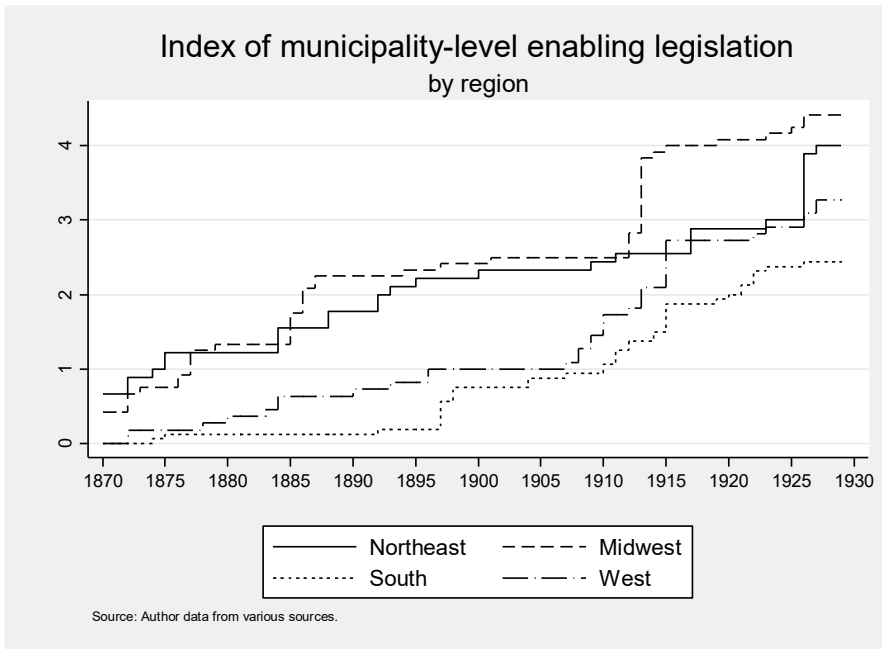


Figure 6: Mean of index of enabling legislation for municipalities, by region, 1880-1929

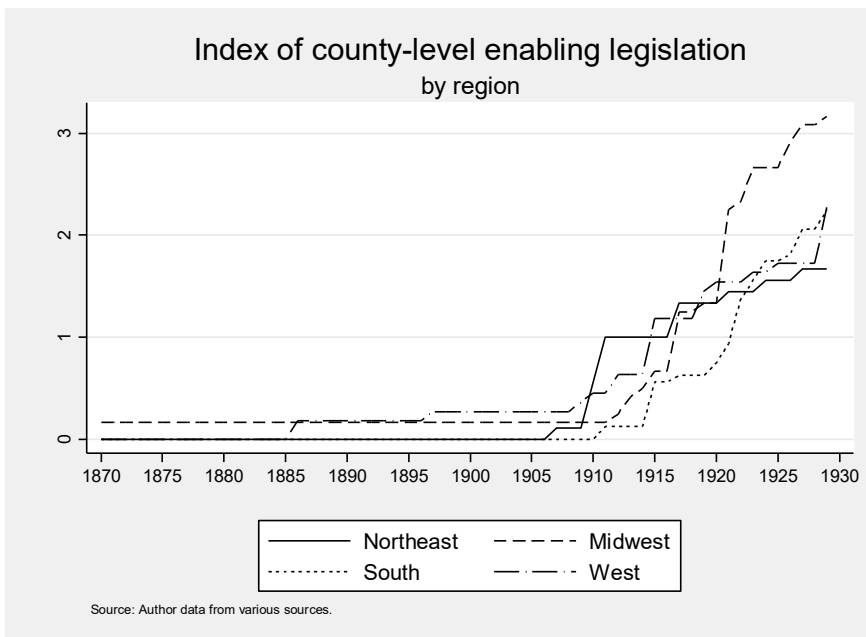


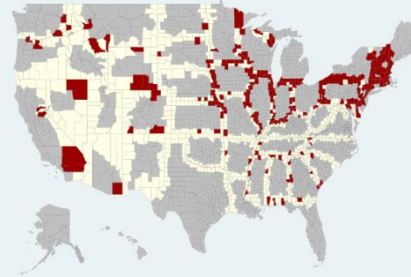
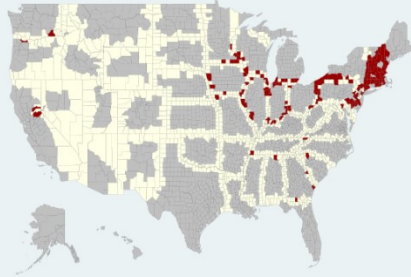
Figure 7: Mean of index of enabling legislation for counties, by region, 1880-1929

### Presence of library in border counties, 1870-1929

Dark indicates presence of public library in county

1870

1890



1910

1929

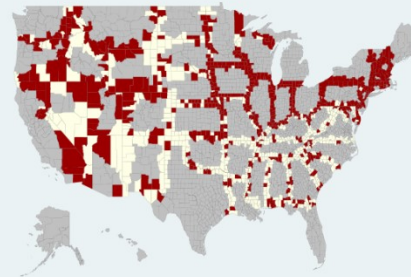
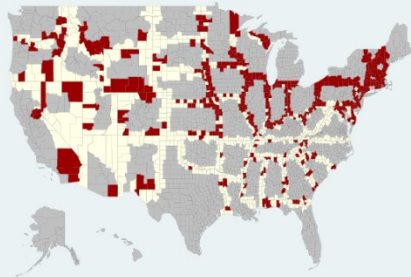


Figure 8. Border counties (modern boundaries) and presence of at least on library by year



Table 1: Descriptive statistics of library measures and demographic variables, for counties on state borders and those not on border, for various years

	Not border county		Yes border county		
	mean	st.dev	mean	st.dev.	
1884 (n= )	1426		824		
Did county have any public library?	0.25	0.44	0.3	0.46	***
Number of public libraries in county	0.45	1.25	0.98	3.8	***
Number of Carnegie libraries	0	0	0	0	
Is there a Carnegie library?	0	0	0	0	
Number of daily newspapers	0.4	1.41	0.5	1.32	*
Is there a daily newspaper?	0.17	0.38	0.2	0.4	*
Total population of county	20205.3	33793.6	25377.5	53247.5	**
Percent of pop. in urban places >2,500	0.093	0.18	0.12	0.21	***
Percent of pop. in urban places >25,000	0.018	0.11	0.033	0.14	***
Percent of pop. female	0.47	0.044	0.48	0.048	***
Percent of pop. non-white	0.15	0.22	0.14	0.21	
Percent of pop. foreign born	0.1	0.12	0.097	0.12	
1900 (n= )	1640		953		
Did county have any public library?	0.35	0.48	0.38	0.49	
Number of public libraries in county	0.76	1.96	1.36	4.5	***
Number of Carnegie libraries	0.024	0.21	0.017	0.13	
Is there a Carnegie library?	0.021	0.14	0.017	0.13	
Number of daily newspapers	0.7	1.68	0.85	1.86	**
Is there a daily newspaper?	0.28	0.45	0.29	0.46	
Total population of county	24580.3	50170.1	30812	84886.1	**
Percent of pop. in urban places >2,500	0.14	0.22	0.15	0.23	
Percent of pop. in urban places >25,000	0.028	0.14	0.043	0.17	**
Percent of pop. female	0.48	0.034	0.48	0.041	
Percent of pop. non-white	0.14	0.21	0.13	0.21	
Percent of pop. foreign born	0.091	0.1	0.089	0.1	
1916 (n= )	1742		1018		
Did county have any public library?	0.46	0.5	0.48	0.5	
Number of public libraries in county	1.01	2.16	1.6	4.61	***
Number of Carnegie libraries	0.52	0.95	0.48	0.91	
Is there a Carnegie library?	0.34	0.48	0.32	0.47	
Number of daily newspapers	0.74	1.72	0.82	1.7	
Is there a daily newspaper?	0.33	0.47	0.32	0.47	
Total population of county	31067.3	76904.5	37535.4	117299.3	
Percent of pop. in urban places >2,500	0.18	0.24	0.19	0.25	
Percent of pop. in urban places >25,000	0.046	0.17	0.055	0.18	
Percent of pop. female	0.48	0.024	0.48	0.027	
Percent of pop. non-white	0.13	0.2	0.12	0.2	
Percent of pop. foreign born	0.076	0.087	0.073	0.086	

Note: Asterisks indicate whether significant statistical difference between counties without libraries and counties with libraries, respectively \* p<0.10 \*\* p<0.05 \*\*\* p<0.01. Means and standard deviations and differences between means are calculated for each variable with data available for that variable; some variables, had missing observations. Maximum number of counties is indicated for each year;

Table 2: Average percent differences over all counties in region, between differences in-state values and differences in cross-border values of various demographic variables

	Northeast	Midwest	South	West
1884				
Total population of county	221.65	238.12	289.57	432.20
Percent of pop. in urban places >2,500	186.21	30.47	-19.63	-51.23
Percent of pop. in urban places >25,000	8.49	-42.39	74.72	0.00
Percent of pop. female	1310.80	181.85	273.48	50.64
Percent of pop. non-white	910.78	1497.98	2899.99	387.25
Percent of pop. foreign born	598.39	377.56	1094.94	166544.06
Percent of pop. Catholic				
1900				
Total population of county	1472.09	739.34	151.52	1700.10
Percent of pop. in urban places >2,500	254.02	9.71	-2.31	-37.72
Percent of pop. in urban places >25,000	-0.21	-21.57	-14.12	0.00
Percent of pop. female	2253.44	1425.42	1497.49	432.55
Percent of pop. non-white	230.98	1544.04	1905.94	1539.14
Percent of pop. foreign born	263.69	423.20	1099.08	807.12
Percent of pop. Catholic	127.54	752.24	1310.43	234.26
1916				
Total population of county	631.02	459.40	145.31	706.24
Percent of pop. in urban places >2,500	278.92	28.74	22.11	-25.87
Percent of pop. in urban places >25,000	39.72	-23.06	66.58	-50.00
Percent of pop. female	97.39	418.87	195.29	1604.97
Percent of pop. non-white	1293.02	150279.08	4319.40	562.88
Percent of pop. foreign born	1890.16	1149.12	1706.21	531.60
Percent of pop. Catholic	139.80	1835.86	1214.81	2782.08

Note: For each county and year, two differences (absolute value) are calculated. First, the difference between the county value and the mean of all other counties in the state, excluding the county. Second, the difference (absolute value) between the county and the adjacent county across the state border. Then the percent difference between the in-state difference and the cross-border difference is calculated. Then these differences are averaged for all border counties in the region, for each of the three years.

Table 3: Effects of state library association

Dependent variable: years with state library association

	Number of public libraries			Number of Carnegie libraries		
	(1)	(2)	(3)	(4)	(5)	(6)
Years since founding of library association	0.0150*** (0.00320)	0.0292*** (0.00583)	0.0319*** (0.00575)	0.0108*** (0.00223)	0.0157*** (0.00323)	0.0188*** (0.00321)
County population in millions			2.800** (1.368)			3.646*** (0.927)
Prop population living in cities 2500+			2.572*** (0.356)			1.119*** (0.238)
Prop population living in cities of 25000+			-0.828*** (0.309)			0.219 (0.209)
Prop population nonwhite			-0.134 (0.341)			0.631** (0.311)
Prop population foreign-born			1.478 (1.021)			-0.287 (0.709)
Constant	0.288*** (0.0274)	1.042*** (0.0502)	1.725*** (0.161)	-0.0728*** (0.0191)	0.0522* (0.0281)	-0.373*** (0.127)
Observations	173460	75200	75190	173460	75200	75190
R-squared	0.928	0.959	0.961	0.403	0.493	0.543
Sample	All borders	Consistent	Consistent	All borders	Consistent	Consistent

Notes: \* 0.10 \*\* 0.05 \*\*\* 0.01. Stata xtreg estimation used. All regressions include county and pair-year fixed effects.

Table 4: Effects of state library commission

Dependent variable: years with state library commission

	Number of public libraries			Number of Carnegie libraries		
	(1)	(2)	(3)	(4)	(5)	(6)
Years since founding of library commission	0.00980*** (0.00217)	0.0144*** (0.00335)	0.0167*** (0.00332)	0.00635*** (0.00185)	0.0118*** (0.00290)	0.0129*** (0.00294)
County population in millions			2.208 (1.871)			4.083*** (1.308)
Prop population living in cities 2500+			2.092*** (0.285)			1.095*** (0.228)
Prop population living in cities of 25000+			-0.352 (0.233)			0.382* (0.210)
Prop population nonwhite			0.486 (0.308)			0.751*** (0.276)
Prop population foreign-born			2.070** (0.977)			-0.0702 (0.717)
Constant	0.404*** (0.0185)	0.788*** (0.0230)	0.354** (0.148)	-0.0202 (0.0157)	0.0316 (0.0198)	-0.344*** (0.126)
Observations	167280	74750	74740	167280	74750	74740
R-squared	0.936	0.962	0.964	0.396	0.491	0.545
Sample	All borders	Consistent	Consistent	All borders	Consistent	Consistent

Notes: \* 0.10 \*\* 0.05 \*\*\* 0.01. Stata xtreg estimation used. All regressions include county and pair-year fixed effects.

Table 5: Effects of state library enabling laws

Dependent variable: years with any library enabling law

	Number of public libraries			Number of Carnegie libraries		
	(1)	(2)	(3)	(4)	(5)	(6)
Years since first enabling law of any kind	0.00867*** (0.00165)	0.00715*** (0.00218)	0.00782*** (0.00233)	0.00714*** (0.00145)	0.00617*** (0.00182)	0.00604*** (0.00185)
County population in millions			2.636* (1.386)			3.525*** (0.925)
Prop population living in cities 2500+			2.330*** (0.331)			1.008*** (0.224)
Prop population living in cities of 25000+			-0.822*** (0.299)			0.173 (0.204)
Prop population nonwhite			0.347 (0.305)			0.731*** (0.273)
Prop population foreign-born			1.467 (0.974)			-0.234 (0.683)
Constant	0.392*** (0.00973)	1.684*** (0.0604)	-0.0436 (0.208)	-0.0410*** (0.00855)	0.577*** (0.0504)	-0.477*** (0.141)
Observations	164460	77850	77780	164460	77850	77780
R-squared	0.928	0.958	0.960	0.403	0.488	0.533
Sample	All borders	Consistent	Consistent	All borders	Consistent	Consistent

Notes: \* 0.10 \*\* 0.05 \*\*\* 0.01. Stata xtreg estimation used. All regressions include county and pair-year fixed effects.

Table 6: Effects of state library institutions on newspapers, all-county border sample

	Dependent variable: number of newspapers		
Years since founding of library association	0.00528 (0.00326)		
Years since founding of library commission		-0.000271 (0.00192)	
Years since first enabling law of any kind			0.00748*** (0.00229)
Constant	1.064*** (0.0313)	0.231*** (0.0172)	0.910*** (0.0641)
Observations	40500	39375	41115
R-squared	0.801	0.787	0.799

Notes: \* 0.10 \*\* 0.05 \*\*\* 0.01. Stata xtreg estimation used. All regressions include county and pair-year fixed effects.

Table 7: Actual growth in public libraries compared with simulated effect of library institutions

Library institution	Estimating sample	Simulation sample	Coefficient	Actual number of libraries		Actual change	Predicted change	Predicted/actual
				1880	1929			
Association	All borders	All borders	0.0150	729	1905	1176	467	0.40
	Consistent	Consistent	0.0292	710	1700	990	615	0.62
	All borders	All counties	0.0150	1340	4058	2718	1312	0.48
	Consistent	All counties	0.0292	1340	4058	2718	2554	0.94
Commission	All borders	All borders	0.0098	729	1905	1176	238	0.20
	Consistent	Consistent	0.0144	710	1700	990	242	0.24
	All borders	All counties	0.0098	1340	4058	2718	673	0.25
	Consistent	All counties	0.0144	1340	4058	2718	989	0.36
Enabling	All borders	All borders	0.0087	729	1905	1176	367	0.31
	Consistent	Consistent	0.0071	710	1700	990	204	0.21
	All borders	All counties	0.0071	1340	4058	2718	1020	0.38
	Consistent	All counties	0.0087	1340	4058	2718	841	0.31

Note: Simulations predict change in libraries for each county using estimated institution coefficient and actual time path of institutions. Consistent sample refers to balanced panel of counties with modern boundaries throughout 1880-1929.

## Footnotes

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