

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

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ABSTRACT

The late nineteenth and early twentieth centuries witnessed a rapid increase in the number of local public and quasi-public (social) libraries across many parts of the United States. Public libraries were often local initiatives and reflected a variety of local conditions. But the public library movement was also promulgated by state legislation and organizations. In this paper we focus on the impact of state library associations and commissions, which acted as full-time advocates and guides for the creation of new libraries in municipalities and counties in their states. Established by legislation, library commissions were state entities charged with helping localities establish libraries. Associations were voluntary organizations with a similar mission, having as members the librarians of existing public 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 and associations on library development in matched pairs of counties that straddle state borders. Our results suggest that state library associations and commissions had a statistically and economically significant effect on public library development, measured as the number of communities with a public library.

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1. Introduction

The late nineteenth and early twentieth centuries witnessed a rapid increase in the number of libraries in towns and cities across the United States. Civic leaders and philanthropists devoted time and funds to establishing and supporting libraries. These leaders were part of a social movement, articulated most clearly in the goals and accomplishments of women's clubs and the federations of women's clubs that periodically brought them together at the state and national level. 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.

As the number of libraries expanded, the institutions that established and operated them changed. 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.

The spread of public libraries was uneven, however, because there were numerous constituencies opposed to libraries. Not all agreed that libraries were good civic investments. Most communities in the South, for example, did not establish public libraries until the 1930s. Many communities rejected offers to establish libraries. Opposition to Carnegie grants for libraries, for instance, was fierce in some towns, where the money 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. Moreover, public libraries, once established, were not always successful: McMullen (2000) suggests that of 1,559 libraries created during the 1840s and 1850s in Michigan and Indiana after passage of state laws mandating so-called township libraries, only 81 survived by 1876. The establishment of libraries thus depended on competing assessments and changing capabilities that varied with local, state and national social and economic environments, institutions, and preferences.

This paper contributes to the historiography of the expansion of libraries by assessing the role of organized state-level efforts to promote public libraries. Librarians at existing libraries formed state library associations, whose primary goal in the early years was to promote the establishment of more public libraries in the state by lobbying government, supporting applications for Carnegie libraries, and complementing the work of state library commissions. Likewise, many state governments established library commissions with the express mission of aiding local communities in establishing and operating libraries effectively. These associations and commissions were formed in the years after 1889-90, when a number of states (including Iowa, Mass., Ohio, New York, and New Jersey) established library associations. The American Library Association, established in 1876, had urged librarians to form state associations.

States also facilitated local library development through so-called library enabling legislation that permitted local governments to establish and fund public libraries. Such laws were sometimes written by and generally supported by state library association leaders and members. Initially, this legislation amounted to brief declarations that municipalities and other local government entities were authorized to tax for and manage public libraries. After the Illinois enabling legislation of 1872 (a response to the commitment to rebuild the Chicago Public Library after the fire of 1871), however, legislation became much more detailed. Typical enabling legislation specified a maximum mill rate or poll tax for different municipal entities, a process for residents to petition for and vote on a library tax, and a process for establishing a quasi-independent library board to administer the library.

The effect of state institutions and laws to promote libraries is not self-evident. There appear to have been some states where associations and commissions had little impact on the trajectory of public library establishment. Moreover, given that the trend towards public libraries was already well-established, it is not at all clear that the commissions, associations, and laws had a significant causal impact. These efforts may have merely reflected and "crowned" an existing trajectory.

The impact of these state institutions is of interest in understanding generally the effectiveness of civic and governmental coordinating institutions, a policy issue that remains relevant in developed as well as developing countries. In poor countries, rising incomes and the success of the Millennium Development goal of prioritizing universal primary schooling have increased interest in promoting public libraries. Philanthropists and communities have taken the initiative to establish libraries. An important civic and public policy issue is the likely cost-effectiveness of national or regional promotional efforts. Should resources be directed to national and regional institutions? The history of the public library movement in the United States may shed light on this question.

In addition, we are ultimately interested in analyzing the impact of local libraries on a variety of outcomes, including voting behavior, human capital accumulation, and economic growth. A crucial first step toward identifying those impacts is establishing a clear understanding of the determinants of library development and, if possible, finding instruments or natural experiments that could help establish causality.

In this paper we focus on assessing the causal impact of state library associations and commissions on local library development. We have also coded library enabling laws and intend to examine their impact in future work. Our core data source is 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 suggest that both library associations and commissions had a sizable and statistically significant positive impact on some measures of local public library development, but the results are somewhat sensitive to the measure used..

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 a brief overview of the role of state library associations and commissions in promoting local public libraries. Section 4 explains our methodology, and section 5 describes the data set we use. Section 6 provides the preliminary regression results, and the final section concludes.

2. Spread of public libraries in the United States

The expansion of public libraries in the United States during the 1870-1920 period remains a subject of considerable interest for historians of literacy, reading, education and economic growth (McMullen 2000). The expansion of libraries happened after the spread of primary schools, which had achieved near universal primary enrolment by 1870, and somewhat in advance of the high school movement, which grew most rapidly after 1910 (Goldin 1998). Figures 1 and 2 plot public libraries and volumes held in public libraries on a per capita basis for the period 1875-1929, along with secondary school enrolment rates for comparison. The underlying data are derived from Bureau of Education library survey reports (discussed below), for different thresholds of library size.¹ Because the minimum volume threshold for inclusion in the published reports (and therefore in our data) increased over time, earlier reports captured many small libraries that would be missed in later years; this is evident in Figure 1. But in terms of the number of library books available to library users per capita, the changes in thresholds are of little consequence, as can be seen in Figure 2. Figure 3 plots volumes per capita by region (using a 5000 volume threshold for consistency, and capping larger libraries at 50,000 volumes). As in the case of primary and secondary education, the Northeast led the way early on, but by the late 1920s the West had assumed the lead with the highest per capita penetration of library services. In the South, public libraries continued to be all but nonexistent before 1930, and even after that the region's library development lagged far behind the rest of the country.

There has been little quantitative research on the underlying factors explaining the spread of libraries over time and across regions. Elsewhere, we survey the literature in the field of library history that discusses the factors explaining the expansion of public libraries (Kevane and Sundstrom 2012). The survey suggests there are three categories of factors: (1) institutional precedents for public libraries and innovations that enabled the establishment of public libraries; (2) supply-side factors; and (3) demand-side factors. We briefly review each in turn, and refer the interested reader to the fuller discussion in the paper.

Institutionally, the library movement was closely linked to the growth of women's organizations and their social libraries. The last quarter of the nineteenth century witnessed a

¹ The survey years included here are 1875, 1885, 1891, 1896, 1900, 1903, 1908, 1913, 1923, and 1929. Data on public libraries with at least 300 volumes were published for the 1875 and 1885 surveys; for libraries with at least 1000 volumes 1891-1903; libraries with at least 3000 volumes were unavailable for 1908 and 1913, so the plots interpolate a straight line between 1903 and 1923 for those series.

proliferation of women's literary and cultural clubs in American cities and towns (Blair 1980). The clubwomen's ideology of "Domestic Feminism" emphasized the role of women in education and cultural uplift, and libraries became a key component of their civic reform efforts (McCauley 1982; Mussman 1982). Many of these women's clubs established social libraries. Other fraternal organizations and civic-minded individuals and groups established social libraries, basically relatively non-exclusive clubs whose members agreed to share the costs and benefits of supporting a library open to club members and often to the public. The more social libraries in existence in a county, especially those established by women's clubs, the more likely public libraries would be established. Often a public library was established precisely to take over management of an existing social library. State-level enabling legislation was critical in this regard. Townships and counties needed legal authority to tax and manage public libraries. Enabling legislation that authorized localities to use tax funds to support public libraries evolved from the precedent of local funding of public schools. Legislation after 1870 was expansive in giving municipalities authority to establish tax-supported public libraries. In some states, residents had to vote on measures to authorize taxation for libraries, while in other states town councils could enact the necessary authorization on their own.

On the supply side, it is clear that major philanthropists such as Carnegie hastened the rapid spread of public libraries. Carnegie grants were made to almost 1700 communities. Across the country many other major benefactors either funded libraries during their lifetime or left bequests for public libraries. To our knowledge, no one has compiled a set of comprehensive numbers to estimate the sum of this more scattered private philanthropy, but casual observation of the histories of hundreds of local libraries suggests it was substantial (see Green (1972), a contemporary account reminiscing on the author's involvement with many of the philanthropic and volunteer efforts of the period). Local governments were obviously the other principal source of funding for public libraries, and the fiscal capacity of local government seems to have grown substantially during this period. Wallis (2000) refers to the period 1842-1933 as "the era of property finance and local government." Increased property taxation was politically feasible to the extent that it funded benefits that increased local property values, such as schools, public utilities, local infrastructure, and perhaps library services. Although libraries probably remained a small and fairly stable fraction of local budgets, the general expansion of local governments over this period shifted the budget constraint for all forms of local spending (Joeckel 1935).

On the demand side, rising levels of literacy and educational attainment themselves must have increased general demand for library services. The historical record is very clear, however, that practically all public libraries of the period were started by "library entrepreneurs" seeking to promote the public good. Leaders of the library movement had a variety of motivations for their efforts to establish libraries. Most shared Carnegie's sentiment, based on his own experience, that free libraries were effective mechanisms for aiding the poor. They provided opportunity for self-advancement by enabling people to acquire knowledge through reading. Martin (1998) suggests that the ideology of the public library movement was an amalgam of four conceptions of the role of libraries: as democratic institutions promoting good citizenship (Ditzion 1947); as educational institutions complementing public schools--early on intended for continuing adult education and self-education, but by the 1920s increasingly serving children as their main educational function;

(3) as a source of recreational reading material; and (4) as serving a humanitarian mission, offering an alternative to the saloon, elevating youth, and controlling the masses.

Other rationales for libraries ranged from instrumental (libraries were signals of town economic growth and so would attract and retain investors) to cultural (libraries would acculturate immigrants into the English language and Anglo-Protestant values) to self-serving expressions of elite social status (many early libraries featured elegant wood-paneled rooms where the "library board" would meet for deliberations). Swetman (1991) carefully reviews public discourse surrounding drives to establish public libraries in twenty communities of Utah and Washington at the turn of the century. In the booming Inland Empire communities of Washington, libraries were seen as markers of economic progress and enticements to settlers to take up residence in progressive "can-do" kinds of towns. In Utah, by contrast, public discourse treated libraries as places where the morals of wayward youth might be improved. Swetman draws attention in particular to libraries as an amenity and signal of prosperity used in the competition between towns to attract new residents, even in cases where current residents did not place much value on library services.

Some authors have suggested that libraries were demanded by established citizens as a way to assimilate or control immigrant groups (Harris 1974). But the presence of large numbers of immigrants may also have worked against the demand for public libraries to the extent that ethnic heterogeneity was associated with greater heterogeneity in preferences for public goods or lower levels of civic engagement.

There is little quantitative work to assess the importance of these various factors (an early effort was Williams (1986)). In our earlier paper (Kevane and Sundstrom 2012), we estimate panel regressions using state-year data and find 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 and with the presence of state library commissions and associations. The only demographic control that was consistently statistically significant was the proportion of the population foreign-born. A one-standard deviation increase in proportion foreign-born was associated with an increase in volumes per capita of about 0.14, which was nearly half the full-sample standard deviation. The sizable positive impact of proportion foreign-born is the reverse of the effect of ethnic heterogeneity that Goldin and Katz (1999) find for secondary schooling, suggesting that the ideology of Americanization may have played a relatively more important role in the demand for public libraries than did social homogeneity or solidarity. Other remaining demographic controls—proportion female, proportion black, and age composition variables—did not generally have significant effects. These variables do not change much from decade to decade within states, making it difficult to statistically identify their impact on library development. 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.

3. Library associations and commissions

The timing of the great expansion of public libraries coincides closely with the formation of state library associations and commissions. Figure 4 graphs the diffusion of commissions and associations across states after 1890.² 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 (2005, 39-40) 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.

Organizers might visit hundreds of communities in a single year, holding town meetings and working with town leaders to organize libraries.

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 (Goldstein 2003). Writing about Alabama, White (1997) 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."

Not all associations and commissions were successful in fulfilling their fundamental mission of expanding library services. Sometimes there were disagreements about whether establishing public libraries was the right course of action: many early reading advocates were great believers in traveling libraries. Sometimes the legislature would humor the civic activists who lobbied for a state commission, and pass a law establishing a commission, but then not appropriate any funding for the commission. Such was the case in West Virginia (Julian 2000). At the turn of the century, in 1900, the state only had one public library in Wheeling. Over the next decade Carnegie approved

² Data on commission and association founding dates were derived from a variety of sources, including Bureau of Education reports, association and commission websites and correspondence (see data appendix).

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.

The case of Louisiana appears to have been typical of experience in the South. As Jumonville (2010) recounts, the state library association was founded in December 1909. A number of librarians had put out a call to all the libraries, public, academic and specialized, in the state. Once formed, the association immediately created a legislative committee that drafted a proposal for library enabling legislation that regularized the process for local establishment and oversight of libraries. A large conference followed in April 1910, and by July the state legislature had passed the legislation that "provided that as few as twenty-five citizens of any political subdivision in the state might petition its governing body to establish a public library." But by 1914 the Louisiana State Library Association was apparently defunct, and the Louisiana Federation of Women's Clubs appeared to have taken over responsibility for the few library initiatives undertaken by the association. The LFWC lobbied hard for a state commission, and was rewarded in 1920 with a state act providing for such. The new commission, and prior library enabling legislation, facilitated a \$50,000 Carnegie grant in 1925 to establish rural parish libraries. A new association was also established in 1925.

Texas has a similar, though earlier, history, according to Cummings (2009: 304):

The establishment of a state library commission in Texas was the primary goal of Mary Terrell's administration of the TFWC [Texas Federation of Women's Clubs]; she published and circulated pamphlets espousing the virtues of such a government agency. After the Texas Library Association (TLA) was organized in 1902, the TFWC focused on other worthy causes, but its leaders, most notably Mary Terrell and Anna Pennybacker, did not relent in the campaign for a state library commission. Together with the TLA, the TFWC supported a bill establishing the Texas Library and Historical Commission, an organization, they believed, whose primary purpose would be extension work, including the administration of a traveling library system. ... Unfortunately, Texas legislators and bureaucrats proved disconnected from the needs and reality of Texas libraries. A first attempt to pass legislation to establish a library commission prior to the formation of the TLA had failed in 1899, and the next three attempts to pass a commission bill, from 1903 to 1907, met defeat as well. In 1909 a bill was introduced that at last succeeded in creating the Texas Library and Historical Commission.

The Commission's budget, however, was tilted heavily towards the "historical preservation" side, and for a couple decades the commission apparently provided very little support to rural readers. The situation in Texas changed when county libraries began to be established in the 1930s, especially as a result of Works Progress Administration funding.

4. Using adjacent counties across state borders to estimate causal effects

To the extent that state library commissions and associations were successful in promoting local public library development, we would expect to observe more libraries in states with commissions and/or associations than in those without, *ceteris paribus*. Indeed, in our previous work (Kevane and Sundstrom 2012), we report the results of a state-level panel regression of library development on a variety of demographic and other controls, including state fixed effects, in which both library commissions and associations have positive and significant coefficients. But at the state level, the creation of library commissions and associations was undoubtedly endogenous to the interest in and prior level of development of public libraries, and it cannot be claimed that the regression coefficients establish the direction of causality.

To provide a more convincing test of the causal impact of commissions and associations on library development in this paper, we use a difference-in-differences framework that exploits time-varying differences in these institutions between states for pairs of contiguous counties straddling state borders. For our outcome variables we use data on library development derived from a series of library surveys conducted by the U.S. Department of Education over the period 1875-1929. Identification of the association and commission effects is based on variation over time within the county pair, controlling for the common time path of library development for the pair. The approach is similar in spirit to the well-known work on minimum wage effects by Card and Krueger (1997), and in fact we implement a particular version of the county-pair strategy used by Dube, Lester, and Reich (2010) in a more recent study of minimum wage effects. Similarly, Naidu (2012) uses 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.

The key identifying assumption is that within the contiguous county pairs, 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 there were evidence that contiguous counties across borders had different civic processes regarding library political economy, *and* that those processes were also significant determinants of state-level processes resulting in the formation of library associations and commissions. While it is undoubtedly true that the formation of state associations and commissions 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, 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 counties that likely influenced state-level initiatives.

To implement the county-pair strategy, we use the panel regression approach employed by Dube, Lester and Reich (2010). The library surveys we use 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. Specifically, we regress the library dependent variable y_{ipt} against the time-varying state library

variables (years of exposure to a library association or commission), county fixed effects, and a fully saturated set of fixed effects for cross-border county pairs by year:

$$y_{ipt} = \alpha + \beta_A A_{it} + X_{it}' \gamma + \varphi_i + \tau_{pt} + \varepsilon_{ipt} \quad (1)$$

where A_{it} is the years of exposure to the state institution or law in county i and year t ; X_{it} is a vector of county time-varying controls; φ_i is a county fixed effect; τ_{pt} is a pair-specific time effect; and ε_{ipt} is the error term. In our 1880-1929 estimating sample of 59,200 observations, τ_{pt} accounts for 29,600 fixed effects in the estimation. Note that it is possible to identify both the county and pair-specific fixed effects for many counties, because many counties pair with more than one other county and enter the sample more than once. We cluster standard errors at the county level to account for the correlation between observations that arises mechanically from any given county appearing more than once in the data.

The coefficient β_A 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 the state institution being present in the state. A simple counterfactual allows us to judge the quantitative as well as statistical significance of this effect.

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 associations and commissions 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.

5. Data

We constructed a border county pair panel for the period 1880-1929. Our key outcome variables are measures of the extent and intensity of local public library services, and our principal “treatment” variables are measures of exposure to state-level institutions or laws intended to boost library development. We also include a few time-varying demographic and other controls.

Public library data

Our data on public libraries come from special reports on libraries issued by the U.S. Bureau of Education, based on library surveys it conducted for the years 1875, 1885, 1891, 1896, 1900, 1903, 1908, 1913, 1923, and 1929. These reports tabulated the returns of all responding libraries above a certain threshold size (in volumes). The statistics reported in the published tables always included the name and location (state and town or city) of the library, some classification as to type of library, number of volumes in the collection, and in all but one year (1923) the year of founding. A variety of additional information was often collected, although questions and response rates varied by survey. The Bureau worked from an extensive list of libraries, procured from local postmasters, directories, and other sources. It sent letters of inquiry to the libraries identified, with one or more follow-ups to non-responding libraries.

Reports for different years used different minimum size thresholds for publishing individual library data, creating some challenges for comparability across survey years. 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; 1908 and 1913 a threshold of 5,000 volumes; and 1923 and 1929 a threshold of 3,000 volumes.³

To create the county-year panel of library services used here, we construct measures of public library services for each place (town or city) at each survey date, interpolate these measures if necessary between survey dates, match places to counties, and aggregate to the county level. We then divide these measures by total population to create measures of library services per capita (we also examine libraries per square mile in some specifications). Finally, we create pairs of counties that straddle state borders.

The first step in creating the library data set is to restrict the sample in each survey to libraries that meet a reasonably consistent definition of “public library.” The kinds of libraries surveyed, as well as the classification schemes adopted in the survey reports, evolved over time, as the institutional structure of the public library system itself evolved. We base our classification scheme on the classifications provided by the library survey reports themselves and an analysis of library names. For the earlier reports (1875-1908), we classify a library as public if it was classified as a public or general library in the report, or the library name indicated that it was a public-type library, such as “Springfield public library,” “Springfield town library,” “Carnegie library,” or the like. The reports (1913-1929) based their classification on the source of control, and we define public libraries as those controlled by a local government or, again, those with a name indicating a local public-type library. We exclude libraries that evidently were associated with an organization such as a school, bar association, hospital, church, museum, or the like.

Although ideally we would like to link individual libraries across survey dates to track their development, this turns out to be challenging in practice. Libraries frequently changed names from

³ Details about the individual library surveys and the survey procedures are contained in a data appendix available from the authors.

one survey to the next, and mergers occurred, sometimes resulting in a decrease in the number of libraries even as the total volume holdings continued to grow. Consequently, we use two measures of library services that do not depend on matching individual institutions across surveys. The first is simply a dummy variable equal to 1 if a public library is or ever has been present in the town; the second is the total number of volumes in all public libraries in the town at each date. Each measure has advantages and disadvantages. Volume counts are less sensitive to the exclusion of smaller libraries due to the volumes reporting threshold, and they account for the fact that, *ceteris paribus*, a larger town could provide library services similar to a smaller town simply by having a larger library. On the other hand, the mere presence of a library may have had a discrete local impact, which we try to take account of in our analysis using the dummy variable for any library.

We make use of the reported founding dates of libraries to extrapolate library existence and volumes back in time. Our procedure is to identify the earliest founding date (year) of any public library in a town in any survey. We then use the volume count from the earliest survey year for that town and extrapolate volumes back in time to the founding date assuming a 5 percent annual growth rate in volumes.⁴ 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.⁵ The completeness of this variable varies across survey years, but overall we can assign founding dates for a large majority of our libraries (nearly 97% of the full sample).⁶ We acknowledge, however, that reported founding dates are subject to various sources of measurement error.⁷ We also extrapolate volumes forward in time by assuming that a place's library or libraries continued to exist beyond the last survey that records them. If the last survey for a town is before 1929, we extrapolate forward in time to 1929 again by assuming 5 percent annual growth rate.

Our dummy variable indicator is equal to one if a public library has ever been present in a town, based on the earliest reported founding date or earliest survey year in which any public library existed in the town. When this variable is aggregated (summed) to the county level, it can be interpreted as the number of distinct places (towns or cities) that had a library by the relevant year. To scale the volumes count, we measure it on a per capita basis. For the count of places with

⁴ Regression analysis of volume growth in libraries between known survey years suggests that 5 percent growth is a reasonable assumption.

⁵ We continue to research the history of libraries with missing founding dates, and future revisions of the paper will use these additional founding dates in the analysis.

⁶ The relatively small number of remaining missing founding dates are imputed by assigning a weight of zero starting 25 years prior to the first survey year in which a library appears in a town, and increasing the weight linearly up to one at the first survey year. In effect, this assigns a stochastic founding date with uniform probability on all years up to 25 years prior to the first survey.

⁷ Most importantly, perhaps, because many local public libraries evolved from one or more antecedent local institutions, the founding date is intrinsically ambiguous: should it be the year the voluntary association library was formed, or the year the town government took over the association's collection and began supporting the library with public funding? We presume different respondents may have answered this question differently.

libraries, we try two different ways of scaling it: one on a per capita basis, and the other on a per square mile basis, using county land areas.

State library associations, commissions, and other variables

Using a number of primary and secondary sources, including compendia of library laws and legislation, we compiled data for each state on the founding years of state library associations and commissions.⁸ To each county-year observation in our library panel we link variables measuring a county's years of exposure to the state library commission (association). These two variables take the value 0 up to the year the commission (association) was formed, and increase by 1 each year thereafter. These are our time-varying "treatment" variables. This formulation of the treatment assumes that the impact of a commission or an association is to change the rate of library development in the state, *ceteris paribus*. Table 1 shows the commission and association founding dates by state.

We generate time-varying demographic and economic variables using county-level data from ICPSR 2896, compiled and edited by Michael Haines (Haines/ICPSR 2010). These include total population and its composition by gender and nativity, indicators of urbanization, and county land area. 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.

Border county pairs

To create a sample of adjacent county pairs across state borders, we start with a county-year panel of library variables and census covariates. The original library survey data identified library location by state and place name, so we match place names to counties using the place name list from the Federal Information Processing Standards (FIPS) 55 (U.S. Dept of Commerce ICPSR 8346). We then use shape files of historical county boundary definitions downloaded from Newberry Library (2012) to identify all contiguous county pairs that straddled state borders, at five-year intervals from 1880 to 1930. Because county definitions changed over time through both mergers and splits, we restrict our sample to counties that are consistently defined "singleton" counties throughout our period using the county longitudinal template compiled by Horan and Hargis (ICPSR 6576), which identifies the counties that need to be aggregated in each Census year to be consistent with counties as of the 1990 Census.

An important caveat about the Horan template is that it generally ignores minor boundary shifts. A large percentage of county borders remained quite stable after 1870, although the unstable counties were disproportionately located in the younger, "frontier" states. Thus our county pair data set suffers from two potential sources of bias: (1) measurement error introduced when a

⁸ Details on the sources and coding schemes for the state library institutions are available in an appendix from the authors.

change in county borders shifted some communities into different counties; and (2) selection bias introduced by excluding counties that split or merged and were thus not “singleton” counties in the Horan template.

6. Results

Table 2 provides basic summary statistics for our data. The upper panel is for the full estimating sample, combining all years and county pairs. Perhaps more informative is the lower panel, which provides means of the variables at benchmark dates for the counties used in estimation (each county is counted just once here). The first six rows of the lower panel show the spread of public libraries in these border counties during the five decades of the sample. The library variables are reported for the data based on all public libraries reported in each survey (all), and for the data restricted to libraries with at least 3000 volumes (3000+). The number of places reporting a public library more than doubled over the sample period, and the number of volumes per capita increased about ten-fold. As of 1929, in the average county there was about one place with a public library for every 20,000 population.

Examining the demographic controls, it is clear that while the period witnessed a trend toward greater urbanization, the counties in our sample remained overwhelmingly rural: as late as 1929, the average county had less than a third of its residents in places with populations over 2500. The proportion living in cities of 25,000 or more had reached only 11%. The proportion foreign-born variable suggests that the representation of immigrants was falling in these counties over the period. This probably reflects the fact that the populating of these farming counties by early waves of European migrants from Germany or Scandinavia was largely complete by the late 1800s, with native-born natural increase becoming more important thereafter.

Table 3 presents regression estimates of the effect of state library associations on several alternative outcome measures; Table 4 presents analogous estimates for the effect of library commissions. In the first two columns in each table, the dependent variable is the number of communities with at least one public library per capita (actually per 10,000 population), for all surveyed libraries and for libraries with at least 3000 volumes. Columns (3) and (4) use the number of such places per square mile as the dependent variable, and columns (5) and (6) the number of volumes per capita.

Both the association and commission variables have a positive and significant effect on the number of communities with libraries per capita (columns 1 and 2). To gauge the magnitude of these effects, consider a simple counterfactual. Over the sample period, the actual number of places with libraries per 10,000 population increased by 0.3 for the average county (Table 2, first or second row of Panel B), while the years of exposure to a library association increased by a little more than 30 (Table 2, Panel B). Using the coefficient of roughly 0.01 from column (1) or (2) of Table 3, the observed increase in years of exposure to a library association would have resulted in a predicted increase of about $0.3 = 0.01 \times 30$ public libraries per 10,000, *accounting for the entire observed increase* in public libraries in our sample. The estimated impact of library commissions in

columns (1) and (2) of Table 4 is also large and significant, although only about 2/3 the magnitude of the association effect.

Examining the results using the alternative dependent variables in columns (3)-(6) of the tables reveals mixed results. For the libraries per square mile variable (columns 3 and 4), the impact of library associations is positive and significant (Table 3), but the effect of state commissions is not statistically significant. In none of the specifications is the effect of associations or commissions on volumes per capita statistically significant (columns 5 and 6).

To the extent that library promotion by state associations and commissions focused on encouraging local governments to establish public libraries, the size and significance of the estimated effects in columns (1) and (2) of the tables are supportive of the hypothesis that these institutions were effective, and especially in the case of associations, substantially effective. The absence of any significant effect on volumes per capita is less supportive of an impact for these state institutions, although it is consistent with the idea that library boosters were more interested in establishing libraries than in helping them grow once established.

Given the full set of county and pair-year fixed effects, it is not surprising that the coefficients on the demographic and urbanization controls tend to be estimated imprecisely and are unstable across specifications. These variables are time varying, but move only slowly from year to year. To the extent that there are some consistent patterns, they suggest that library services were positively associated with the presence of small towns (2500+) but also negatively with larger cities (25,000+), once we control for small-scale urbanization. In these regressions, proportion female and proportion foreign-born do not have consistent effects on library development.⁹

7. Conclusion

Our estimates suggest that state-level initiatives to promote local public libraries had a positive and significant impact on library development, as measured by the number of communities in a county with a public library. Of course, as we have argued above and elsewhere, 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 that state-level library boosterism accelerated the pace of local library development during this critical phase of the public library movement. In future work, we hope to make use of our border-county identification strategy and the impact of library associations and commissions to help identify the impact of public libraries on various political and economic variables of interest.

⁹ This null finding contrasts with the results we obtain in our state-level panel, which suggests a positive relationship between immigrants and library development (Kevane and Sundstrom 2012).

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Table 1: Years of establishment of state library associations and commissions

	assoc	comm		assoc	comm		assoc	comm
AL	1904	1907	KY	1907	1910	ND	1906	1907
AK	1897		LA	1910	1920	OH	1895	1895
AZ	1926		ME	1891	1895	OK	1907	1919
AR	1911	1913	MD	1923	1902	OR	1909	1905
CA	1893	1903	MA	1890	1890	PA	1901	1899
CO	1892	1899	MI	1891	1891	RI	1903	
CT	1891	1893	MN	1891	1899	SC	1915	1929
DE	1934	1901	MS	1909	1926	SD	1904	1913
DC	1894		MO	1900	1907	TN	1902	1909
FL	1901	1925	MT	1906	1929	TX	1902	1909
GA	1897	1897	NE	1895	1896	UT	1912	1907
HI	1922	1959	NV	1946	1915	VT	1893	1894
ID	1909	1901	NH	1889	1892	VA	1905	1904
IL	1896	1909	NJ	1890	1896	WA	1909	1903
IN	1891	1899	NM	1923	1929	WV	1914	1929
IA	1890	1900	NY	1890	1891	WI	1891	1895
KS	1891	1899	NC	1904	1909	WY	1891	

Table 2: Summary statistics for border-county panel*Panel A: Full estimating sample (panel)*

	Mean	Std. Dev.	Min	Max
Places with public library, per 10,000 pop. (all)	0.478	0.911	0.000	7.715
Places with public library, per 10,000 pop. (3000+)	0.328	0.643	0.000	6.452
Places with public library, per 100 sq. mi. (all)	0.413	1.099	0.000	23.365
Places with public library, per 100 sq. mi. (3000+)	0.309	0.948	0.000	23.365
Volumes in public libraries, per 10,000 pop. (all)	3242.8	9088.3	0.0	348559.7
Volumes in public libraries, per 10,000 pop. (3000+)	2918.2	8707.8	0.0	348559.7
Years with library association	10.544	11.722	0.000	41.000
Years with library commission	8.126	10.240	0.000	40.000
Proportion of population urban (2500+)	0.212	0.261	0.000	1.030
Proportion in city 25,000+	0.073	0.210	0.000	1.131
Proportion female	0.486	0.025	0.201	0.540
Proportion foreign born	0.088	0.095	0.000	0.629

Panel B: Means by year

	1880	1890	1900	1910	1920	1929
Places with public library, per 10,000 pop. (all)	0.305	0.371	0.470	0.521	0.568	0.606
Places with public library, per 10,000 pop. (3000+)	0.180	0.214	0.295	0.365	0.432	0.483
Places with public library, per 100 sq. mi. (all)	0.229	0.299	0.414	0.463	0.503	0.544
Places with public library, per 100 sq. mi. (3000+)	0.151	0.206	0.293	0.352	0.400	0.448
Volumes in public libraries, per 10,000 pop. (all)	761.4	1239.5	2096.5	3580.1	5576.8	7574.0
Volumes in public libraries, per 10,000 pop. (3000+)	704.6	1105.4	1854.5	3178.9	5032.2	6890.7
Years with library association	0.000	0.171	4.654	12.492	21.832	30.579
Years with library commission	0.000	0.019	2.277	8.856	17.966	26.462
Proportion of population urban (2500+)	0.132	0.172	0.202	0.233	0.258	0.275
Proportion in city 25,000+	0.036	0.050	0.067	0.079	0.097	0.109
Proportion female	0.484	0.485	0.486	0.484	0.488	0.488
Proportion foreign born	0.106	0.104	0.089	0.087	0.072	0.058

"All" includes public libraries of any size, with threshold changing across surveys

"3000+" restricts library counts to libraries reporting at least 3000 volumes in survey

Sources: Samples of U.S. Dept of Education library surveys (see text); ICPSR 2896 (Haines/ICPSR 2010)

Table 3: Effect of state library associations on public library development
Library panel regressions, state border county pairs, 1880-1930

	(1)	(2)	(3)	(4)	(5)	(6)
	Places with library per 10,000 pop (all)	Places with library per 10,000 pop (3000)	Places with library per 100 sq mi (all)	Places with library per 100 sq mi (3000)	Volumes per 10,000 pop (all)	Volumes per 10,000 pop (3000)
Years with library association	0.0103*** (0.00171)	0.0110*** (0.00160)	0.00210* (0.00123)	0.00298*** (0.00113)	34.90 (40.81)	27.31 (41.44)
Proportion of population urban (2500+)	0.120 (0.124)	0.0353 (0.107)	0.521*** (0.142)	0.373*** (0.137)	5,425.0 (1,248)	4,370.0 (1,141)
Proportion in city 25,000+	-0.436*** (0.0793)	-0.406*** (0.0692)	-0.660* (0.358)	-0.679* (0.391)	-3,769.0 (1,323)	-2,842.0 (1,300)
Proportion female	-0.388 (0.537)	-0.328 (0.470)	0.0173 (0.285)	0.219 (0.251)	18,994 (26,256)	16,411 (26,376)
Proportion foreign born	-0.462 (0.395)	0.252 (0.359)	-0.654 (0.438)	-0.309 (0.462)	17,333 (14,180)	16,816 (14,042)
Observations	59,200	59,200	59,200	59,200	59,200	59,200
R-squared	0.858	0.734	0.895	0.863	0.489	0.484
Number of pair-year fixed effects	29,600	29,600	29,600	29,600	29,600	29,600

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

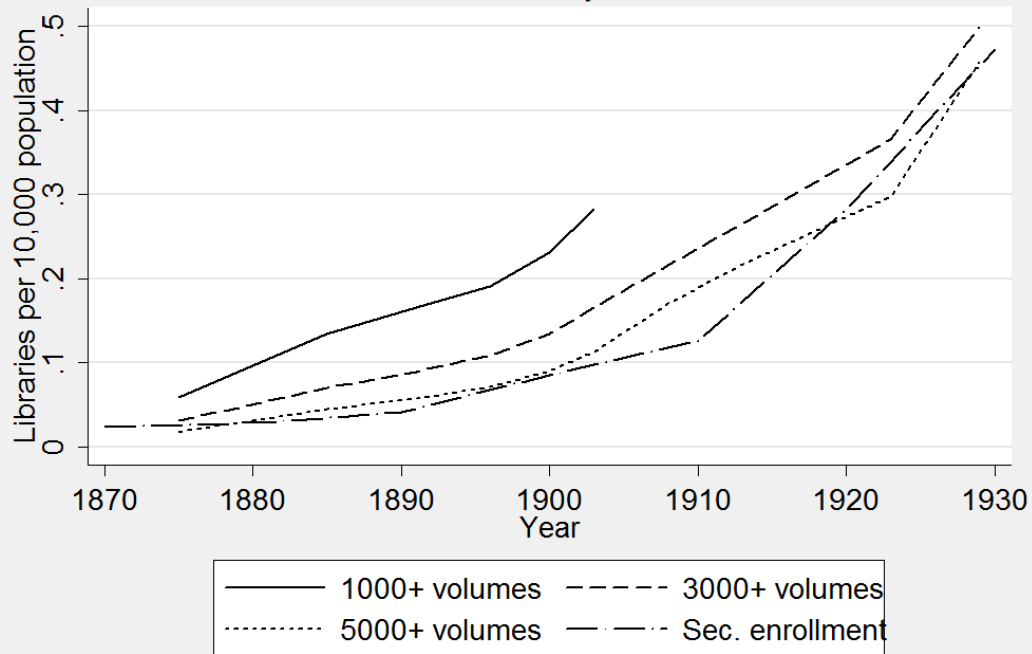
Table 4: Effect of state library commissions on public library development
Library panel regressions, state border county pairs, 1880-1930

	(1)	(2)	(3)	(4)	(5)	(6)
	Places with library per 10,000 pop (all)	Places with library per 10,000 pop (3000)	Places with library per 100 sq mi (all)	Places with library per 100 sq mi (3000)	Volumes per 10,000 pop (all)	Volumes per 10,000 pop (3000)
Years with library commission	0.00649*** (0.00140)	0.00693*** (0.00137)	-0.000193 (0.00150)	-9.86e-05 (0.00156)	9.817 (39.14)	4.537 (39.43)
Proportion of population urban (2500+)	0.132 (0.125)	0.0477 (0.107)	0.525*** (0.142)	0.378*** (0.138)	5,477*** (1,261)	4,414*** (1,152)
Proportion in city 25,000+	-0.444*** (0.0784)	-0.415*** (0.0682)	-0.664* (0.358)	-0.684* (0.392)	-3,817*** (1,313)	-2,885** (1,291)
Proportion female	-0.615 (0.555)	-0.570 (0.488)	-0.0464 (0.284)	0.131 (0.252)	18,085 (26,428)	15,663 (26,572)
Proportion foreign born	-0.513 (0.403)	0.197 (0.367)	-0.679 (0.445)	-0.344 (0.471)	17,038 (14,224)	16,553 (14,084)
Observations	59,200	59,200	59,200	59,200	59,200	59,200
R-squared	0.858	0.734	0.895	0.863	0.489	0.484
Number of pair-year fixed effects	29,600	29,600	29,600	29,600	29,600	29,600

Robust standard errors in parentheses

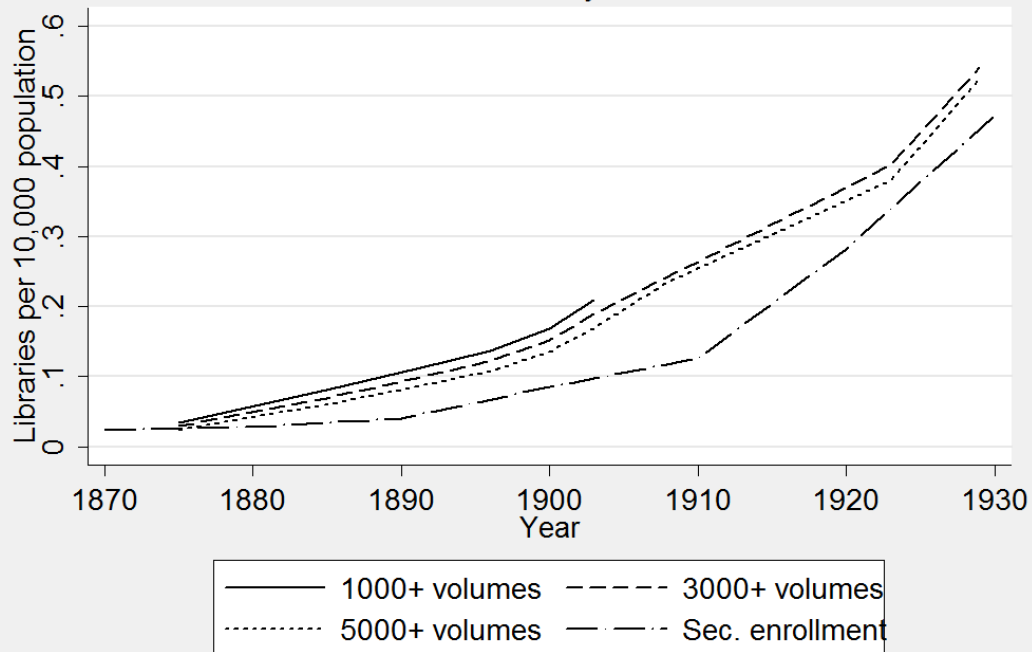
*** p<0.01, ** p<0.05, * p<0.1

Fig. 1: Public libraries per 10,000 population
Plotted with secondary enrollment rate



Narrow definition of public library. Branches counted as separate libraries. Source: see text.

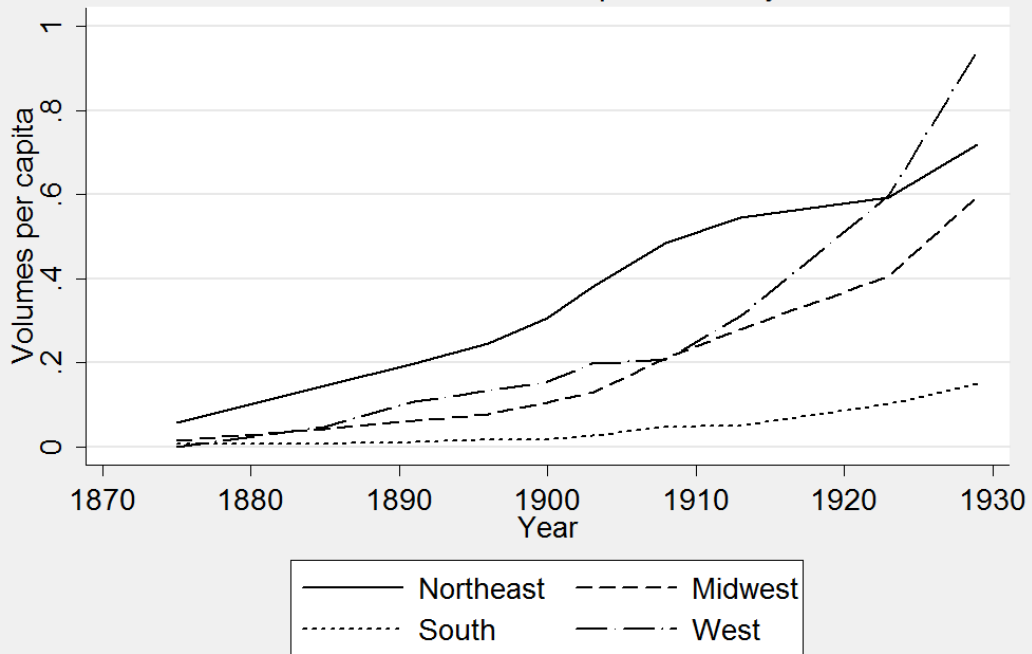
Fig. 2: Volumes in public libraries per capita
Plotted with secondary enrollment rate



Narrow definition of public library. Source: see text.

Fig. 3: Volumes per capita by region

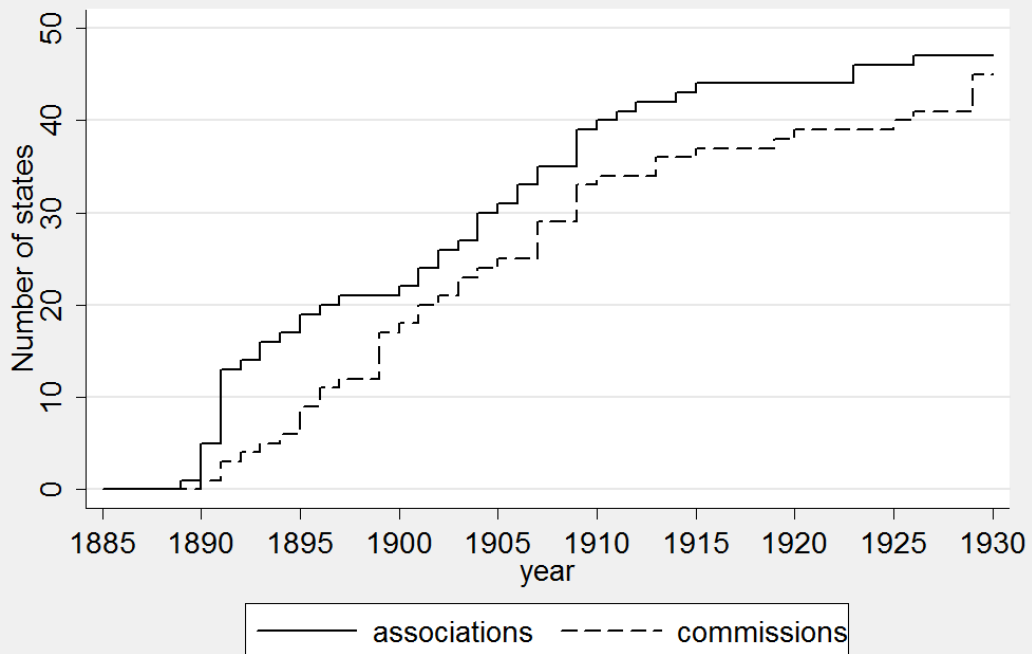
Narrow definition of public library



Libraries with at least 5000 volumes, topcoded. Source: U.S. Bureau of Education (see text)

Fig. 4: State library associations and commissions

Cumulative number of states



Source: See text.