The externalities of missionary activity: Tracing the Pre-independence Origins of Kerala's Comparative Literacy Advantage*

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Abstract

The direct effects of missionary activity are well documented. Missionaries also constituted a powerful interest group, creating externalities in the form of institutional reform. We test this argument using novel sub-district panel data for polities that today compose South India. Differential literacy gains in the princely states of Travancore and Cochin during the early decades of the twentieth century align temporally with the institutional reforms pursued by these states and not missionary educational efforts dating back to the early nineteenth century. To document the institutional mechanism, we analyze original panel data on supply, demand, and financing of these educational efforts. Travancore and Cochin made primary education free and increased capacity. Women and Hindus saw the largest gains in literacy. Together, these findings suggest that research on the political economy of missionary activity should pay greater attention to the externalities of missionary activities.

JEL classification: H75, N35, Z12

Keywords: colonialism; India; Kerala; missionaries; institutional change; education

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1 Introduction

Growing evidence suggests that colonial-era missionary activity had significant socioeconomic consequences in areas where they operated. While the literature has focused on schools, hospitals, and other direct missionary investments, another avenue remains unstudied: the *externalities* of missionary activity. Disentangling these indirect effects of missionary activity from the direct effects will improve our understanding of how missionaries have shaped economic and political outcomes globally.

In this paper, we argue and provide evidence for the impact of missionaries beyond their direct provision of goods, services, and administration. Missionaries did not exist in a political vacuum and carried considerable power as political actors. Close links to the colonial power positioned them in a unique interlocutory role, with access to both colonial administrators and native rulers. Given that missionary proselytizing often found most receptivity among members of the socioeconomically disadvantaged, their efforts to champion the causes of these groups catalyzed social and institutional change. However, under colonialism, native rulers were unable to expel missionaries despite the threat they posed to the status quo. Missionary politicking proved most effective under a particular political opportunity structure. Specifically, missionary-induced institutional change occurred in native polities with policy-making autonomy granted by the paramount power and experiencing salient social issues that could be politicized.

To examine the externalities of missionary activity, we focus on educational outcomes in colonial South India from the 1850s to the 1930s. This region and time period offer several features that allow us to separate externalities from the direct effects of missionary activity. During this period, South India consisted of both areas under direct British rule (the Madras Presidency) and areas governed by local rulers (the largest being the princely states of Travancore, Cochin, and Mysore). Though missionary presence was ubiquitous, their influence varied across these polities; we leverage this heterogeneity in our analyses. This period also marked the start of significant mass education in South India. Fine-

grained data allow us to empirically assess whether missionary presence directly (e.g., missionary schools) or institutional reform (e.g., free primary education), spurred by the presence of the missionaries as political actors, produced such educational gains.

Multiple results are worth highlighting. Despite decades of missionary activity in colonial South India, the Madras Presidency, Travancore, and Cochin reported roughly similar levels of literacy around 1880. Using qualitative evidence from primary and secondary sources, we document that while missionaries were engaged in widespread lobbying, they were only able to effect institutional change in areas with a particular political opportunity structure that combined policy-making autonomy and salient social tensions. From here, we trace out the princely states' large literacy gains compared to the Madras Presidency throughout the early decades of the twentieth century. We show that these gains are evident not only in our full sample but also in a more restrictive sample that only includes districts (and even more restrictively, sub-districts) along the shared borders of the three polities. The timing of the literacy gains in these two princely states corresponds with institutional reforms resulting from internal and external pressures including missionary lobbying for greater educational resources.

To better understand what drives these gains in education we ask and answer three questions: who was providing education, for whom, and how.

Who was educating the population? We provide evidence for the growing and dominant role of the state in bringing education to the masses in both Travancore and Cochin, where missionaries lobbied for policies to expand educational opportunities for the public. While the missionaries directly provided some education, the state and other indigenous institutions spearheaded mass education in these princely states. Furthermore, in princely states where political conditions did not allow missionaries lobbying power, we do not find evidence for a similar takeoff in education.

Who was getting educated? We examine changes in literacy by gender, religion, and age-groups. Literacy gains are particularly marked among women, who given a lower baseline

stood to gain more from systemic institutional reform. Differential literacy gains (compared to the Madras Presidency) only materialize among Hindus (both men and women). While the higher literacy levels among Christians speak in part to missionary efforts, the lack of differential gains among Christians in Travancore suggest that missionary activity cannot explain the trajectory of the state. Finally, results by age-group bolster the idea that institutional reform is driving such changes, with older uneducated members being replaced by young educated individuals over time.

Who financed the education? We document year-to-year changes in the educational spending of these polities to assess whether the state's financial backing of education facilitated the transformation of the educational landscape in the princely states. Outlays earmarked for education in the princely states – both for grant-in-aid and government-controlled institutions – outpaced increased educational spending pursued by the Madras Presidency. We find that while the princely states did not necessarily spend more per student enrolled, they did spend substantially more per capita.

We make several contributions to political economy generally, the political economy of colonialism, and the economic history of India specifically. First, we examine further roles of missionaries in colonial political economies. We empirically disentangle the role of missionaries as a *direct* source of educational attainment through missionary schools from their *indirect* impact on institutional reform (Lankina and Getachew 2012). Prior work on the long-run effects of missionary activities has focused on the location and direct actions of missionaries (Calvi, Hoehn-Velasco, and Mantovanelli 2022; Calvi and Mantovanelli 2018; Cole 1961; Dulay 2022; Gallego and Woodberry 2010; Valencia Caicedo 2019; Waldinger 2017; Wietzke 2015). Unlike missionary activity in colonial Africa, missionaries in India were neither the primary provider of education nor markedly successful at conversion (Nunn 2010).

Second, we provide a systematic assessment of the different explanations for Kerala's advantage using unique, newly digitized sub-district data covering the late nineteenth

century through 1931 alongside data on missionaries and historical evidence on education in the areas that would become Kerala and its neighbors. Several articles have detailed the role of Christian missionaries in bringing about educational reform in India, with a particular emphasis on the evolution of education policy within Travancore State (Kooiman 2013; Lankina and Getachew 2012, 2013; Nair 1976). We argue that missionaries' efforts to raise overall education and the synergies in a handful of locations with local, *non-British* rulers laid the groundwork for long-run educational growth in Kerala. Our results directly address the famous Kerala puzzle as articulated by Amartya Sen (1992).

Third, we add to research that has highlighted the heterogeneity of policies and outcomes within colonies. For example, the canonical paper on local policies in colonial India, Banerjee and Iyer 2005, finds large, long-standing effects of land tenure type on contemporary outcomes. With only a few exceptions (e.g., Iyer 2010), existing quantitative work has largely ignored princely states and the differences among them. Sub-district data allow us to explore heterogeneity across some of the larger princely states that composed colonial South India.

Fourth, we speak to work on the political economy of education provision (Chaudhary 2009; Chaudhary and Rubin 2016). Our findings are consistent with the argument that states expanded education as a state-building tool (Paglayan 2021, 2022). Faced with missionary lobbying and social unrest with roots in missionary activity, princely states responded by pursuing education reform which allowed them to standardize curricula and over time increase direct provision of education.

Fifth, our data effort to identify, digitize, and analyze unique, highly granular, panel data on colonial India makes several contributions – detailed in Section 3 – to the economic history of colonial India. To our knowledge, this is the first paper in economics or political science to use sub-district data to answer questions of colonial political economy.

The paper proceeds as follows. The next section develops our conceptual framework. Section 3 provides background on missionary activity and education policy in colonial

South India during the nineteenth and early twentieth centuries. Section 4 describes our numerous data sources and details the empirical strategy. We document our results in Section 5 before providing mechanism evidence in Section 6. Section 7 adjudicates among existing explanations and Section 8 concludes.

2 Missionaries as political actors

Colonial Christian missionaries were neither apolitical nor disconnected from the larger colonial political economy (Smith 2017; Wietzke 2023). However, prior work has often situated missionaries outside of politics or posited that missionaries were merely pawns of imperialism (Porter 1997). While some work has examined missionaries as agents interacting with other groups, the emphasis there has largely been on inter-religious competition (Gallego and Woodberry 2010; Lankina and Getachew 2013). Thus, missionaries as separate political actors embedded within colonial states are under-theorized. The remainder of this section discusses how missionaries, as political actors, influenced colonial political economy.

The primary missionary motivation was conversion, but the opportunities afforded to missionaries for conversion varied across contexts. A key factor was the relationship of missionaries to governments at multiple levels, including areas ruled by native intermediaries, the colonial state, and even up to the metropole. Although some missionaries operated under the aegis of the state, many did not (Woodberry 2004). Occasionally, missionary activity bolstered colonial governments; for instance, information from missionary stations could assist in areas with weak state capacity. However, missionaries and states diverged in other cases over missionary actions.

First, in some cases, missionaries—as agents with their own incentives—clashed with native and colonial political elites. Missionary efforts at converting did not always align with the local political economy and could instead create social unrest. Although they did

not always choose to do so, missionaries could side with less powerful groups in exchange for greater influence and opportunities to increase proselytization. When missionary activity was disruptive to the local political economy, missionaries encountered actions designed to curb their activity, including expulsion and state-sanctioned violence.[1] However, missionaries were sometimes able to counter state hostility with their own responses reminiscent of special interest groups (Grossman and Helpman 2001). Lobbying at multiple levels of government was a prominent strategy for missionaries to effect their preferred changes (Woodberry 2004). Sometimes lobbying focused on high-level changes in the metropole (C. D. Rice 1982). At other times, a multi-pronged strategy with successful lobbying in the metropole could lead to local lobbying of colonial officials as well.

Second, missionaries could threaten the status quo through a core part of their mission work: the provision of public goods. Missionaries were often key providers, and sometimes the only providers, of education and healthcare. For instance, the term "medical missionary" dates from at least the early nineteenth century when European and American missionary activity grew rapidly (Good 1991). The creation of parallel missionary infrastructure presented further challenges, such as crowding out other institutions and creating dependence on missionary expertise.

The form of local administration shaped the local opportunity structure and the importance of the missionary-state tensions. In areas directly ruled by colonizing authorities, the missionaries imposed costs on and made demands of the same authority. Missionary incentives and actions may have even inhibited and weakened colonial authority, which led to friction as missionaries lobbied for change and conditions conducive to missionary activities.

Non-colonized polities had greater latitude to make their own policies regarding missionaries. They used missionaries while curtailing their further activities and circumventing missionary-induced changes (Schendel 1999). However, local ruling elites under

1. In the case of Rev. John Smith, the so-called "Demerara Martyr," a British Crown Colony sentenced to death a missionary working among enslaved people (Da Costa 1994).

colonial governance—whose position of authority depended on their relations with the paramount, colonizing power—varied in their abilities to restrict missionaries. Cases where the paramount power propped up weak local polities were effectively the same as areas directly ruled by the paramount power. Missionary actions on the ground directly affected the colonial power behind weak local elites. Missionaries thus lobbied the paramount power directly for change.

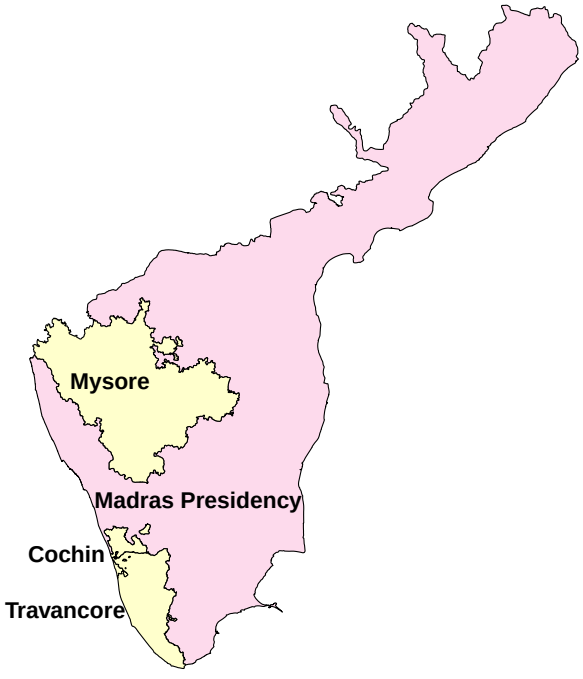
In other cases, local intermediaries had more latitude to make policy but accordingly faced greater pressure. Missionaries could be more successful at winning the political reforms they desired in these cases because they lobbied beyond the scope of local intermediaries. Higher-level, European colonial authorities, who internalized possible positive externalities of missionaries (e.g., a healthier labor force treated by medical missionaries) without bearing the costs (e.g., social unrest), were possibly more receptive to missionary lobbying. In these cases, local intermediaries were forced to accommodate missionary policies while also trying to protect their own power base.

Overall, a feedback loop existed between missionaries and local politics. Missionaries responded to the prevailing opportunity structures determined by the local political context, not all of which were conducive to conversion and other missionary activities. For the colonial state, missionaries provided a useful example of the evolving justification for colonialism as a 'civilizing mission' (Fischer-Tiné and Mann 2004), and missionaries sometimes did provide material assistance. Missionaries were also useful as representatives of the 'civilizing mission' in areas where their actions did not impose direct costs on colonialism, such as areas under indirect rule by local elites. However, missionary actions also could undermine colonial authority and create more widespread problems. How the state reacted to missionaries affected the latter's ability to continue mission work, including opportunities for conversion, and their subsequent actions.

3 Background

In 1858, the territories controlled by the British East India Company came under direct control of the British Crown. The nature of British administration across the Indian subcontinent varied by region. While a substantial share of the subcontinent saw "direct rule," several native states were also allowed a certain degree of autonomy through "indirect rule" under the British paramount power (Banerjee and Iyer 2005). In South India, the focus of this paper, areas that today form a significant share of the states Tamil Nadu, Andhra Pradesh, and Orissa belonged to the directly administered region referred to as the Madras Presidency. However, significant territory was also ruled by the kings of native states like Cochin, Travancore, and Mysore (**Figure 1**). Contemporary Kerala was divided between three administrations: much of the southern half of the state was part of the Travancore kingdom, the center was formed from both Cochin and Travancore states, and the north was part of the Madras Presidency.

Figure 1: Larger polities of colonial South India



Notes: Pondicherry (French), Coorg (British), and the three princely states of Banganapalle, Pudukkottai, and Sandur, which are landlocked within the Madras Presidency, not shown.

The coexistence of direct-rule areas and princely states in South India stemmed from the first phases of European expansion in India. Although confined to coastal trading posts and forts at first, the British East India Company eventually formed alliances with local rulers against other European and local powers while also acquiring new territory through military conquest. The long-running Anglo-Mysore Wars, four wars fought between 1767 and 1799, pitted the British and their key allies—including Travancore and Hyderabad states—against the Kingdom of Mysore and its French allies. With the final defeat of Mysore in 1799, key borders that had been determined by military alliances were largely locked in place until India became independent in 1947 (Washbrook 1976).

The Anglo-Mysore Wars and subsequent episodes of internal strife made the princely states of Travancore and Cochin heavily dependent on British protection (Carson 2013, 141). This together with persistent concern that the British might annex their kingdoms by asserting administrative inadequacy made the rulers of these polities highly pliable to pressure from the British administration (Carson 2013; Desai 2005; Nair 1976). Missionary groups also enjoyed significant influence in these polities given their affiliation and influence with the British paramount power (Desai 2005, 477). Colonial officials in the Madras Presidency, being part of the colonial administration, and princely states like Mysore which operated with significantly less agency compared to Travancore and Cochin, did not face the same calculus when facing missionary demands (Desai 2005). This geopolitical context is crucial for understanding the evolution of educational policy in South India during the nineteenth and twentieth centuries.

At the start of the nineteenth century, neither the British nor the native states prioritized education or investments in human capital (Sengupta 2011). The native states pursued no systemic educational reforms until the second half of the century (Aiya 1906b, 453). Prior to then, heads of state provided land grants and other individualized support for specific schools at the behest of the British resident or missionaries (Aiya 1906b). Meanwhile, European missionaries became increasingly active in India around the late

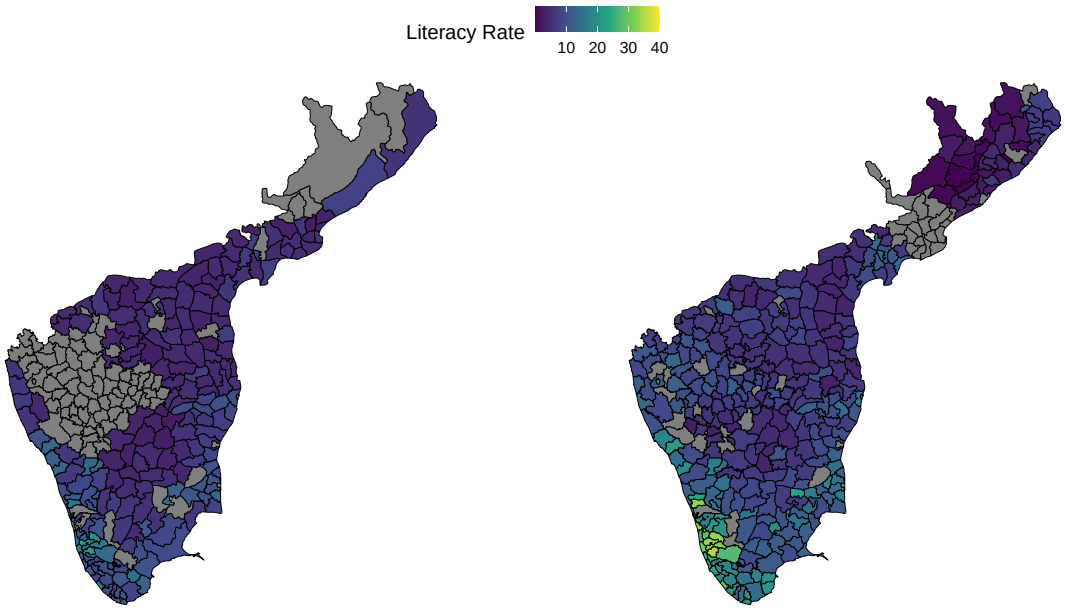
18th century (Frykenberg 2013, 47). They wanted to proselytize and found socioeconomically disadvantaged members of society especially open to their appeals (Desai 2005, 478). Protestant missionaries emphasized education because they wanted their congregants be able to read the Bible (Becker and Woessmann 2009; Ramachandran 1997; Tharakan 1984). Efforts by European missionaries resulted in growing conversions and social unrest, introducing instability to the status quo (Carson 2013; Menon 1878).

However, given the dependent colonial relationship outlined above, not only could native states not expel missionaries but they also had to respond to missionary demands. For example, petitions by the London Missionary Society along with coordinated political pressure from the Madras Presidency resulted in Travancore providing financial support for primary schools through a grant-in-aid program (Kooiman 1989, 92). A confluence of internal and external pressures spurred institutional reforms. Internally, the state was responding to threats of conversion from members of lower castes who demanded better social policy (Lankina and Getachew 2013, 116) and lobbying by high-caste Hindus to stem low-caste conversion to Christianity (Desai 2005, 472). Over time, missionary efforts contributed to feedback loops in the form of social movements, wherein members of lower castes with improved exit options (both through conversion to Christianity and improved educational achievement through missionary schools) successfully lobbied the state for educational reform (Tharakan 1984, 1962). Externally, pressure to reform arose from constant lobbying directed at both native rulers and the paramount power by missionaries seeking to modernize the state on behalf of themselves and the lower castes (Mateer 1883; Desai 2005, 460, 477).

In Travancore, the first major reform was undertaken in 1869, with the launch of the grant-in-aid program for vernacular schools. Under this program, which was continually expanded over the coming decades, private schools became eligible for government support if they pursued the same curriculum as the state schools and employed only qualified teachers (Aiya 1906b, 456). In 1871, the state government embarked on the

ambitious plan of opening one school in every village in the state. Per this plan, the state agreed to provide funding for teaching materials if the villagers provided a school building (Pillai 1940, 704). District schools were opened to some "backward" classes in 1873, with further improvements in caste-based access being implemented in 1894, 1904, and 1910 (718). Reforms to the educational code in 1909-10 also saw the provision of state funds to night schools, allowing educational access to older working cohorts (Desai 2005, 472). While the state began reducing and eliminating fees in village schools in 1892, it was only in 1904 that it made a commitment to free primary education for all children (Pillai 1940, 716). The state continued to enact educational reforms throughout the 1910s and 1920s. Many of these reforms, guided by similar internal and external pressures, was also pursued by neighboring Cochin starting in 1889 (Koji 1994).

Figure 2: Taluk-level (sub-district) literacy rates across South India 1901 – 1931



Notes: Incomplete. The authors are currently working on completing the necessary shapefiles.

As shown in **Figure** 2, literacy rates grew rapidly in the princely states of Travancore and Cochin during the first half of the twentieth century (Koji 1994; Tharakan 1984). Although missionaries did directly provide some schooling, the primary driver of this

rapid growth in literacy was the downstream externality of missionary activities. Disentangling these pathways requires careful attention to the timing of institutional reforms. Given that the educational efforts of the missionaries in Travancore and Cochin date back to the early nineteenth century, differential literacy gains resulting from direct missionary schooling should be visible from the mid-nineteenth century onward. Meanwhile, if such gains resulted primarily from missionary-induced educational reform, they should only appear in the data after the state began implementing such reforms.

4 Data & Empirical Strategy

To examine missionary externalities and educational changes in south India, we bring together novel data from a range of government and educational sources for our three primary polities of Madras, Travancore, and Cochin.

Our primary dataset for analysis is a newly digitized taluk-level (subdistrict-level) panel of population and educational outcomes based on decennial census data. We focus on the stock measure of literacy as a key outcome. Travancore and Cochin both conducted their first censuses with taluk-level education data in 1875. The Madras Presidency's first censuses with clear education data date back to 1871 and 1881, although the data were not collected at the taluk level in 1871 and the 1881 data do not disaggregate literacy by gender. All three began collecting more consistent taluk-level data starting in 1891, which forms the base comparison year in our analyses. Madras and Travancore have population and literacy rates by gender for all five censuses in the span 1891-1931, and Cochin has four (1891, 1901, 1921, and 1931). We also digitize literacy by age group and religion when available for all three polities (1891, 1901, and 1931).

Because taluk and district boundaries changed over the period covered by our data, we also create fine-grained shapefiles for the polities of colonial South India.[2]

To supplement our primary census-level data, we construct several panel datasets

2. In a future draft we will spatially re-weight data to use consistent 1891 boundaries.

from official state administrative reports for Madras, Travancore, and Cochin. We collect state-level education expenditure and general public finance statistics. These data capture changes in educational financing in the wake of institutional reforms. We also collect state-level student enrollment statistics. While early reports did not cover private schools, institutional reforms in education and administration brought greater coverage of schools and enrollment over time. For Travancore specifically, we construct a taluk-level panel dataset of student enrollment, allowing us to trace the flow of human capital in addition to the stock measure of literacy rates as a measure of a society's human capital.

To assess the *direct* effect of missionaries, we construct annual panels (1860 – 1920) of missionary schools and students for the three largest missionary groups in south India: the Basel Mission, the Church Missionary Society (CMS), and the London Missionary Society (LMS). The CMS and the LMS were effectively the only missionary groups in Travancore (Koji 1994), while the CMS was effectively the only group in Cochin. Both were also present in the Madras Presidency and played large roles in education there. Finally, the Basel Mission was active in the Madras Presidency in areas bordering Travancore and Cochin.

We supplement these three principal polities with several more south Indian locations in robustness checks to delve further into direct versus indirect rule. Hyderabad and Mysore, two of the major polities in the Anglo-Mysore Wars, were also two of the largest princely states in all of British India. Though neither overlapped with modern-day Kerala, both bordered the Madras Presidency. Mysore fell under direct British rule for most of the nineteenth century before returning to princely rule in the 1880s. Coorg was a princely state adjacent to the Madras Presidency until its annexation in 1834. It retained its own administration separate from the Madras Presidency, and it was also a location in which the Basel mission operated (B. L. Rice 1884).

We begin by reporting literacy rates in each polity from the earliest year for which we have data (**Table** 1). We use the 1891 census as our baseline for three reasons. First, this

is the first census fielded simultaneously across all areas of the Indian subcontinent. The previous census in Travancore and Cochin was conducted in 1875 while the Madras Presidency statistics come from 1881. Second, census enumerators for Cochin State recorded concerns of systematic literacy under reporting in the 1875 census (Jeffrey 1987). Third, 1891 is the earliest year for which we have taluk-level shapefiles.

We report results from analyzing three samples. The first utilizes the broadest sample consisting of all taluks in Cochin, the Madras Presidency, and Travancore plus nearby Coorg (British) and Mysore (princely) ($N = 1,655$). To address the concern that districts further away from Travancore and Cochin might not serve as appropriate comparison units (due to differences in geographic, climatic, linguistic, and sociocultural features), the second sample is restricted to Cochin and Travancore plus taluks in districts from the Madras Presidency that are immediately adjacent to these princely states ($N = 407$). Finally, for an even more restrictive test, the third sample is restricted to taluks along the shared border between Cochin, Travancore, and Madras Presidency ($N = 171$). Though the smallest number of observations, we consider the results from our border-taluk sample as our benchmark results as it provides the most appropriate comparison units.

To assess the divergence in literacy across the polities of colonial South India, we estimate the following ordinary least squares (OLS) specification:

$$Y_{itp} = \beta\ Polity_p \times Year_t + \phi_i + \zeta_t + \epsilon_i \tag{1}$$

where i indexes taluks in colonial India from 1891, t indexes the census year, and p indexes the polity. Y_i indicates our taluk-level outcomes such as the literacy rate. $Polity_p \times Year_t$ is our main explanatory variable, interacting a categorical measure of polity with census year. ζ_t refers to census year fixed-effects that help account for any factors that might have impacted all taluks in a given year. ϕ_i refers to our taluk fixed effects that help account for a wide range of alternative explanations linked to initial conditions. For example, geography (soil quality, climate, ruggedness, distance to coast

Table 1: Taluk summary statistics by census year

	Cochin			Travancore			Madras		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
1891									
Males (000s)	60.32	(31.55)	6	39.1	(16.17)	33	75.24	(44.28)	231
Male literacy (%)	22.21	(4.5)	6	18.45	(6.22)	33	9.67	(5.34)	231
Females (000s)	60.17	(29.78)	6	38.4	(16.26)	33	76.94	(46.85)	231
Female literacy (%)	3.18	(1.67)	6	2.68	(2)	33	0.55	(1.49)	231
Total literacy (%)	12.69	(3.19)	6	10.81	(3.67)	33	5.06	(2.99)	231
1901									
Males (000s)	67.53	(35.9)	6	46.57	(16.8)	32	81.84	(48.32)	230
Male literacy (%)	21.51	(4.05)	6	21.01	(6.58)	32	9.92	(5.77)	230
Females (000s)	67.8	(34)	6	45.69	(16.85)	32	84.13	(50.72)	230
Female literacy (%)	4.23	(1.5)	6	2.96	(1.82)	32	0.69	(1.02)	230
Total literacy (%)	12.85	(2.83)	6	12.11	(4.15)	32	5.23	(3.16)	230
1911									
Males (000s)				52.47	(20.55)	33	81.94	(46.74)	251
Male literacy (%)				24.4	(6.27)	33	11.94	(6.89)	251
Females (000s)				51.44	(20.43)	33	84.57	(49.01)	251
Female literacy (%)				4.74	(2.38)	33	1.21	(2.48)	251
Total literacy (%)				14.7	(4.25)	33	6.48	(4.22)	251
1921									
Males (000s)	80.49	(43.89)	6	67.75	(29.11)	30	84.69	(45.39)	249
Male literacy (%)	26.35	(5.85)	6	31.49	(7.22)	30	13.7	(7.26)	249
Females (000s)	82.69	(42.81)	6	65.78	(28.6)	30	87.08	(47.16)	249
Female literacy (%)	9.5	(2.97)	6	13.26	(6.35)	30	1.98	(3.44)	249
Total literacy (%)	17.83	(4.5)	6	22.54	(6.46)	30	7.75	(4.86)	249
1931									
Males (000s)	98.3	(55.68)	6	85.5	(34.85)	30	90.16	(50.85)	258
Male literacy (%)	35.84	(8.08)	6	32.31	(7.65)	30	13.78	(7.51)	258
Females (000s)	102.53	(55.52)	6	84.36	(35.14)	30	92.46	(52.64)	258
Female literacy (%)	16.78	(5.58)	6	12.38	(5.84)	30	2.07	(2.62)	258
Total literacy (%)	26.11	(6.85)	6	22.44	(6.53)	30	7.84	(4.61)	258

Source: Censuses of British India 1891, 1901, 1911, 1921, and 1931. Cochin lacks taluk-level literacy data in 1911.

etc.) and differential historical state capacity (due to some taluks having been within the boundaries of older polities) cannot explain our findings. ϵ_t is the error term. In the main analysis, we use robust (i.e. Huber-White) standard errors.

5 Results

Missionary activity and some of the minor institutional responses by native rulers to missionary actions were underway prior to 1891, the year of the first census conducted simultaneously across the subcontinent. Despite the absence of simultaneous taluk-level literacy data prior to this date, we can gather a picture of the educational landscape of these polities by collating data from missionary annual reports, asynchronous censuses from 1871, 1875, and 1881, and administrative reports published by individual polities. Our cross-polity comparison of literacy outcomes from this period is summarized under **Table** 2. Literacy rates are low but roughly similar across polities. As noted above, the literacy numbers for Cochin might suffer from under-reporting in 1875. A very small but roughly equal share of the population attended missionary schools during this period. Finally, comparable shares of the school-age population in both Travancore and Madras attended school in 1881.

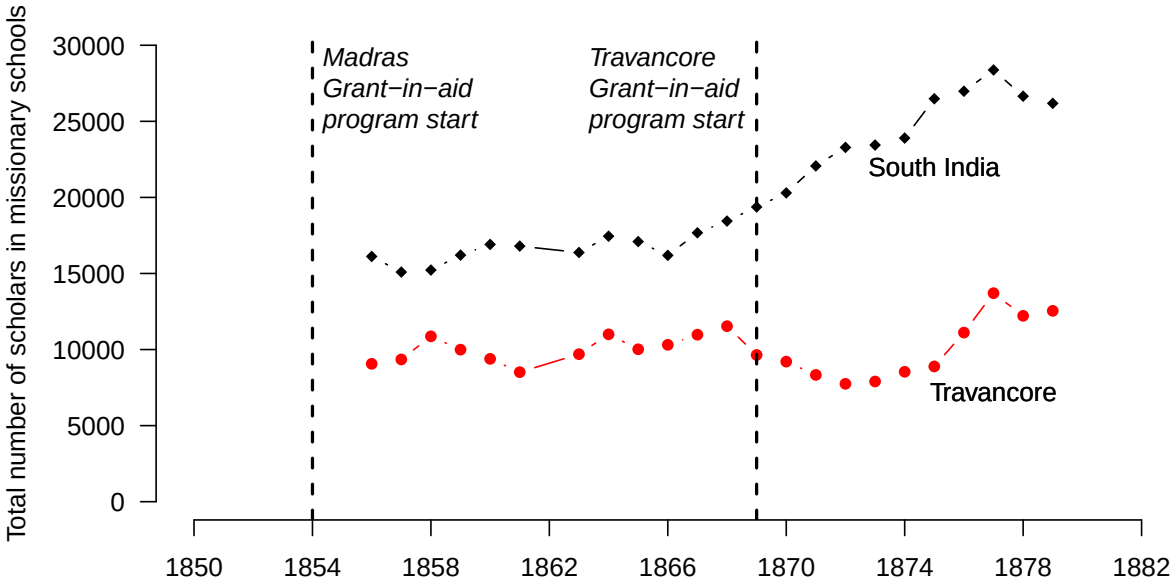
Meanwhile, annual enrollment data for the two largest missionary groups operating in South India during the colonial period – the LMS and the CMS – reveal that enrollment did not grow in Travancore in the decades prior to the major institutional reforms of the late nineteenth century (**Figure** 3). By contrast, missionary enrollment in the rest of South India saw a gradual increase during this period. Regardless, missionary enrollment in 1878 amounted to less than half of a percent of the total population across all three polities (**Table** 2). Taken together, this suggests that all three polities had comparable levels of literacy and missionary activity circa 1880.

Table 2: Educational attributes of colonial South Indian polities circa 1880

	Madras Presidency	Travancore	Cochin
% literate 1871	4.8%	—	—
% literate 1875	—	5.7%	4.4%
% literate 1881	7%	—	—
% total pop in mission schools	0.41%	0.42%	
% school-age in school	5.03%	5.6%	—

Sources: % literate: Madras Presidency (1871 and 1881 censuses), Travancore (1875 census), Cochin (1875 census). See (Chaudhary and Fenske 2023) for a discussion of literacy measures in early Indian censuses. % in mission schools is calculated using school enrollment numbers across all Protestant missions reported in the Missionary Conference 1879. This volume distinguished by a combination of language and polity, and the Madras Presidency value is calculated as a percent of native Tamil speakers reported in the 1881 census. Travancore and Cochin missions were reported together. % school-age population in schools is calculated for Madras with school enrollment for government, aided, and non-aided inspected schools from the 1881-1882 Madras Administration report and the 5-14 population from the 1881 census. % school-age population in schools is calculated for Travancore with school enrollment (government and aided) in college, English schools, and vernacular schools from the 1881-1882 Travancore Administration report and the 5-14 population from the 1881 census. A comparable statistic is unavailable for Cochin.

Figure 3: Total students in missionary schools run by the LMS and the CMS, 1856 – 1880



Sources: Annual reports of the CMS and the LMS from 1856-1880.

5.1 Evidence of missionary-induced institutional change

Missionary political activities focused on advancing their proselytizing efforts. However, the extent of their ability to shape the political economy of a colonial polity varied depending on political opportunity structures they faced.

Missionaries were kept at arm's length by both the British East India Company (EIC) and the British Raj (Oddie 2013). The EIC and colonial administrators prioritized peace among religious groups in the areas they directly governed (Frykenberg 2013). This sentiment was reinforced by those instances where overlapping interests among the missionaries and colonial administrators led to social unrest (Oddie 2013, 170). A lack of enthusiasm for the colonial project among missionaries in general also contributed to this arm's length relationship (Frykenberg 2013).

Nevertheless, given missionary lobbying in the metropole (Carson 2012), neither the EIC nor British administrators could deny missionaries the right to operate within British India. Missionaries were allowed to proselytize across the subcontinent starting with the EIC's 1813 Charter Renewal (Frykenberg 2013). As evident from **Figure 3**, missionaries were actively involved within British India, with the district of Tinnevelly in the Madras Presidency hosting the highest concentrations of missionary educational efforts in the subcontinent (Church Missionary Society 1850-1920).

Missionaries occupied a different position within the political economy of native states. All native rulers in the subcontinent were required to recognize the supremacy of the British as paramount power. However, there existed substantial variation in the degree of autonomy afforded to native rulers. As explored in other work, British colonial policy varied temporally in the degree of local control and relations with princely states, often for idiosyncratic reasons (Banerjee and Iyer 2005; Iyer 2010). Greater autonomy was conditional on satisfactory performance. The colonial administration frequently employed threats of administrative takeover against native states (Desai 2005). Meanwhile, the historical development of individual states also produced variation in their

social structure, with some developing more hierarchical class structures. Differing levels of agency in conjunction with the social structure of society shaped the political opportunity structure faced by missionaries in a given princely state. In states with high levels of autonomy and steep social divides, missionaries were able to use their access with the colonial administration to their benefit.

An examination of efforts to abolish slavery in Travancore illustrate how missionaries as political actors induced institutional change in Travancore and Cochin. Enslaved individuals were at the bottom of the caste hierarchy, socioeconomically disadvantaged, and thus most open to missionary efforts (Aiya 1906a). They formed a large potential pool of converts for missionaries who in turn sought to incentivize conversion by advocating for the group's needs. Missionaries "agitated for the abolition of slavery" and submitted memorials to the Travancore and Madras governments (Aiya 1906, 481; Eapen 1985, 230-1). Their communications detailed significant lapses in the administration of the state: "the missionaries dwelled extensively upon the existing abuses, like the corruption in the administration, the extreme caste distinctions, the continuance of slavery, the malpractices around the monopolies of pepper and tobacco, and the disastrous neglect of economic opportunities" (Kooiman 1989). Missionaries recognized their active involvement in these developments, with one missionary noting that "it will not take long [...] before we will be nicknamed political missionaries, as 'we give no rest either to the Rajah or the Resident' on all these matters" (147). These efforts prompted the EIC to warn "the Raja that prompt and effective measures for improvement were needed to save Travancore from being placed under the direct management of the East India Company" (147).

Similar efforts by missionaries spurred institutional reforms like the grant-in-aid program and the opening of schools to members of "backward" castes (Desai 2005; Kooiman 1989). Early institutional reforms also produced further effects. For example, the abolition of slavery combined with access to schooling for members of "backward" castes fa-

cilitated the early twentieth century social movements that campaigned for the expansion of schooling in Travancore (Desai 2005). Thus, missionaries as political actors attempting to maximize their ability to attract congregants, induced institutional reforms with wide-reaching consequences.

Native states were unable to expel missionaries or ban new ones from entering. However, these states responded dynamically to missionary pressure. On the one hand, they pursued institutional change to placate missionaries and allay concerns from the British about mismanagement. On the other hand, native states did not passively react to missionary demands but proactively changed policy to gain greater control over the local conditions that fostered missionary lobbying. For example, as noted, Travancore's grant-in-aid system to support schools emerged out of missionary lobbying to support missionary schools. However, Travancore also gave large grants to non-missionary schools. Over time, the state made revisions to the grant-in-aid program, making such grants conditional on educational institutions adopting a standardized curriculum and being subject to inspection by the government's education department (Pillai 1940, 708). The state also expanded the government's educational footprint by making primary education free for substantial segments of their populations (716). We now turn to an investigation of the consequences of these institutional changes in south India.

5.2 Consequences of institutional change

In this section we examine how literacy rates changed across South Indian polities from 1891 to 1931 using taluk-level data from censuses. **Table 3** reports results from estimating Equation 1 across the three main samples that become increasingly stringent, from all taluks down to only border districts and then border taluks.[3]

Several results are worth highlighting. First, this period saw growing literacy across

3. All results reported in the paper at present rely on named based matching of spatial units over time. In the next iteration we will use spatially reweighted 1891 units for our analyses. We drop British Cochin, a military installation, from all analyses.

all of South India. For instance, overall literacy in the border taluks of the Madras Presidency grew by over 4 percentage points between 1891 and 1931 (column 3). Second, beyond general literacy gains across the entire region, taluks in Travancore and Cochin outperformed taluks in the Madras Presidency starting in 1911. Border taluks in Travancore saw *additional* literacy gains of 5.7 percentage points from 1891 to 1931 above those of Madras, while the comparable number for Cochin is 9.4 percentage points. Third, taluks in the Madras Presidency, nevertheless, were not laggards, reporting performance superior to that of the princely state of Mysore, as seen in column 1. The underperformance of Mysore relative to the Madras Presidency suggests that being a princely state by itself did not guarantee literacy gains during this period.

6 Mechanisms

6.1 Who is educating?

Extant work offers several explanations for why Travancore and Cochin saw differentially greater improvements in literacy over the late nineteenth and early twentieth centuries.[4] Some lay responsibility at the institutional reforms undertaken by the rulers of these native states (Aiya 1906a). While these reforms had a noticeable impact on literacy in these polities, an examination of who provided educational services (more on this below) reveals a nuanced picture. Meanwhile, others argue that Travancore and Cochin's relative gains resulted from the collective direct and indirect effects of missionary activities (Lankina and Getachew 2012). While both direct missionary efforts and the externalities of such actions shaped literacy in these polities, an examination of who provided educational services allows us to evaluate the relative magnitude of these pathways.

We collected data from state administration reports for Cochin and Travancore to document changes in who educated students in these polities over the period under study. Data for Cochin (**Figure** 4) allow us to isolate the share of schooling directly provided

4. The various time series reported in this section are still being compiled.

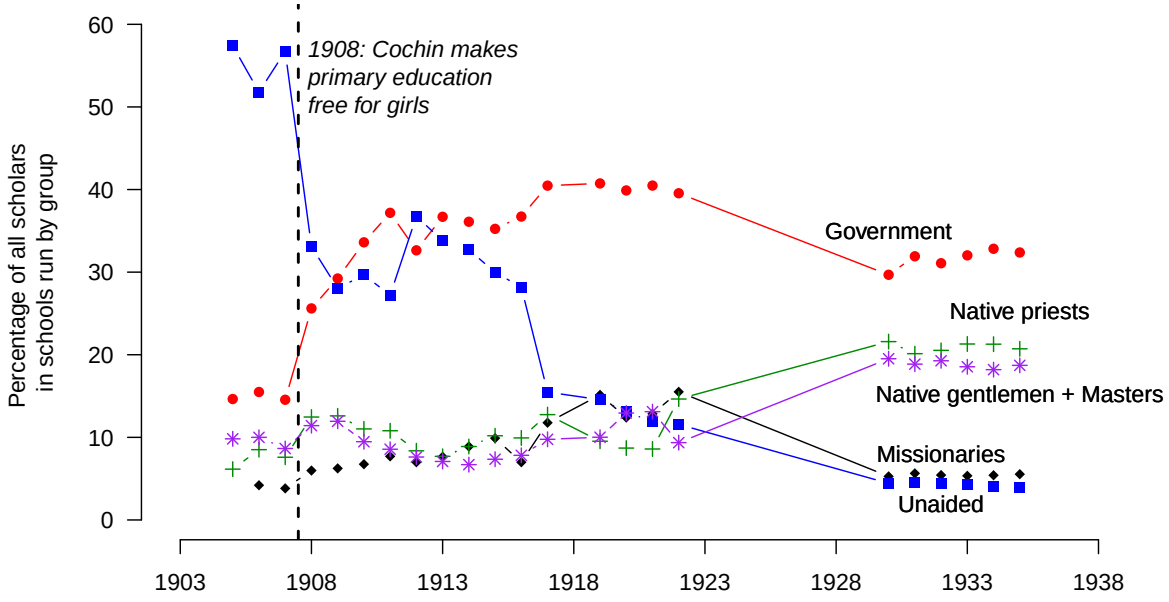
Table 3: Changes in literacy across census years among major polities of colonial South India

	All	Border districts	Border taluks
Year=1901	0.122	-0.0164	0.322
	(0.0979)	(0.422)	(0.199)
Year=1911	1.137***	1.650***	1.651***
	(0.148)	(0.604)	(0.249)
Year=1921	2.233***	2.694***	2.991***
	(0.174)	(0.652)	(0.285)
Year=1931	2.634***	4.175***	4.068***
	(0.192)	(0.619)	(0.278)
Cochin × Year=1901	0.0354	0.174	-0.165
	(0.588)	(0.723)	(0.636)
Cochin × Year=1921	2.903***	2.443*	2.145*
	(1.076)	(1.257)	(1.141)
Cochin × Year=1931	10.79***	9.246***	9.353***
	(1.606)	(1.729)	(1.683)
Travancore × Year=1901	1.408***	1.547**	0.759
	(0.539)	(0.683)	(0.798)
Travancore × Year=1911	3.114***	2.601***	1.816**
	(0.537)	(0.799)	(0.797)
Travancore × Year=1921	9.776***	9.316***	6.918***
	(0.824)	(1.044)	(0.926)
Travancore × Year=1931	9.274***	7.732***	5.747***
	(0.831)	(1.026)	(1.028)
Mysore × Year=1911	-0.947***		
	(0.203)		
Mysore × Year=1921	-1.087***		
	(0.165)		
Coorg × Year=1901	1.108***		
	(0.0979)		
Coorg × Year=1911	2.273***		
	(0.148)		
Coorg × Year=1921	3.808***		
	(0.174)		
Coorg × Year=1931	6.320***		
	(0.192)		
Constant	6.010***	9.196***	9.418***
	(0.120)	(0.307)	(0.280)
Taluk FEs	Y	Y	Y
Observations	1655	407	171

Note: Estimation method is OLS, with robust (Huber-White) standard errors in parentheses. Unit of analysis is taluk. Column 1 sample: all taluks in the Madras Presidency, Travancore, Cochin, Mysore, and Coorg. Column 2 sample: all taluks in Travancore and Cochin, and all taluks+ from districts that border these polities. Column 3 sample: only taluks along the borders between Cochin, Travancore, and Madras Presidency. *, **, and *** indicate statistical significance at 10%, 5%, and 1% level.

by missionary groups. In Cochin, the missionary share of the student population ranged between 5% and 15% between 1905 and 1930. State expansion of educational spending during this period is evident in the transformation of relative student shares among the remaining groups. The government doubled its share (15% to 30%), becoming the largest provider of education in the state, while shares of native priests and native gentlemen also see sizable growth. The collapse of student shares under unaided schools from 60% to < 5% also speaks to the significant increase in government outlays on education.

Figure 4: Percentage of students by type of school in Cochin, 1905 - 1930

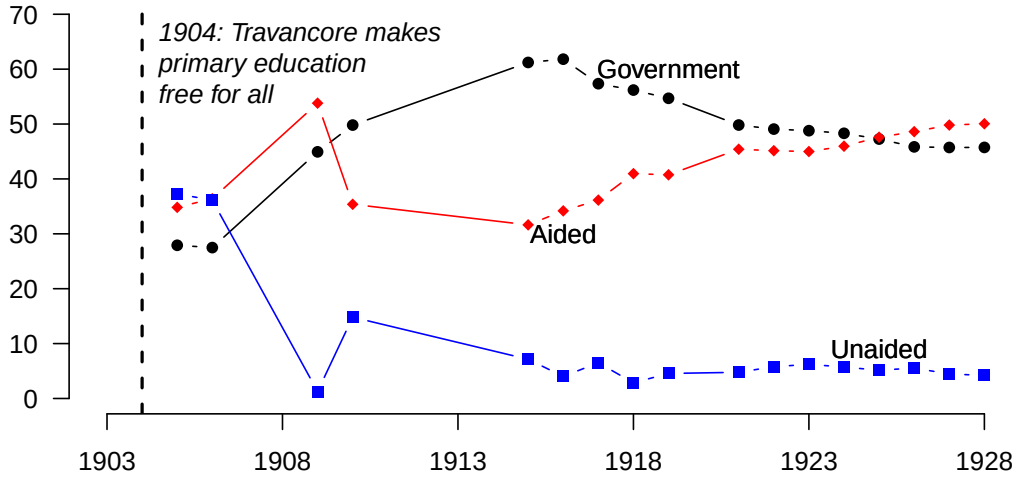


Sources: Cochin Annual Administrative Reports

Data for Travancore (**Figure 5**) do not systematically differentiate between missionary and native schools. Nevertheless, it reveals significant changes to the education provision landscape from 1905 to 1930. While government, aided, and unaided schools educated relatively equal shares of students in 1905, the first two captured almost all students by 1930, consistent with the significantly increased outlays on education by the state.

To further probe the role of missionaries in the direct provision of education in Travancore, we collected data from CMS and LMS annual reports ranging from 1880 to 1920 (**Figure 6**). Missionary student enrollment increased steadily throughout this pe-

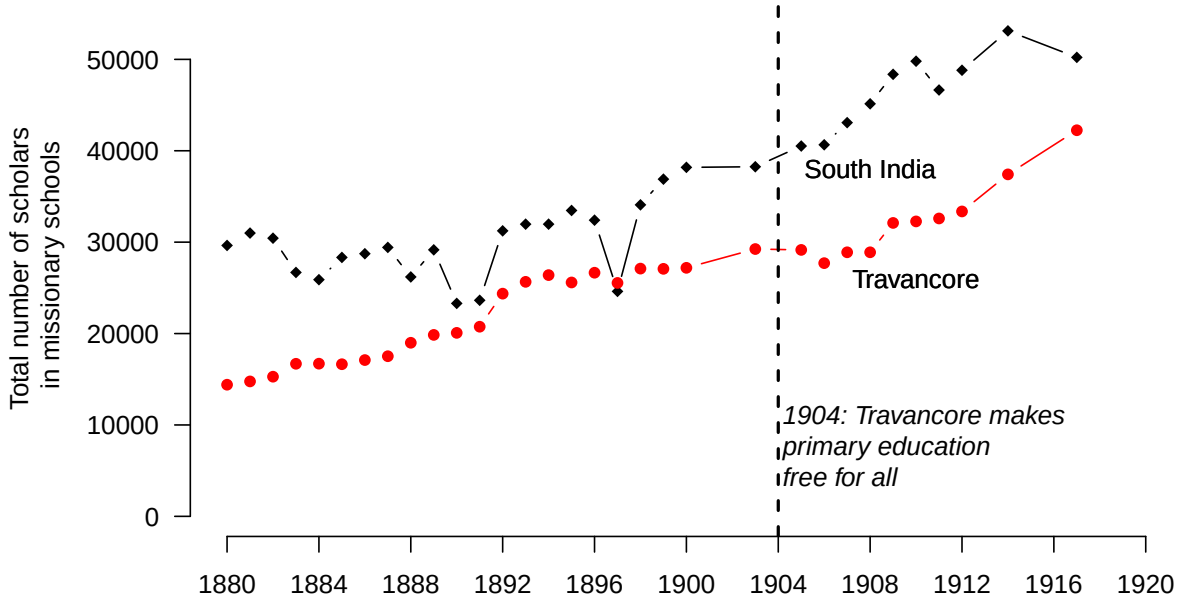
Figure 5: Percentage of students by type of school in Travancore, 1905 - 1930



Sources: Travancore Annual Administrative & Statistical Reports

riod. However, enrollment through other educational institutions increased at even faster rates. For instance, by the time Travancore made primary education free for all in 1904, missionary schools only enrolled approximately 15% of all students (authors' calculations).

Figure 6: Total students in missionary schools run by the LMS and the CMS, 1880 - 1918



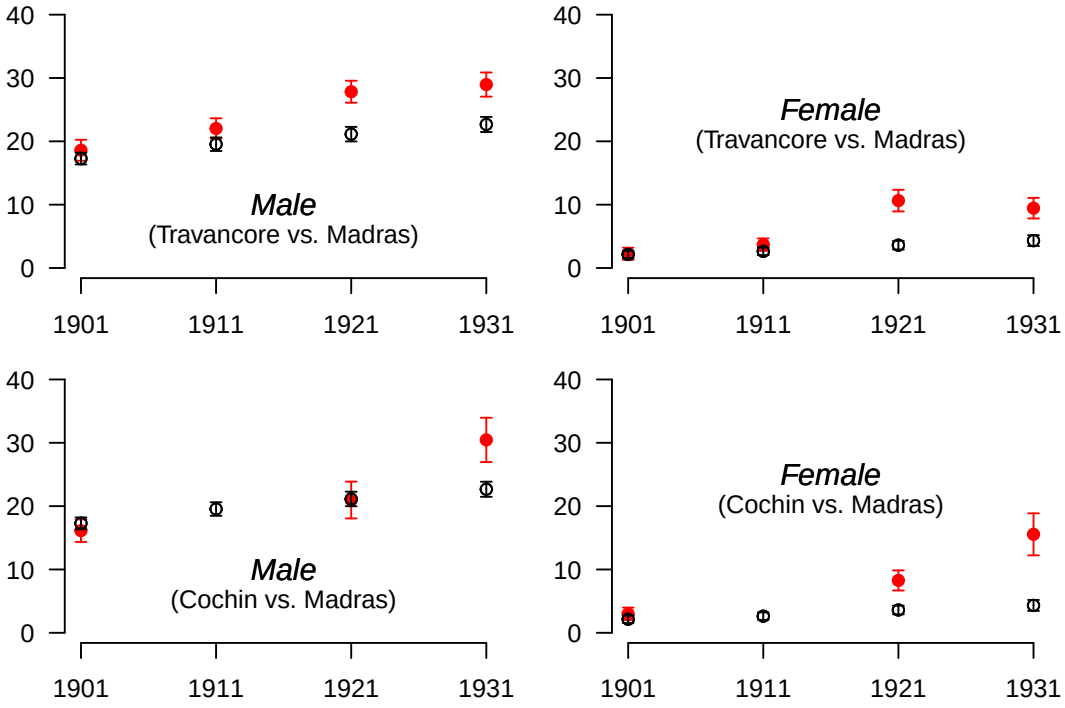
Sources: Annual reports of the CMS and LMS (1880-1918).

6.2 Who is getting educated?

Examining subgroup differences in literacy gains provides another approach to understanding differential educational gains in Travancore and Cochin. For instance, gains among only members of the Christian population would support the suggestion that missionary and church education spearheaded educational gains during this period. However, gains among the majority Hindu population and in particular among Hindu girls would suggest greater importance of state-led universal initiatives.

Literacy rates for both men and women grew in Travancore and Cochin compared to Madras (**Figure 7**, **Tables A1-A2**). Given the higher baseline for men in 1891 (**Table 1**), women experienced larger relative literacy gains. Compared to Madras, Travancore saw literacy gains for both genders by 1921 while only women pull ahead in Cochin by this time. This reflects differences in education policy between the two states. While Travancore made primary education free for both genders, Cochin only did so for females.

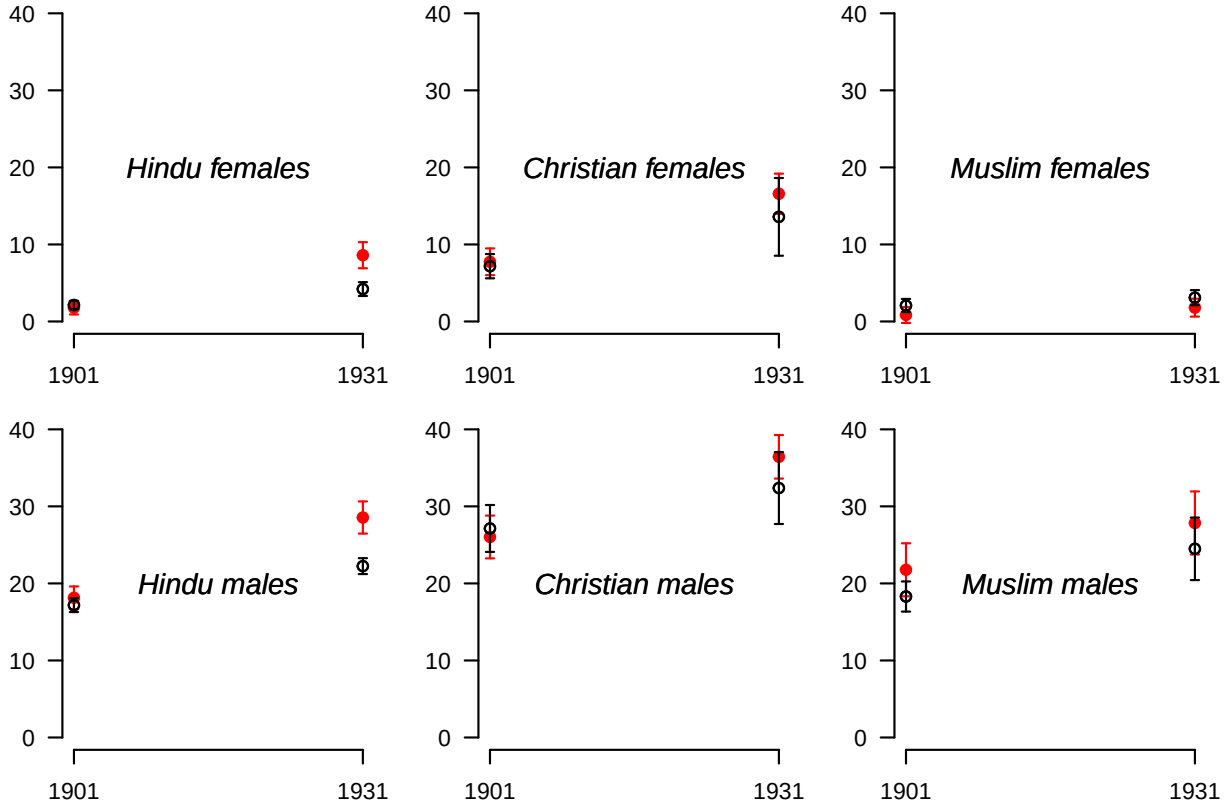
Figure 7: Literacy by gender, 1891-1931



Notes: Estimates from OLS regression on a sample of border taluks. Travancore and Cochin in red and Madras Presidency in black. 95% confidence intervals. See Tables A1 and A2 for regression output.

Across the three main religious groups (Hindus, Christians, and Muslims), differential literacy gains are largely limited to the majority Hindu population (**Figures 8** and A1). Hindu men and women in both Travancore and Cochin saw differential literacy gains compared to Hindu men and women in the Madras Presidency. Missionary and native Christian educational efforts are reflected in the higher literacy level among Christians in all three polities. However, Christians in the border taluks of Travancore are not differentially more literate than Christians in the border taluks of Madras (**Figure 8**).

Figure 8: Literacy rates by religion × gender (Madras vs. Travancore), 1891–1931



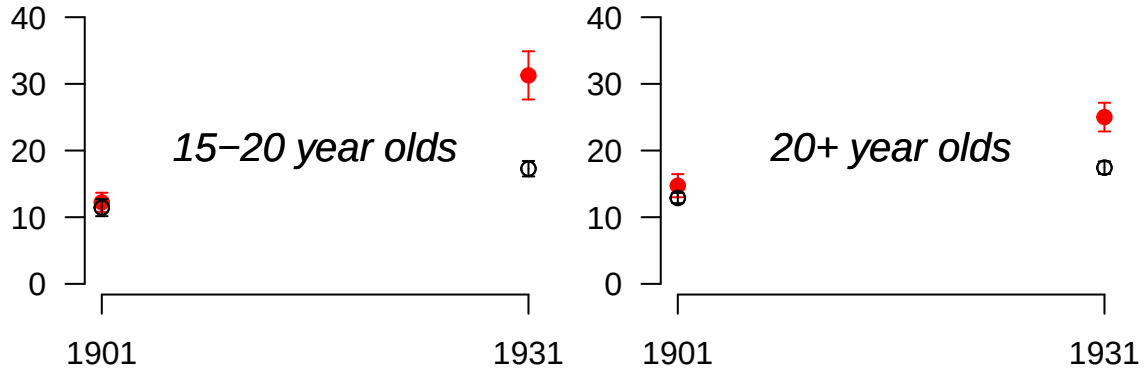
Notes: Estimates from OLS regression (border taluks sample). Travancore in red. Madras Presidency in black. Cochin estimates (Figure A1). 95% confidence intervals. See **Tables A3** and **A4** for regression output.

Christian women in Cochin (but not men) have differentially greater literacy by 1931 (Figure A1), likely resulting from the state's decision to make primary education free for women starting in 1908. The lack of educational uptake among the Muslim population, especially Muslim women, is a topic of regular discussion in the administrative reports

of this period (ex: Census of India (1931, 286)).

The gradual penetration of education into the broader population can also be ascertained by comparing literacy gains among different age cohorts. If greater literacy is the product of long-standing differences between populations, we should not see differences in the literacy rates between older and younger cohorts within a polity. However, if literacy gains are recently achieved through institutional reform then we should see higher literacy among younger cohorts. **Figure 9** reveals the latter pattern.

Figure 9: Change in literacy rates by age group (Madras vs. Travancore), 1891–1931



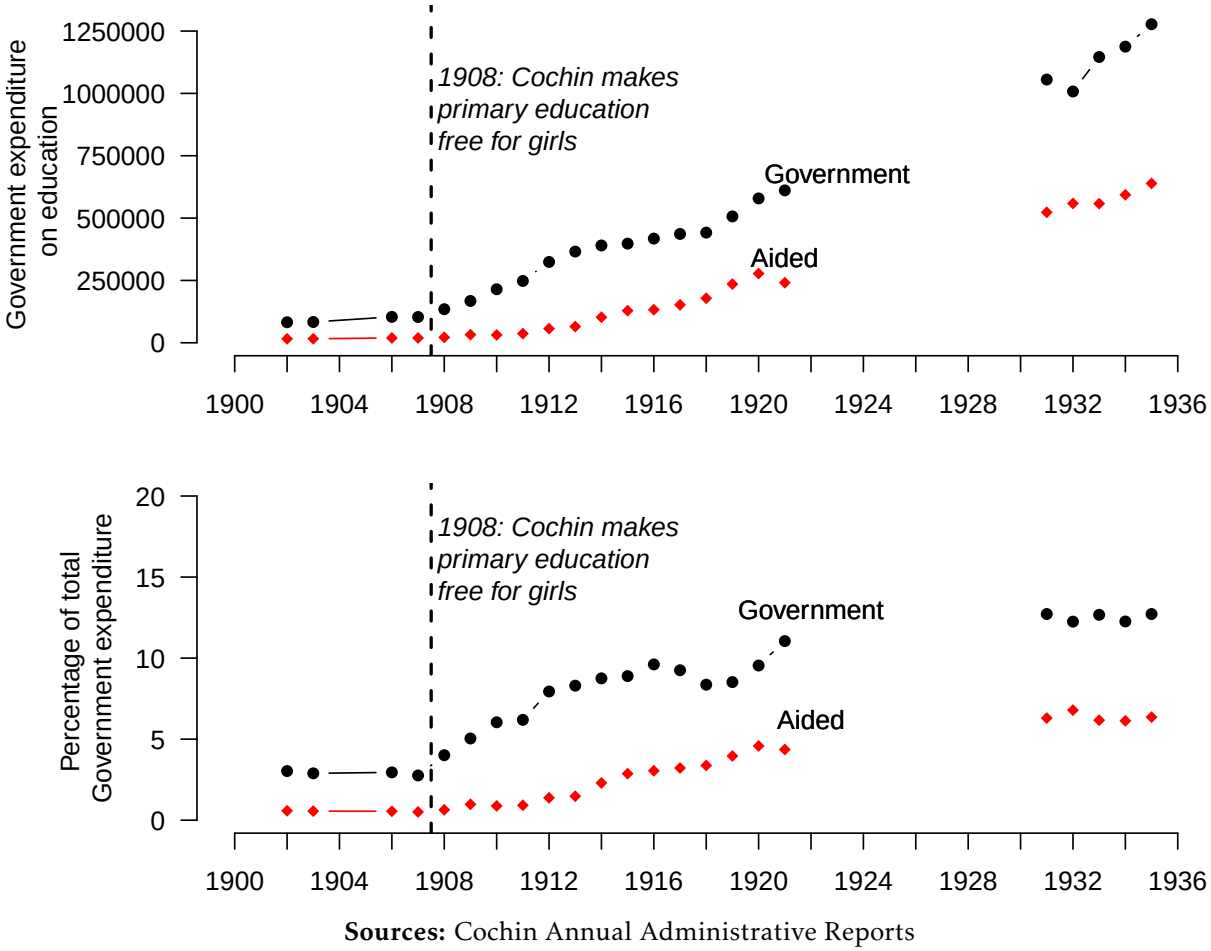
Notes: Estimates from OLS regression on a sample of border taluks. Travancore in red and Madras Presidency in black. 95% confidence intervals. See **Tables A5** and **A6** for regression output. Literacy by age-cohort data is not available for Cochin. The Madras Presidency data for 1891 provides literacy data for the following age brackets: 15-24 and 25-plus. Given that older adults were less likely to have received education in 1891, the above difference between cohorts is an underestimate.

6.3 Who is financing the education?

Both Travancore and Cochin made primary education free for a substantial share of their subjects in the first decade of the twentieth century. This increased access, in conjunction with grant-in-aid policies adopted by both states, required greater state spending on education. Grant-in-aid spending included support for missionary and native schools outside direct government management. Consequently, both the missionary and native non-governmental share of students attending grant-in-aid schools incorporates the indirect effect of state institutional reform.

Education spending grew markedly in the early decades of the twentieth century across Cochin, Travancore, and the Madras Presidency. Cochin went from spending ≈3% of all expenditure on education in 1906 to over 15% by 1915 (**Figure 10**). While spending on both government and aided schools increased, government schools saw greater investments, mirroring their rapidly growing share of the total student population (**Figure 4**).

Figure 10: Cochin government expenditure on schools by type, 1903 - 1922

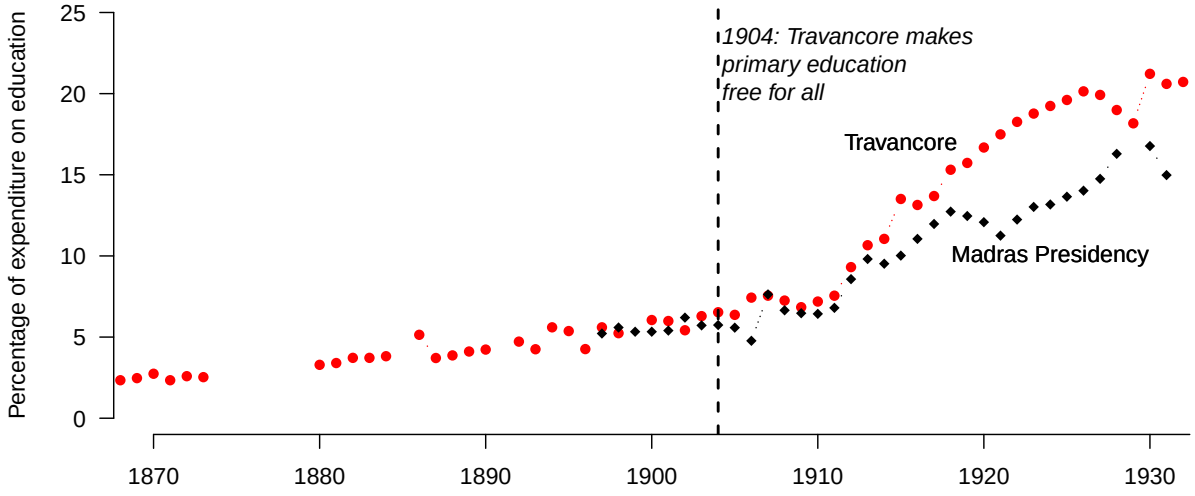


Sources: Cochin Annual Administrative Reports

Spending on education also increased in Travancore and the Madras Presidency (**Figure 11**). By the 1920s, Travancore was consistently spending greater than 15% of all expenditures on education. Though trialing Travancore, the Madras Presidency also spent a growing share of its expenditures on education. While both polities spent comparable sums per enrolled student (**Figure 12**, top panel), Travancore spent more

on education per capita (**Figure 12**, bottom panel). Thus, increased state spending facilitated the educational transformation of Travancore and Cochin in the early decades of the twentieth century.

Figure 11: Government expenditure on education (Madras vs. Travancore), 1870 - 1930



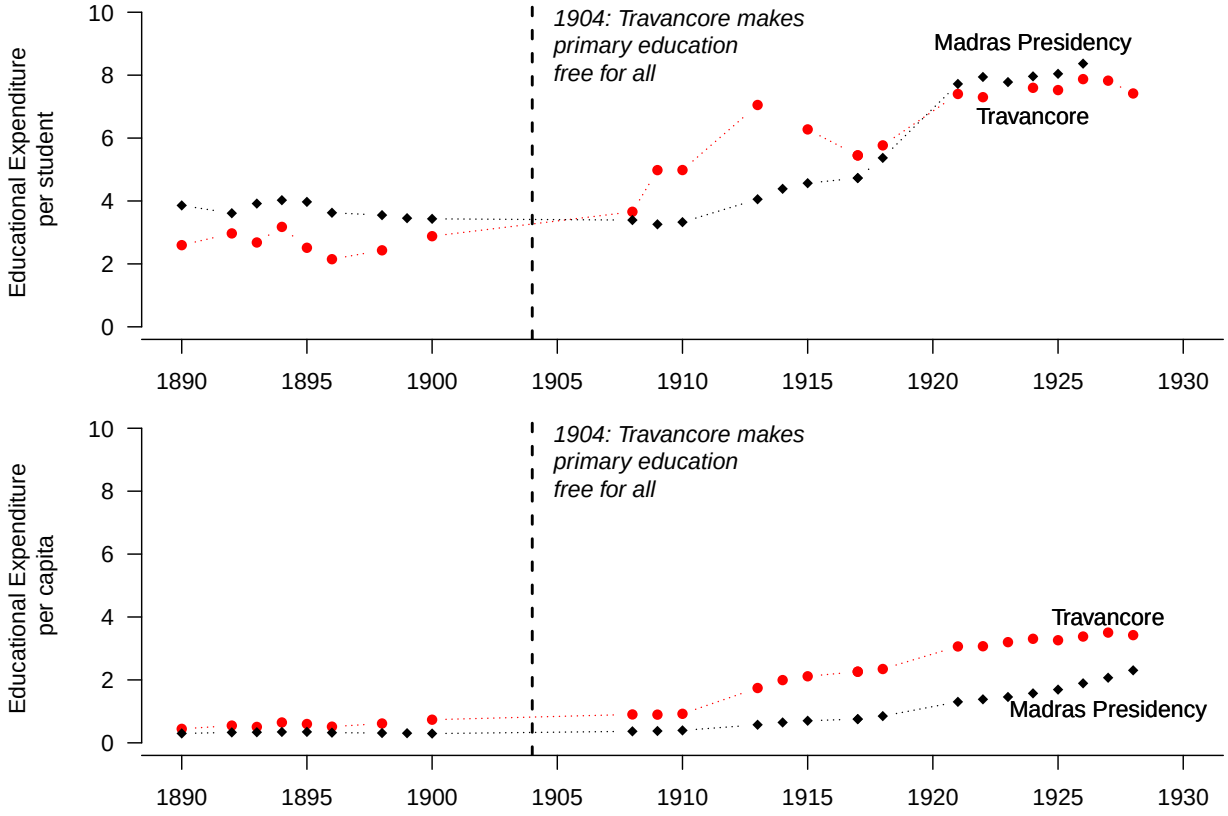
Sources: Madras Presidency and Travancore Annual Administrative Reports
Notes: Madras Presidency statistics represent education spending as share of Provincial expenditures.

6.4 What level of education?

Though all three polities expanded their education spending at the start of the twentieth century, they differed in where they focused these resources. By the 1910s, over 50% of Travancore's education spending was focused at the primary level (**Figure 13, top panel**). Both native states spent a larger share of their rapidly expanding education budgets (**Figures 10** and **11**) on primary schooling compared to the Madras presidency throughout the 1910s and 1920s.

Travancore and Cochin also dedicated a greater share of their education expenditure on secondary education relative to the Madras Presidency (**Figure 13, middle panel**). The timing of the drop in share of expenditure dedicated to secondary schooling in these polities coincides with the institutional reforms undertaken by these governments to make primary education free for substantial portions of their polities.

Figure 12: Government expenditure on education (Madras vs. Travancore), 1890 - 1930

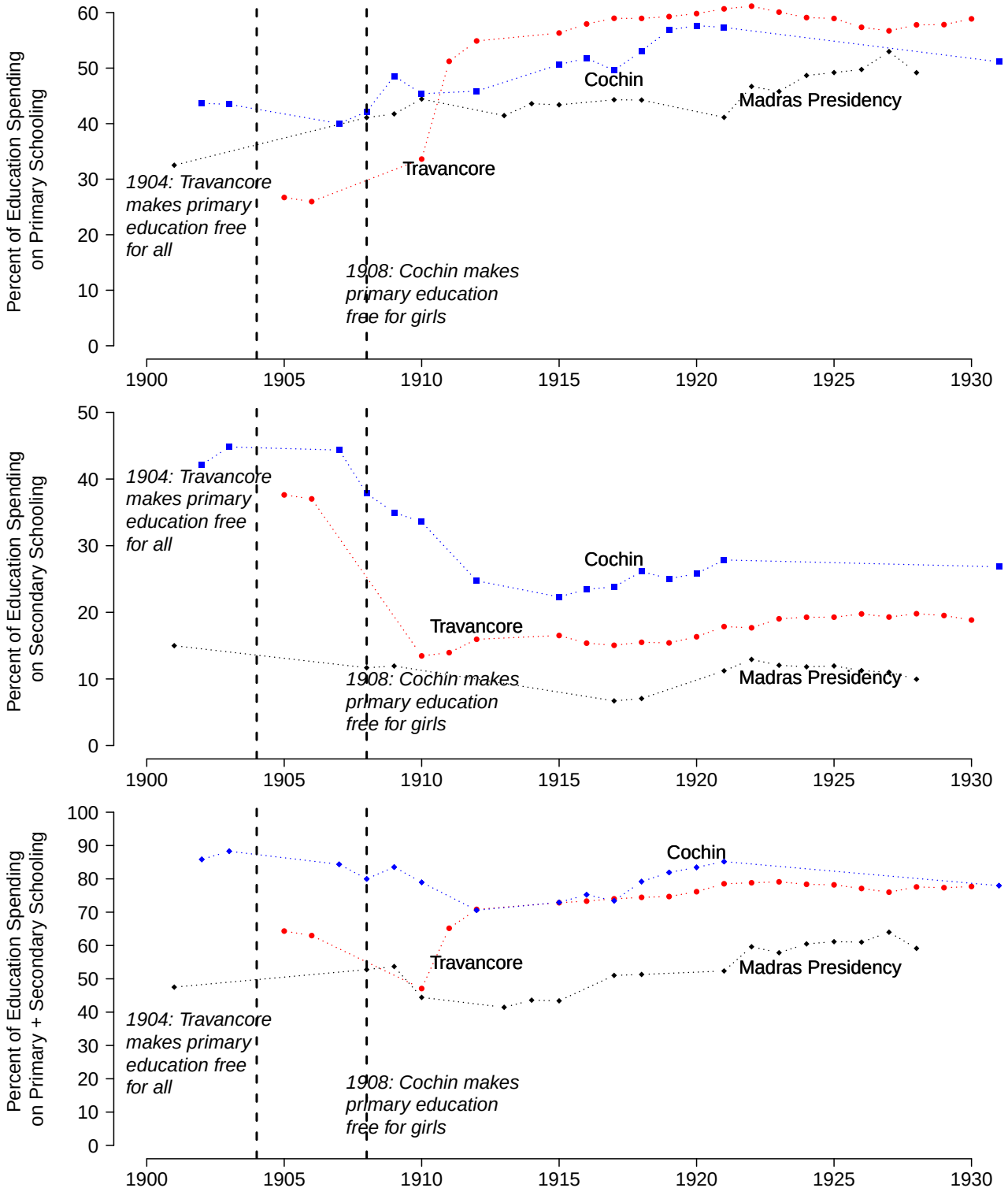


Sources: Madras Presidency and Travancore Annual Administrative Reports

Both native states allocated 70% or more of their total education spending toward primary and secondary schooling combined. Starting in 1910, Madras spent ≈54% on these categories, while Travancore and Cochin spent ≈74% and ≈78%, respectively (**Figure 13, bottom panel**).

The data reveal a transformation of educational financing in both Cochin and Travancore. Both states substantially increased spending on education, investing more per capita than the Madras Presidency (Section 6.3). Moreover, this increased spending was targeted, with roughly half of all education spending being targeted at the primary school level. While education needs were met in part through private entities, they actively reduced dependence on outsourcing over time by expanding their own educational capacity (Figures 4, 5, and 10). Taken together, the spending priorities of Travancore reveal an emphasis on providing education access to all members of their societies.

Figure 13: Government expenditure on primary and secondary education, 1900 – 1930



Sources: Madras Presidency, Travancore, and Cochin Annual Administrative Reports

7 Discussion

In this section, we juxtapose the the secondary literature and above analyses to adjudicate among explanations for the advances in literacy experienced by Travancore and Cochin in the first half of the twentieth century. We begin by examining the role of missionaries in this educational transformation. Missionary educational efforts across the polities that came to compose South India were well underway by the mid-nineteenth century. Their enrollment numbers reveal that missionary groups had comparable educational operations in the native states and in Madras Presidency taluks across the border during this period (**Table** 2, **Figure** 3). Consequently, the timing of when Travancore and Cochin overtook the Madras Presidency (the late-nineteenth century) and when the magnitude of their gains intensified (the early twentieth century) cannot be attributed to direct missionary education of the population. While literacy rates among the primary adopter of their educational efforts – Christians – were higher than the rest of the population across all polities, the difference is not statistically distinguishable across polities. The share of students being educated at missionary institutions also declined during this period (**Figures** 4 and 5). Taken together, these findings indicate that the differential literacy gains of Travancore and Cochin cannot be explained by the direct educational efforts of missionaries.

Existing research argues that competition for adherents created by the proselytizing efforts of missionaries contributed to literacy gains (Lankina and Getachew 2013). However, an emphasis on inter-religious competition neglects two points of nuance. First, while religious competition proved an important driver of institutional reform in Travancore, limited success of missionary proselytizing in Cochin meant that the state did not initiate educational reforms as a response to this threat (Koji 1994). Second, while inter-religious competition shaped institutional reforms, educating initiatives also show important intra-religious differences. Specifically, native Christians, supported by grant-in-aid, became a more important provider of education in Cochin than missionaries (**Figure** 4).

While native educators (Christian and non-Christian) played a prominent role in educating the population, it is important to contextualize the timing and magnitude of their efforts. By the 1920s, when the differential gains in literacy become sizable (**Table 3**), unaided educational institutions educated less than 10% of all students in both Cochin and Travancore (**Figures 4** and **5**). Government schools, at ≈ 30%, were the largest provider of education in the state. Though native educators collectively provided education to ≈ 40% of all students, the state subsidized these institutions through grant-in-aid and free primary education initiatives.

The evidence presented above also contradicts a simple demand-side explanation. Specifically, some have argued that the differential literacy gains observed in Travancore can be attributed to bottom-up demand for education resulting from mid-nineteenth century land reforms, which increased commercialization of agriculture and allowed for greater returns to education (Tharakan 1984). However, only after the state solved both the supply-side constraint (providing for more schools starting in the 1870s) and reduced barriers to access and entry (allowing members of lower-castes to attend schools and making primary education free for all starting in the 1890s and 1900s) did the differential educational gains experienced by Travancore materialize (**Table 3**). Differential gains among populations of different religions (**Figure 8**) and gains among women (**Figure 7**) also counter the suggestion that educational gains in Travancore were primarily the product of demand-side changes.

Historical differences among the taluks that compose Travancore and Cochin or future Kerala (composed of most taluks from Travancore, all of Cochin, and some taluks from the Madras Presidency) also do not explain the differential gains in literacy. Unit fixed effects account for all time-invariant characteristics, including explanations that link literacy gains to a common language or rule under ancient kingdoms (Jeffrey 1987). We also find that areas belonging to he Madras Presidency that became part of future Kerala lagged behind Cochin and Travancore on literacy through 1931. Furthermore, these areas

also lagged behind those taluks in Travancore that did not become part of Kerala (**Table A7**). This mitigates concerns that the educational gains experienced by Travancore and Cochin have their roots in a shared culture or some latent common trait shared by the populations of taluks that came to constitute Kerala after India became independent.

Finally, evidence for the under performance of Mysore during this period (**Table 3**) weaken blanket arguments that explain native state gains by pointing to superior policy by heads of princely states relative to the colonial power. While state-led institutional reforms transformed the educational landscape of Travancore and Cochin, these reforms were not pursued in a vacuum (Desai 2005). Differences in the degree of agency possessed by native states mattered greatly. In exchange for greater policy agency, states like Travancore and Cochin had to endure performance evaluations by the paramount power. Given the ability of missionaries to lobby the paramount power, the former had more room to pressure native states with greater agency. Meanwhile, native polities with nominal heads who had limited policy freedom (like Mysore) did not face such pressure.

8 Conclusion

We provide the most fine-grained analysis of educational outcomes in colonial India to date. Data collated from censuses, state administration reports, missionary annual reports, and statistical abstracts show that the princely states of Travancore and Cochin experienced greater literacy gains compared to the Madras Presidency by the early twentieth century. Data on supply, demand, and financing of these educational efforts bolster the argument that these differential gains resulted from a series of institutional reforms undertaken by these states starting in the closing decades of the nineteenth century.

Our findings underscore an important but understudied dimension of missionary activity. Beyond proselytizing and directly providing public goods, missionaries were important political actors within the colonies. Their activities, especially when backed by

the coercive capacity of the colonial state, threatened the status quo of indigenous polities. Missionary efforts to proselytize often involved the provision of education. This allowed for the accumulation of human capital and a pathway for upward social mobility for socioeconomically backward groups, which in turn introduced novel dynamics into these societies. State responses to limit the influence of missionaries also shaped these societies in fundamental ways. Evidence from South India reveals that the externalities of missionary activity in Travancore and Cochin – substantial educational reforms undertaken during the late nineteenth and early twentieth centuries – precipitated the significant educational advantage enjoyed by these areas for decades thereafter. Future research should explore the socioeconomic impact of missionaries as political actors in other colonial settings.

These findings also speak to two debates in Indian economic history. First, the evidence allows us to conclude that direct missionary education efforts did not drive the differential gains experienced by Travancore and Cochin. Polity-level institutional reforms, pursued under a confluence of internal and external political pressures, drove such gains. Second, parts of present-day Kerala that belonged to the Madras Presidency lagged behind regions belonging to Travancore and Cochin (**Table A7**). The over time shrinking of this gap between south-central and northern Kerala (Ramachandran 1997) points to returns from post-independence educational policy pursued by the state.

The findings also speak to the externalities of indirect colonial rule. Britain as the paramount power on the subcontinent provided national security as a public good for all polities that recognized their power. Princely states, freed somewhat from needing to spend directly on national security—although they still had to pay the British in taxes—could have redirected their resources toward other ends. Princely states within India somewhat resembled the settler dominions within the empire; like the dominions, some princely states could direct more funding toward the pursuit of human capital development rather than defense (Davis and Huttenback 1986). The degree of agency afforded

to individual princely states—and the constraints imposed by missionary and colonial demands—depended on the initial conditions of their relations with the British in the consolidation of British power in India.

More generally, we hope that future work will make use of taluk-level colonial data to tackle a class of questions that were previously quantitatively intractable. For example, a district-level analysis of Kerala is circumscribed by the paucity of observations. Neither Cochin or Travancore had districts in the colonial period, and northern Kerala was mostly a single district. Even after independence, a district-level analysis of Kerala would only provide 5 observations in 1956 and 14 observations today. In contrast, utilizing the taluk-level approach gives dozens of taluks in 1931 and allows a more in-depth analysis of Indian economic development

References

Aiya, V Nagam. 1906a. *The Travancore State Manual.* Vol. 1. Travancore Government Press.

———. 1906b. *The Travancore State Manual.* Vol. 2. Travancore Government Press.

Banerjee, Abhijit, and Lakshmi Iyer. 2005. "History, institutions, and economic performance: The legacy of colonial land tenure systems in India." *American Economic Review* 95 (4): 1190–1213.

Becker, Sascha O, and Ludger Woessmann. 2009. "Was Weber wrong? A human capital theory of Protestant economic history." *The Quarterly Journal of Economics* 124 (2): 531–596.

Calvi, Rossella, Lauren Hoehn-Velasco, and Federico G Mantovanelli. 2022. "The Protestant legacy: missions, gender, and human capital in India." *Journal of Human Resources* 57 (6): 1946–1980.

Calvi, Rossella, and Federico G Mantovanelli. 2018. "Long-term effects of access to health care: Medical missions in colonial India." *Journal of Development Economics* 135:285–303.

Carson, Penelope. 2012. *The East India Company and Religion, 1698-1858.* Vol. 7. Boydell Press.

———. 2013. "Christianity, Colonialism, and Hinduism in Kerala: Integration, Adaptation, or Confrontation?" In *Christians and missionaries in India*, 127–154. Routledge.

Census of India. 1931. *1931 Census of India - Volume XXVIII - Travancore.* Technical report.

Chaudhary, Latika. 2009. "Determinants of primary schooling in British India." *The Journal of Economic History* 69 (1): 269–302.

Chaudhary, Latika, and James Fenske. 2023. "Railways, development, and literacy in India." *The Journal of Economic History* 83 (4): 1139–1174.

Chaudhary, Latika, and Jared Rubin. 2016. "Religious identity and the provision of public goods: Evidence from the Indian Princely States." *Journal of Comparative Economics* 44 (3): 461–483.

Church Missionary Society. 1850-1920. *Proceedings of the Church Missionary Society.* Technical report.

Cole, Arthur H. 1961. "The relations of missionary activity to economic development." *Economic Development and Cultural Change* 9 (2): 120–127.

Da Costa, Emilia Viotti. 1994. *Crowns of glory, tears of blood.* Oxford University Press.

Davis, Lance E, and Robert A Huttenback. 1986. *Mammon and the pursuit of Empire: The political economy of British imperialism, 1860-1912.* Cambridge University Press.

Desai, Manali. 2005. "Indirect British rule, state formation, and welfarism in Kerala, India, 1860–1957." *Social Science History* 29 (3): 457–488.

Dulay, Dean. 2022. "The search for spices and souls: Catholic missions as colonial state in the Philippines." *Comparative Political Studies* 55 (12): 2050–2085.

Eapen, Kollettu Varghese. 1985. *Church missionary society and education in Kerala.* Kollett Publication.

Fischer-Tiné, Harald, and Michael Mann. 2004. *Colonialism as civilizing mission: Cultural ideology in British India.* Anthem Press.

Frykenberg, Robert Eric. 2013. "Christians in India: An historical overview of their complex origins." In *Christians and Missionaries in India*, 33–61. Routledge.

Gallego, Francisco A, and Robert Woodberry. 2010. "Christian missionaries and education in former African colonies: How competition mattered." *Journal of African Economies* 19 (3): 294–329.

Good, Charles M. 1991. "Pioneer medical missions in colonial Africa." *Social science & medicine* 32 (1): 1–10.

Grossman, Gene M, and Elhanan Helpman. 2001. *Special interest politics.* MIT press.

Iyer, Lakshmi. 2010. "Direct versus indirect colonial rule in India: Long-term consequences." *The Review of Economics and Statistics* 92 (4): 693–713.

Jeffrey, Robin. 1987. "Governments and culture: How women made Kerala literate." *Pacific Affairs*, 447–472.

Koji, Kawashima. 1994. "Missionaries, the Hindu State and British Paramountcy in Travancore and Cochin, 1858-1936." PhD diss., University of London – School of Oriental and African Studies (SOAS).

Kooiman, Dick. 1989. *Conversion & Social Equality in India.* South Asia Publications.

———. 2013. "Who is to benefit from missionary education? Travancore in the 1930s." In *Missionary Encounters*, 153–173. Routledge.

Lankina, Tomila, and Lullit Getachew. 2012. "Mission or empire, word or sword? The human capital legacy in postcolonial democratic development." *American Journal of Political Science* 56 (2): 465–483.

———. 2013. "Competitive religious entrepreneurs: Christian missionaries and female education in colonial and post-colonial India." *British Journal of Political Science* 43 (1): 103–131.

Mateer, Samuel. 1883. *Native life in Travancore.* WH Allen & Company.

Menon, P Shungoonny. 1878. *History of Travancore from the earliest times.* Forgotten Books.

Missionary Conference. 1879. *Missionary Conference: South India and Ceylon.* Addison & Co.

Nair, PR Gopinathan. 1976. "Education and socio-economic change in Kerala, 1793-1947." *Social Scientist*, 28–43.

Nunn, Nathan. 2010. "Religious conversion in colonial Africa." *American Economic Review* 100 (2): 147–152.

Oddie, Geoffrey A. 2013. "Constructing "Hinduism": The impact of the Protestant missionary movement on Hindu self-understanding." In *Christians and Missionaries in India*, 155–182. Routledge.

Paglayan, Agustina S. 2021. "The non-democratic roots of mass education: evidence from 200 years." *American Political Science Review* 115 (1): 179–198.

———. 2022. "Education or indoctrination? The violent origins of public school systems in an era of state-building." *American Political Science Review* 116 (4): 1242–1257.

Pillai, Sadasyatilaka TK. 1940. "The Travancore State Manual." *Travancore Government Press.*

Porter, Andrew. 1997. "'Cultural imperialism'and protestant missionary enterprise, 1780–1914." *The Journal of Imperial and Commonwealth History* 25 (3): 367–391.

Ramachandran, V.K. 1997. "On Kerala's Development Achievements." In *Indian development: Selected regional perspectives*, edited by Jean Drèze and Amartya Sen. Oxford University Press.

Rice, Benjamin Lewis. 1884. *Report on Education in Coorg from 1834-1882.* Superintendent of Government Printing, India.

Rice, C Duncan. 1982. "The missionary context of the British anti-slavery movement." In *Slavery and British Society 1776–1846*, 150–163. Springer.

Schendel, Jörg. 1999. "Christian Missionaries in Upper Burma, 1853–85." *South East Asia Research* 7 (1): 61–91.

Sen, Amartya. 1992. "Missing women." *BMJ: British Medical Journal* 304 (6827): 587.

Sengupta, Parna. 2011. *Pedagogy for religion: missionary education and the fashioning of Hindus and Muslims in Bengal.* University of California Press.

Smith, Jonathan D. 2017. "Positioning missionaries in development studies, policy, and practice." *World Development* 90:63–76.

Tharakan, PK Michael. 1984. "Socio-economic factors in educational development: Case of nineteenth century Travancore." *Economic and Political Weekly*, 1913–1928.

Valencia Caicedo, Felipe. 2019. "The mission: Human capital transmission, economic persistence, and culture in South America." *The Quarterly Journal of Economics* 134 (1): 507–556.

Waldinger, Maria. 2017. "The long-run effects of missionary orders in Mexico." *Journal of Development Economics* 127:355–378.

Washbrook, David. 1976. *The Emergence of Provincial Politics.* Cambridge University Press.

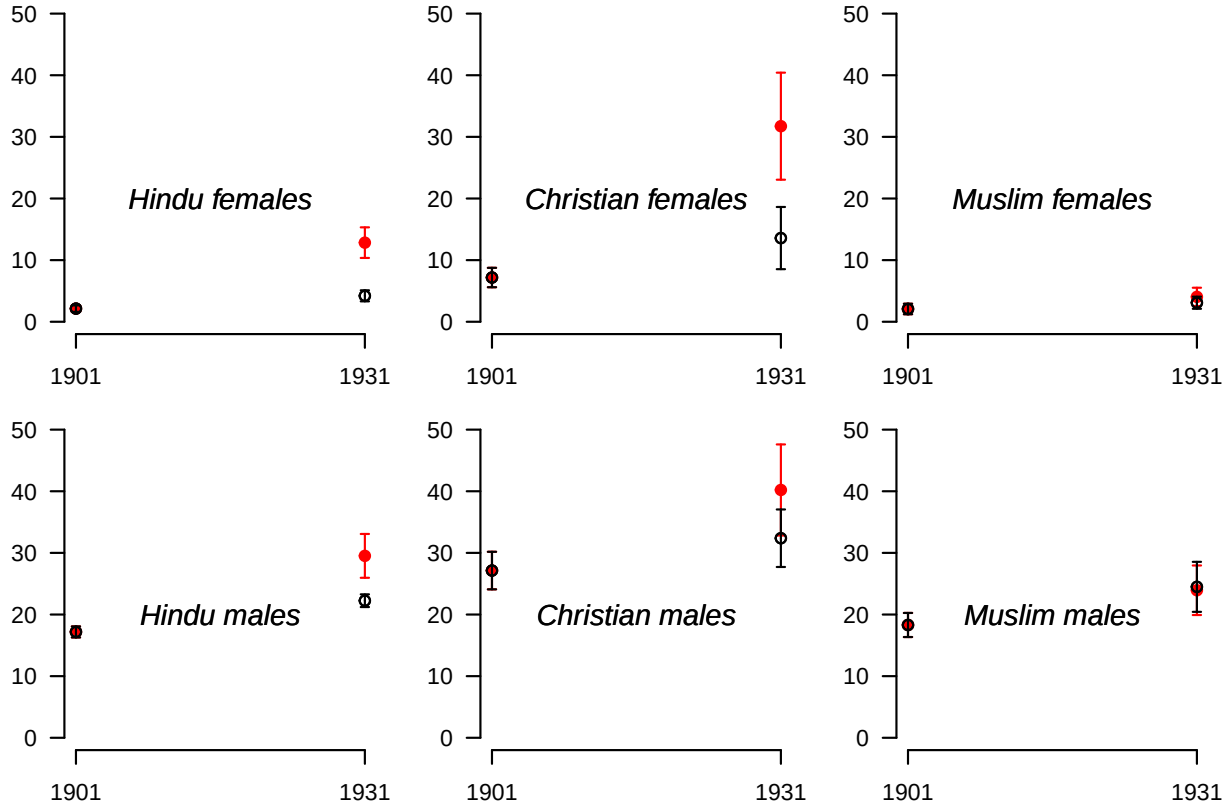
Wietzke, Frank-Borge. 2015. "Long-term consequences of colonial institutions and human capital investments: Sub-national evidence from Madagascar." *World Development* 66:293–307.

———. 2023. *Power and conviction: the political economy of missionary work in Colonial-Era Africa.* Cambridge University Press.

Woodberry, Robert D. 2004. "The shadow of empire: Christian missions, colonial policy, and democracy in postcolonial societies." PhD diss., The University of North Carolina at Chapel Hill.

Appendix

Figure A1: Change in literacy rates by religion × gender (Madras vs. Cochin), 1891–1931



Notes: Estimates from OLS regression on a sample of border taluks. Travancore in red and Madras Presidency in black. Cochin estimates (Figure 8). 95% confidence intervals. See **Table A3** and **Table A4** for regression output.

Table A1: Results for males

	All	Border districts	Border taluks
Year=1901	0.175	0.108	0.460
	(0.143)	(0.487)	(0.349)
Year=1911	1.949***	3.181***	2.723***
	(0.207)	(0.706)	(0.456)
Year=1921	3.379***	4.329***	4.315***
	(0.240)	(0.773)	(0.511)
Year=1931	3.901***	6.617***	5.846***
	(0.277)	(0.712)	(0.543)
Cochin × Year=1901	-0.868	-0.802	-1.154
	(0.849)	(0.977)	(0.938)
Cochin × Year=1921	0.765	-0.184	-0.170
	(1.459)	(1.650)	(1.583)
Cochin × Year=1931	9.736***	7.019***	7.791***
	(1.733)	(1.873)	(1.862)
Travancore × Year=1901	2.495***	2.562***	1.314
	(0.783)	(0.919)	(1.079)
Travancore × Year=1911	4.316***	3.083***	2.485**
	(0.771)	(1.032)	(1.120)
Travancore × Year=1921	9.870***	8.920***	6.700***
	(0.968)	(1.225)	(1.209)
Travancore × Year=1931	10.16***	7.446***	6.298***
	(0.910)	(1.130)	(1.276)
Mysore × Year=1911	-1.487***		
	(0.306)		
Mysore × Year=1921	-1.669***		
	(0.273)		
Coorg × Year=1901	1.465***		
	(0.143)		
Coorg × Year=1911	2.621***		
	(0.207)		
Coorg × Year=1921	4.434***		
	(0.240)		
Coorg × Year=1931	6.926***		
	(0.277)		
Constant	11.03***	16.51***	16.82***
	(0.164)	(0.362)	(0.371)
Taluk FEs	Y	Y	Y
Observations	1655	407	171

Note: Estimation method is OLS, with robust (Huber-White) standard errors in parentheses. Unit of analysis is taluk. Column 1 sample: all taluks in the Madras Presidency, Travancore, Cochin, Mysore, and Coorg. Column 2 sample: all taluks in Travancore and Cochin, and all taluks+ from districts that border these polities. Column 3 sample: only taluks along the borders between Cochin, Travancore, and Madras Presidency. *, **, and *** indicate statistical significance at 10%, 5%, and 1% level.

Table A2: Results for females

	All	Border districts	Border taluks
Year=1901	0.107	-0.123	0.188***
	(0.0788)	(0.399)	(0.0575)
Year=1911	0.402***	0.219	0.675***
	(0.117)	(0.557)	(0.128)
Year=1921	1.144***	1.086*	1.648***
	(0.134)	(0.589)	(0.237)
Year=1931	1.425***	1.863***	2.371***
	(0.143)	(0.606)	(0.368)
Cochin × Year=1901	0.940**	1.170**	0.860*
	(0.423)	(0.580)	(0.436)
Cochin × Year=1921	5.172***	5.230***	4.667***
	(0.790)	(0.985)	(0.845)
Cochin × Year=1931	12.17***	11.73***	11.22***
	(1.633)	(1.755)	(1.733)
Travancore × Year=1901	0.202	0.431	0.103
	(0.458)	(0.607)	(0.589)
Travancore × Year=1911	1.809***	1.991**	1.062
	(0.539)	(0.772)	(0.650)
Travancore × Year=1921	9.528***	9.586***	7.038***
	(1.107)	(1.259)	(1.067)
Travancore × Year=1931	8.363***	7.926***	5.123***
	(1.058)	(1.222)	(1.080)
Mysore × Year=1911	-0.247		
	(0.166)		
Mysore × Year=1921	-0.407***		
	(0.0983)		
Coorg × Year=1901	0.590***		
	(0.0788)		
Coorg × Year=1911	1.516***		
	(0.117)		
Coorg × Year=1921	2.942***		
	(0.134)		
Coorg × Year=1931	5.188***		
	(0.143)		
Constant	0.969***	1.986***	1.954***
	(0.102)	(0.321)	(0.280)
Taluk FEs	Y	Y	Y
Observations	1655	407	171

Note: Estimation method is OLS, with robust (Huber-White) standard errors in parentheses. Unit of analysis is taluk. Column 1 sample: all taluks in the Madras Presidency, Travancore, Cochin, Mysore, and Coorg. Column 2 sample: all taluks in Travancore and Cochin, and all taluks+ from districts that border these polities. Column 3 sample: only taluks along the borders between Cochin, Travancore, and Madras Presidency. *, **, and *** indicate statistical significance at 10%, 5%, and 1% level.

Table A3: Results by religion (males)

	Hindu	Muslim	Christian
Year=1901	0.450	1.294*	5.352***
	(0.375)	(0.750)	(1.555)
Year=1931	5.518***	7.483***	10.60***
	(0.473)	(2.148)	(2.533)
Cochin × Year=1931	7.272***	-0.551	7.830*
	(1.899)	(2.880)	(4.593)
Travancore × Year=1901	0.957	3.468	-1.105
	(0.961)	(2.425)	(2.265)
Travancore × Year=1931	6.311***	3.353	4.054
	(1.346)	(3.427)	(3.038)
Constant	16.73***	17.01***	21.78***
	(0.320)	(0.834)	(0.621)
Taluk FEs	Y	Y	Y
Sample	Border taluks	Border taluks	Border taluks
Observations	100	100	100

Note: Estimation method is OLS, with robust (Huber-White) standard errors in parentheses. Unit of analysis is taluk. Column 1 sample: all taluks in the Madras Presidency, Travancore, and Cochin. Column 2 sample: all taluks in Travancore and Cochin, and all taluks from districts that border these polities. Column 3 sample: only taluks along the borders between Cochin, Travancore, and Madras Presidency. *, **, and *** indicate statistical significance at 10%, 5%, and 1% level.

Table A4: Results by religion (females)

	Hindu	Muslim	Christian
Year=1901	0.186***	0.579	1.447**
	(0.0438)	(0.443)	(0.693)
Year=1931	2.260***	1.595***	7.849***
	(0.416)	(0.522)	(2.800)
Cochin × Year=1931	8.630***	0.951	18.15***
	(1.343)	(0.890)	(5.324)
Travancore × Year=1901	-0.334	-1.229	0.572
	(0.579)	(0.851)	(1.156)
Travancore × Year=1931	4.392***	-1.293	3.004
	(1.128)	(0.954)	(3.178)
Constant	1.948***	1.493***	5.730***
	(0.257)	(0.285)	(0.565)
Taluk FEs	Y	Y	Y
Sample	Border taluks	Border taluks	Border taluks
Observations	100	96	100

Note: Estimation method is OLS, with robust (Huber-White) standard errors in parentheses. Unit of analysis is taluk. Column 1 sample: all taluks in the Madras Presidency, Travancore, and Cochin. Column 2 sample: all taluks in Travancore and Cochin, and all taluks from districts that border these polities. Column 3 sample: only taluks along the borders between Cochin, Travancore, and Madras Presidency. *, **, and *** indicate statistical significance at 10%, 5%, and 1% level.

Table A5: Results for age 15-20 (everyone)

	All	Border districts	Border taluks
Year=1901	0.328**	-0.675	-0.726
	(0.142)	(0.544)	(0.526)
Year=1921	3.088***	2.991***	3.303***
	(0.259)	(0.935)	(0.642)
Year=1931	4.046***	5.854***	5.118***
	(0.270)	(0.854)	(0.433)
Travancore × Year=1901	0.817	1.820**	0.801
	(0.690)	(0.873)	(1.029)
Travancore × Year=1931	19.38***	17.57***	14.00***
	(1.670)	(1.872)	(2.232)
Constant	8.339***	12.58***	12.16***
	(0.155)	(0.442)	(0.475)
Taluk FEs	Y	Y	Y
Observations	1062	274	100

Note: Estimation method is OLS, with robust (Huber-White) standard errors in parentheses. Unit of analysis is taluk. Column 1 sample: all taluks in the Madras Presidency and Travancore. Column 2 sample: all taluks in Travancore and all taluks in the Madras Presidency from districts that border Travancore. Column 3 sample: only taluks along the border between Travancore and Madras Presidency. Literacy by age-cohort data is not available for Cochin. The Madras Presidency data for 1891 provides literacy data for the following age brackets: 15-24 and 25-plus. Given that older adults were less likely to have received education in 1891, the above difference between cohorts is an underestimate. *, **, and *** indicate statistical significance at 10%, 5%, and 1% level.

Table A6: Results for age 20+ (everyone)

	All	Border districts	Border taluks
Year=1901	-0.520***	-0.656	-0.362
	(0.121)	(0.494)	(0.272)
Year=1921	1.859***	2.399***	2.700***
	(0.219)	(0.841)	(0.353)
Year=1931	2.520***	4.257***	4.182***
	(0.239)	(0.798)	(0.437)
Travancore × Year=1901	2.548***	2.684***	1.844*
	(0.722)	(0.873)	(1.066)
Travancore × Year=1931	11.72***	9.985***	7.587***
	(1.017)	(1.279)	(1.359)
Constant	8.813***	13.22***	13.25***
	(0.129)	(0.383)	(0.322)
Taluk FEs	Y	Y	Y
Observations	1062	274	100

Note: Estimation method is OLS, with robust (Huber-White) standard errors in parentheses. Unit of analysis is taluk. Column 1 sample: all taluks in the Madras Presidency and Travancore. Column 2 sample: all taluks in Travancore and all taluks in the Madras Presidency from districts that border Travancore. Column 3 sample: only taluks along the border between Travancore and Madras Presidency. Literacy by age-cohort data is not available for Cochin. The Madras Presidency data for 1891 provides literacy data for the following age brackets: 15-24 and 25-plus. Given that older adults were less likely to have received education in 1891, the above difference between cohorts is an underestimate. *, **, and *** indicate statistical significance at 10%, 5%, and 1% level.

Table A7: Is future Kerala different? No.

	All	Border districts	Border taluks
Year=1901	0.101	-0.183	0.403
	(0.102)	(0.537)	(0.251)
Year=1911	1.096***	1.586**	1.913***
	(0.153)	(0.772)	(0.273)
Year=1921	2.172***	2.484***	3.214***
	(0.180)	(0.827)	(0.349)
Year=1931	2.520***	3.901***	4.271***
	(0.194)	(0.752)	(0.331)
Cochin × Year=1901	-0.372	-0.430	0.0795
	(0.628)	(0.649)	(0.676)
Cochin × Year=1921	1.731	1.706	2.814**
	(1.186)	(1.238)	(1.155)
Cochin × Year=1931	8.329***	8.245***	9.962***
	(1.821)	(1.907)	(1.741)
Travancore × Year=1901	-0.180	0.104	-0.482
	(0.855)	(1.019)	(0.939)
Travancore × Year=1911	2.405***	1.916*	1.588*
	(0.749)	(1.076)	(0.829)
Travancore × Year=1921	6.823***	6.512***	5.781***
	(1.319)	(1.570)	(1.436)
Travancore × Year=1931	4.938***	3.557**	3.187**
	(1.274)	(1.490)	(1.383)
Year=1901 × Future Kerala=1	0.429*	0.770	-0.325
	(0.258)	(0.597)	(0.368)
Year=1911 × Future Kerala=1	0.774	0.205	-1.051***
	(0.507)	(0.943)	(0.359)
Year=1921 × Future Kerala=1	1.233**	0.947	-0.891**
	(0.554)	(1.018)	(0.411)
Year=1931 × Future Kerala=1	2.572***	1.276	-0.812
	(0.896)	(1.242)	(0.488)
Travancore × Year=1901 × Future Kerala=1	1.410	1.068	1.842
	(1.061)	(1.209)	(1.380)
Travancore × Year=1911 × Future Kerala=1	0.0935	0.663	1.033
	(1.065)	(1.343)	(1.311)
Travancore × Year=1921 × Future Kerala=1	2.266	2.553	2.138
	(1.663)	(1.897)	(1.814)
Travancore × Year=1931 × Future Kerala=1	2.583	3.879*	3.947**
	(1.754)	(1.978)	(1.855)
Constant	5.988***	9.201***	9.408***
	(0.111)	(0.310)	(0.278)
Wald test (Travancore vs. Kerala, 1931)	0.124	0.163	0.007
Taluk FEs	Y	Y	Y
Observations	1401	407	171

Note: Estimation method is OLS, with robust (Huber-White) standard errors in parentheses. Unit of analysis is taluk. The p-value of the Wald test of Travancore × 1931-Kerala × 1931= 0 is reported below the table. Column 1 sample: all taluks in the Madras Presidency, Travancore, and Cochin. Column 2 sample: all taluks in Travancore and Cochin, and all taluks from districts that border these polities. Column 3 sample: only taluks along the borders between Cochin, Travancore, and Madras Presidency. *, **, and *** indicate statistical significance at 10%, 5%, and 1% level.