

The Societal Origins of State Education^{*}

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Abstract

Historical accounts on increasing state control over education are predominantly set in contexts with the rise of strong modern states. But, can states assert control over education while operating under severe fiscal constraints, and also facing competition with existing providers in society? I look at the history of education in colonial states to show when such expansion is possible. I argue that, while governments initially relied on societal providers for education, state expanded their control during periods of high local resistance, building their own system in competition with societal providers. Using original panel data of 33 British Burma districts over two decades (1901-20), I show that, only among the districts with high Buddhist male literacy (measuring indigenous education level), rising number of riots and unlawful assemblies since 1901 (measuring resistance) was positively associated with female enrollments, a key measure of state involvement since few indigenous monastic schools admitted women. Theoretical implications from this paper can help us better understand state-building processes in fiscally constrained states, and the important role societal institutions played in the development of state institutions.

Keywords: colonialism, education, resistance, Burma (Myanmar)

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Education is an essential function of the modern state. Most governments around the world today have designed policies to assert control over teacher training, curriculum design, and school construction, among many other tasks involved in providing education for children and adults within their territories. In fact, state-provided education is more widespread than ever; as of 2020, 155 countries guarantee compulsory education for a minimum of nine years of primary and secondary education, ensuring (at least nominally) some level of schooling for every child.¹

What are the origins of such state involvement in education? Existing research in political economy assumes that education is a good that governments can distribute for economic and social benefits, in return for political legitimacy. Based on this logic, they investigate the role of political regimes and economic needs in motivating state involvement (Ansell and Lindvall 2013; Harding and Stasavage 2014; Lindert 2004). In contrast, noting that several early attempts to extend control over education preceded democratization, studies in the state building literature portray education as a tool to instill individuals' beliefs about the state, providing them with necessary skills and motivations to challenge its internal and external opponents. Changes in education policy during periods of internal and external conflict feature prominently in these studies (Aghion et al. 2018; Paglayan 2020; Testa 2018). Most of these accounts are set in contexts where states were simultaneously expanding in their fiscal capacity.

I then examine this relationship between societal resistance and state involvement in education in the context of colonial states, which operate under significant fiscal constraints (Frankema 2011). While colonial states are known for physical coercion and resource extraction, as in the traditional narrative of “night watchman” states, much variation lies in their investments in education, especially during the first half of the twentieth century. Figure 1 shows the relative changes in primary school enrollment ratios between 1900 and 1950 for selected colonies at the time, based on the data by Lee and Lee 2016. The figure suggest a substantial variation in the development of education provision across colonies. For example, Japanese colonies of Korea and Taiwan started with enrollment ratios below 10 percent in 1900 and grew to 86.91 percent and 100 percent, respectively. Variation still exists even when controlled for the metropole; for example, some French colonies such as Niger remained close to 0 percent of primary school enrollment,

¹Data from UNESCO. [Link here.](#)

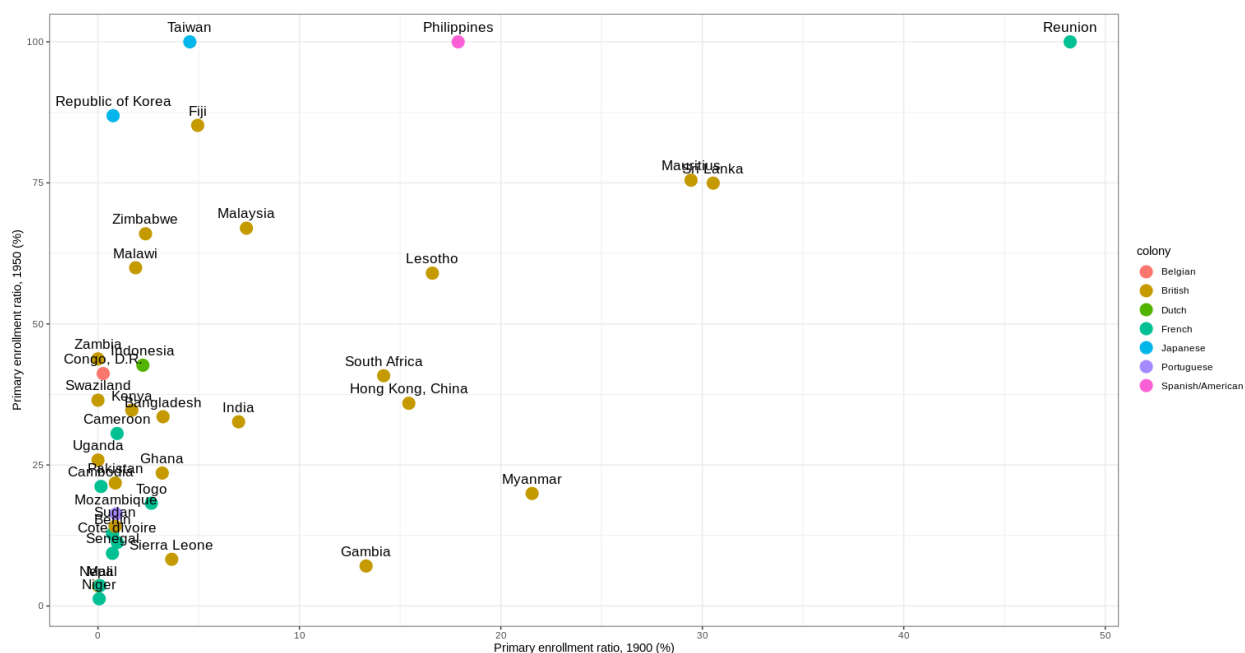


Figure 1: Scatter plot of primary enrollment ratios for selected colonies in 1900 and 1950. Enrollment ratio is the total number of primary school enrollment divided by total number of children in primary-school age group. Different colors represent different colonial metropolises. Data from Lee and Lee 2016.

while, others such as Cambodia grew from 0 percent to nearly 25 percent over the five decades. Therefore, rather than neglecting education at all or converging towards a global phenomenon, colonial education is a outcome of substantial variation that remains to be explained.

In pursuing such explanation, I bring attention to an important element in the existing discussions on the history of state education policies: the tensions that arose between the state and existing societal providers in control over schooling, and the resulting variations in state's relationship with societal providers. Looking further across diverse contexts, we can see a significant but unexplained variations in state policy towards societal providers, where in some, after government involvement, groups such as local elites and missionary societies worked together with the state (Chaudhary 2009; Lankina and Getachew 2012), while in others, bureaucrats appointed by the state took a pivotal role (Hong and Paik 2018; Soifer 2013). This variation presents a puzzling question: why would states ever directly involve themselves in education when education could be cheaply provided through societal organizations and building a new system involved enormous fiscal costs?

To tackle this puzzle, I introduce a new theory of state involvement in education, which proposes

two factors that explain the variations in the state's educational involvement: the presence of existing societal organizations that provide education and the local resistance against state control. When local resistance is low, the state limits its involvement in the places where societal organizations are already providing education. Instead, it supports and cooperates with these organizations to accumulate human capital and train bureaucrats without facing the costs of establishing a new system from the ground up. When local resistance is high, however, ideological conversion becomes the primary motive behind state involvement; this translates into the increased control or replacement of existing non-state providers so that the state can assert more control over educational content.

To evaluate the theory's empirical implications, I focus on British Burma given the extensive system of Buddhist monasteries, where most Buddhist males received education, in its predecessor state. I manually construct panel data of British Burma districts between 1901 and 1920 from detailed district gazetteers and censuses. District gazetteers provide detailed information on colonial education, which I combine with the census data on Buddhist male literacy and the number of monks as measures of indigenous education level.

Estimated Ordinary Least Squares (OLS) results lend empirical support to theoretical expectations. Correlation coefficients between local involvement in education, measured by school enrollments, and Buddhist male literacy become more positively associated with increasing anti-colonial resistance, measured by the number of riots since 1901 in a given district. Main results focus on female attendance, an important measure of state involvement as few indigenous schools provided education for women; similar results also hold for overall attendance. I also find that the results are not driven by factor endowments or the presence of missionary activity.

The findings provide a refreshed perspective on the purpose of mass education in the state by explaining its evolution over time. By doing so, this paper connects the explanations that conceptualizes education as an economic good for redistribution (Ansell and Lindvall 2013; Ben-Porath 1967). and production, and those that emphasize education's potential for forming national identities (Bourguignon and Verdier 2005; Testa 2018; Weber 1976). Rather than emphasizing either purpose, this paper instead suggests that their relative importance in state education policy changes in response to the factors in so-

ciety. While economic incentives initially drive states to rely on societal providers as a cost-minimizing strategy, increasing resistance against the state necessitates government intervention in education provision by replacing societal providers with those under stronger state control.

The findings also build on the growing research on the emergence of mass education under non-democratic states (Aghion et al. 2018; Paglayan 2020). Departing from the political economy literature that emphasizes democratic institutions as a key driving force behind education provision (Go and Lindert 2007; Harding and Stasavage 2014; Lindert 2004), they argue that early instances of state involvement in education happened during non-democratic regimes, and explain the phenomenon by factors such as military rivalry and internal conflict. In particular, this paper builds on Paglayan's work evaluating the relationship between internal conflict and state involvement in education after the 1859 Chilean Civil War (Paglayan 2017). While similarly theorizing state involvement as potentially motivated by the desire to instill obedience to the state, I additionally emphasizes a critical component in expanding education provision: the changing relationships between the state and existing societal providers. The findings the need to conceptualize state involvement in education not simply as a process of expansion but as one of interaction with, or even the replacement of, existing organizations in the society.

Finally, by examining the colonial education policy's response to pre-existing indigenous providers, the findings contribute also to the literature tracing the origins of colonial institutions to indigenous political history. Particularly, it contributes to the ongoing discussions about the origins and consequences of direct versus indirect rule in colonial states.(Mamdani 1996; Lange, Mahoney, and Vom Hau 2006). Extending from this concept, I show how a specific institution that existed for centuries before colonial rule (in this case, education) played a role in the development of colonial institutions. This also connects the paper's findings with the new literature on the long-run consequences of pre-colonial political institutions, as well as with the literature on the development of colonial education in Asia and Africa (Hong and Paik 2018; Huillery 2009; Lankina and Getachew 2012; Ricart-Huguet 2020).

I Origins and Development of Education

What can the existing theories of education inform us about the development of state involvement in education? Here, I argue that some prevalent mass education theories are not useful in addressing the question, namely median voter-based theories and world system theories. I will then propose four sets of theories and discuss their potential explanations: social conflict, skills training, evangelization, and propaganda. Lastly, I discuss the ability of these theories to explain the policy transition from the earlier support for indigenous education providers to their later replacement with secular and missionary schools.

Median voter-based theories argue that government provision of education is driven by individuals who can demand the government for more investment in education with a credible threat of voting out of office (Ansell and Lindvall 2013; Harding and Stasavage 2014; Stasavage 2005). The government, preferring re-election, will provide education that matches the demand from the median voter.² This logic is driven by classical economic theories that model individual education decisions in terms of a cost-benefit analysis and median-voter theories that place the policy preferences by the electorate's median voter as a key determinant of government policy (Ben-Porath 1967; Meltzer and Richard 1981). However, the initial expansion in education appeared across non-democratic states, and these theories cannot explain their development in such contexts. This is also true for colonial states, where the government is not accountable to most of the population in their colony throughout most of the period of their rule, limiting their ability to explain colonial education development.

World system theories argue that international education development was a result of ideological transmission from the core to the periphery. The students, teachers, and schools from the latter obtain their resources and skills from their peers in the former (Meyer, Ramirez, and Soysal 1992). These theories derive from the assumption of states' system under a capitalist economy, where the hegemony of

²Several theoretical variations exist. For example, Ansell (2010) combines median-voter-based theories with varieties of capitalism (VoC) research to explain government education policy as a response to political regime and industrial policy. Hicken and Simmons 2008 explore the role of personal versus party vote systems to explain education spending. Go, and Lindert 2007 build a theory that argues education costs, decentralized government, and the distribution of voters' voices altogether explain relatively high school enrollment in nineteenth-century northern American states versus their southern counterparts.

some states (cores) over others (peripheries) reproduces through numerous institutions, including education (Wallerstein 1974). However, these theories cannot explain the variations across and within states in their education policies or how local conditions drive the development and implementation of education policies.

Social Conflict: This set of theories emphasizes the local elites' role in implementing education policies and how their interests drive the level and type of education provided. They come from a larger set of social conflict theories that emphasize education as a product of interest group relations, for example, the ruling class versus the working class and the colonial government versus the indigenous elite. For example, Cantoni and Yuchtman (2013) model education as a strategic decision faced by political elites and argue that the elites provide education only when the cost of subsidies is low, and the content is not threatening to their political survival (Cantoni and Yuchtman 2013). Hauk and Ortega (2020) instead focus on cross-regional production opportunities as an important factor for the elite's education policy (Hauk and Ortega 2020). In colonial contexts, Hong and Paik (2018) empirically show that the extent of indigenous educated elites, measured by the Joseon civil exam passers, is positively associated with literacy rates during colonial rule due to the elites' investment in private education (Hong and Paik 2018). Elites were also an important determinant of education policy that contributed to economic inequality in the Americas (Engerman and Sokoloff 2012).

Skills Training: When governments face a terrain where few were trained in administering the state, this could limit the economic potential for the state as well as its competitiveness when there were rivalrous states (Aghion et al. 2018). Therefore, the government finds it necessary to invest in education to create a cheap and skilled force of bureaucrats. This also applies to colonial contexts; in his discussions of colonial education in Southeast Asia, Furnivall 1948 points out the need for bureaucracy the existential purpose of colonial education. Similarly, in West Africa, existing research argues that colonial education mainly produces local bureaucrats, and the district that received education investments became the key skilled labor source in post-independence bureaucracy (Huillery 2009; Ricart-Huguet 2020).

Evangelization: This argument often appear among the discussion on educational development in colonial states. They emphasize the role of Christian missionaries in spreading education across colonial

states. For example, Lankina and Gitachaw (2012) showed that missionary societies were key promoters of education in colonial India, and their influence persisted in post-independence democratic development (Lankina and Getachew 2012). These theories come from the “Protestant work ethic” hypotheses, which argues a strong link between Protestantism and investment in education as well as other downstream outcomes.

Propaganda: These theories argue that the key purpose of education is to create loyal subjects to the state and demobilize potential resistance (Bourguignon and Verdier 2005; Testa 2018). Pointing out that the rise of mass education in several non-democratic states across Europe, decades before the spread of electoral democracies, Paglayan (2017) argues that mass education’s key purpose is to “to instill values of order, obedience, and respect for the rule of law that, elites hoped, would help prevent future mass rebellions against the state’s authority” (p.3) (Paglayan 2017).

We can organize these theories along two dimensions: the key actor behind education policy and the purpose of education (Table 1). In terms of the key actors involved, social conflict theories and evangelization theories emphasize the non-state organizations (elites and missionaries) as important actors in providing education; while allowing their provision may be part of the state’s policy, its role is delegated to the background. In contrast, skills training theories and propaganda theories emphasize the state as the key actor in providing education, either to training its bureaucracy or instill a national identity among the population.

In terms of education’s purpose, the theories differ in whether they focus on education’s role in producing economic returns or ideological conversion. In social conflict and skills training theories, education is important for economic returns, either for the elites or the government. In contrast, evangelization theories and propaganda theories focus on education’s ability to transform ideology, either in religious belief or loyalty to the state.

Organizing the theories along the two dimensions also reveals potential rooms for improvement in existing research. First, existing theories do not discuss when colonial states start to provide education instead of solely focusing on physical coercion or when the replacement of indigenous education systems occurs, which appeared across several colonial states in Southeast Asia. Second, the research remains

Key Actor	Purpose of Education	
	Economic Returns	Ideological Conversion
Non-state	Social Conflict	Evangelization
State	Skills Training	Propaganda

Table 1: Four Theories to Explain State Involvement in Education

divided on whether colonial education was driven by economic or ideological concerns. I plan to address both of these points in my theory by (i) showing the conditions under which the colonial state replaces indigenous education, and (ii) showing how the two roles of education (economic and ideological) shifted in their relative importance over time.

2 Theory

The theory focuses on the interaction between the state and the indigenous society in one specific institution, education, after colonization. While my theoretical development focuses on colonial context, given the key empirical case being British Burma, the basic argument can be extended to non-colonial contexts. It should be noted, however, that the theoretical context is limited to cases where societal organizations are providing substantial levels of education before involvement by the state so that the latter can decide on its relationship with pre-existing providers.

I define colonization as a form of regime change where the state's distribution of political power shifts from an organization centered within the state (indigenous organization) to an organization centered outside the state (foreign organization). This differentiates colonization from other forms of regime change such as domestic political transitions (indigenous to indigenous), colonial transitions (foreign to foreign), and independence (foreign to indigenous).

The definition implies that colonization leads to a unique context for institutional change where the colonial government, controlled by the foreign organization, attempts to assume control over the indigenous organization. However, the indigenous organizations do not immediately fall under state control for two reasons: the limited extent of state-society interactions and the predecessor state's reliance on patron-client ties. First, in several early modern states, the ruler's infrastructural power is limited to

the political core and declines with increasing distance from the core (Pierskalla, Schultz, Wibbels, et al. 2017). This means most people outside the core had little interaction with the state, regardless of the ruler. Second, even in places that experienced some interaction with the state, most of this occurs through patron-client relationships between the ruler and the local bureaucrats or elites (Lieberman and Buckley 2012; Weber 1976). Since patron-client relationships build on the actors' personal relationship, the advance of a new ruler necessitates a renewal of those personal ties for administration.

Facing limited control, the government's most direct approach to increase control over indigenous society in non-democratic states is repression through physical violence. For a fiscally constrained state in its early formation, physical violence serves as the cheapest and most immediate tool to provide control over the society in the state's favor, compared to the other alternatives that require more complex use of fiscal and human resources, such as transport infrastructure, mass resettlement, and education provision. While these alternatives are concurrently valid choices, only physical violence satisfies the state's existential purpose in Weberian terms: to claim monopoly over the legitimate use of physical force. To do this requires the state to invest in its coercive capacity, particularly in places where the control by the previous state is limited.

While physical repression serves the state's existential purpose, it does not satisfy the colonial government's key motivation to achieve control: to maximize economic benefits for the government. That is, while repression allows the government to coerce indigenous people into its economic activities and protect its assets from destruction, it does not provide the necessary infrastructure to expand and optimize the economic returns, such as roads, train stations, revenue offices, courts, hospitals, and schools. Therefore, there is sufficient interest in pursuing economic benefits, the government with economic interests should move beyond physical violence towards those that yield economic benefits to the colonial state.

This is where the colonial government's interest in education comes in. Investment in education allows the government to increase its economic benefits through two channels: bureaucratic capacity and tax base. First, the colonial government needs a cheaply available and skilled labor force to supply its bureaucracy, which in turn is necessary to pursue numerous state activities in agriculture, tax collection, transport, forestry, and healthcare, among several others. Therefore, in order to reap economic benefits

through state activities, the government should take the fundamental step to ensure that a portion of the population is sufficiently educated to successfully implement its activities. Second, assuming positive private returns to education, a more educated population earns higher incomes and therefore provides a larger tax base for the state. The channel would become even more economically important if education increased participation in the formal economic sector, and therefore tax compliance.

But how does the government go about investing in education? In answering this, I depart from existing theories by arguing that any government education policy initially faces an uneven landscape of pre-existing education levels due to the presence of indigenous education providers. Therefore, after deciding to involve in education, the government has two options: to rely on the existing system by supporting indigenous providers (limited involvement) or to replace them by developing a system of its own (expanded involvement). While each option increases state involvement in education, they each respond differently to what I term as a “cost-control trade-off,” that is, the negative relationship between the fiscal and political costs that come with state involvement and the extent of government’s control over educational development of students.

Under limited involvement, the government’s role in education is mainly financial, supporting indigenous providers with their work in educating the society. This can come in the form of financial grants, scholarships, and dedicated funds. At the same time, control over education content is limited; involvement is mainly in terms of support and recommendations rather than direct administration over the content. This is a more cost-efficient option than expanded involvement because the government does not have to invest in building new schools and recruiting new teachers extensively, and instead relies on the already existing educational apparatus. This option, however, requires a sufficient level of pre-existing providers that the government can employ; in other words, the choice between direct versus limited involvement does not exist when there is no system for education provision in place.

The option also represents the government’s focus on education’s purpose to generate economic benefits rather than to create a loyal indigenous population and mitigate potential anti-colonial resistance. As mentioned before, limited involvement implies control over provision but not over content; while financial support may encourage an increase in enrollment, it will not necessarily allow the government

to shape how its recipients are educated and how such education affects the student's opinion towards the state. That is the key drawback of limited involvement: the potential to create increasingly educated individuals and when combined with indigenous control over education content, fuel the strength of anti-colonial resistance.

Under expanded involvement, however, the government's involves beyond financial support, actively developing policies that push the state as the key education providers above all else. This can come in the form of building new channels of education provision that compete with existing organizations. While demanding more financial and human resources, this option has one important benefit that limited involvement struggles to achieve: the ability to control content. Unlike its counterpart, expanded involvement represents a focus on education's purpose as a tool to address potential anti-colonial resistance from the indigenous society.

The conditions that determines when the state directly involves and competes with societal organizations in goods provision also builds on the theory of coercive distribution as proposed by Albertus, Fenner, and Slater 2018. Their theory argues that, in non-democratic states, governments strategically distributes goods and services within their territory to consolidate their rule. This is achieved in three stages: (1) displacing the organizations that provides the goods, (2) enmeshing the government-provided goods in such a way to increase the society's dependence on the state, and (3) maintaining the newly reoriented state-society relations with regular upkeep.

This theory makes two key departures from coercive distribution theory. First, it does not assume coercive displacement as a necessary stage. By pursuing an enmeshment process where choosing state-provided services over the societal alternative can yield economic benefits (e.g. higher job prospects from state-provided education instead of traditional monastic education), states can manipulate societal demands for competing services, thereby indirectly displacing them. Second, it implies education's difference from other goods and services in that education can not only shape economic dependence on the state, or legibility to the state, but also influence loyalty to the state via ideological change.

What factors influence the government's decision between limited involvement and expanded involvement? I argue that indigenous education levels and anti-colonial resistance are the two key factors in-

fluencing the decision. Specifically, when anti-colonial resistance is low, the government chooses limited involvement, where education provision attempts to rely on pre-existing providers. When anti-colonial resistance is high, however, the government chooses expanded involvement, where education provision attempts to replace indigenous providers.

Formalization of the argument is included in the Appendix. Based on the theory, I expect that, in the context of British Burma, anti-colonial resistance conditions the overall relationship between indigenous education levels and state involvement in education. This expectation has three testable hypotheses. First, indigenous education level is negatively associated with state involvement in education absent of anti-colonial resistance (Hypothesis 1). Second, when resistance is sufficiently high, indigenous education level is positively associated with state involvement (Hypothesis 2). Third, in order for the second implication to be true, the interaction term between indigenous education level and anti-colonial must be positive (Hypothesis 3).

3 Historical Background

The present-day territories of Burma (Myanmar), along with most territories in mainland Southeast Asia, came under colonial rule late in the nineteenth century. In fact, for more than a century, they were under indigenous pre-colonial states, such as the Konbaung Kingdom and Dai Viet, that were going through unprecedented levels of political consolidation; by the end of the eighteenth century, only three states remained (Konbaung Burma, Dai Viet, and Siam), down from 33 in fourteenth-century (Lieberman and Buckley 2012, p. 1085). They also experimented with new administrative reforms, such as the introduction of land revenue inquests, (Trager and Koenig 1979). creation of new administrative units, (Paik and Vechbanyongratana 2019). and transformation of village organization in expanded territories (Dell, Lane, and Querubin 2018).

Despite political consolidation in many state aspects, education remained largely under local control until colonization; in Konbaung Burma, Buddhist monasteries (*kyaung* in Burmese) were primary providers. Prevalent throughout Buddhist Southeast Asia (present-day Burma, Cambodia, Laos, and

Thailand), these monasteries were centers of learning for reading, writing, mathematics, and religious teaching, and educated local male children from early childhood to adulthood. Monks were the primary teaching staff, and their compensation was limited to daily alms and donations. Facing limited attempts towards incorporation under state control, they formed a large network of free indigenous education providers, as they were for centuries under multiple Burmese kingdoms.

Different parts of Konbaung Burma came under British colonial rule via three Anglo-Burmese wars between 1824 and 1886 (Figure 1). The aftermath of the third war, which resulted in the colonization of Upper Burma and spelled the end of the Konbaung kingdom, was far from smooth incorporation, however. Rebellions against the new imperial power broke out across the territory, followed by a decade of political repression known as the Pacification Campaign. This involved physical suppression of anti-colonial rebels with military police (often bringing troops from India), replacement of hereditary village headmen with appointed headmen, and reorganization of pre-colonial administrative units. The efforts were overall successful at suppressing resistance, with political order largely secured by 1895.

Despite repression and reform of pre-colonial institutions, colonial administrators quickly noticed the potential of Buddhist monastic schools as a basis for colonial education. In an early report on public instruction, administrators noted a high level of literacy thanks to monastic education, and focused on financially supporting these schools and increasing coordination between them and other schools such as missionary schools and government schools. As Sir Arthur Phayre, the Director of Public Instruction in 1864, said:

“As a general rule, it may be stated that all instruction among the Burmese people is carried on in the monasteries. There are a few private schools here and there, but they are exceptional. There is no other regular plan or system of schools which should be taken in hand and improved. I would not recommend that Government should set up schools in the villages as additional or in opposition to monasteries; such a scheme would be inevitably a failure.”³

³Campbell, A. (1946). Education in Burma. *Journal of the Royal Society of Arts*, 94(4719), p. 441.



Figure 2: British Burma districts by the time of colonization. Dark gray represents areas colonized in 1826 after the First Anglo-Burmese war. Light gray represents areas colonized in 1852 after the Second Anglo-Burmese War. White represents areas colonized in 1886 after the Third Anglo-Burmese War.

However, a policy shift occurred in later stages of colonial rule, as evident from the changes in the government recognition of schools, which was required for government financial assistance and therefore indirectly represented its policy changes. At its peak in 1893, there were around 4,619 recognized monastic schools, against 967 recognized lay schools; by 1933, there were only 907 recognized monastic schools left, against 4,993 recognized layperson schools.⁴ Figure 3 shows a visualization of the changes in monastic

⁴Monastic schools (*phone-gyi-kyauung*) were schools set up at monasteries that traditionally provided education in reading, writing, arithmetic, and religious knowledge to young Buddhist males. Lay schools (*cain-kyauung*), on the other hand, were village schools set up by laypersons that were open to both males and females. Few existed before colonial rule, after which

and lay schools over time.

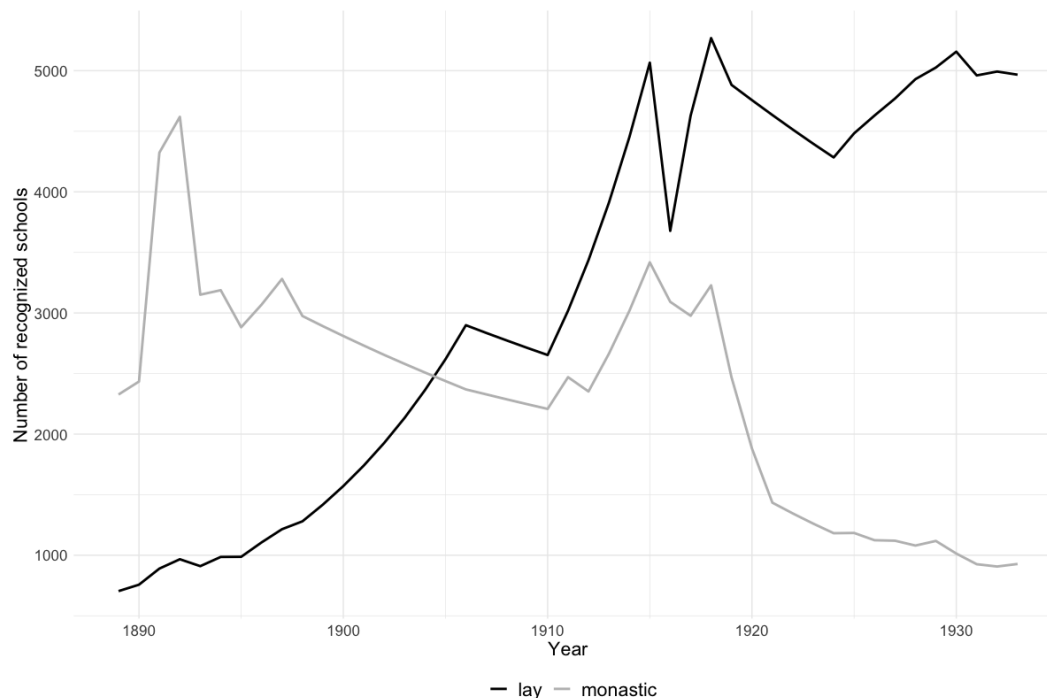


Figure 3: Number of monastic schools and layperson schools in British Burma, 1890-1934. Note that the values for some years are interpolated. Data from *Report of the Vernacular and Vocational Education Reorganization Committee, 1936*, p. 137-138.

A quote from the 1936 report by the Vernacular and Vocational Education Reorganization Committee, which was created for the formulation of a new education policy for British Burma, provide some explanation for this shift:

“We believe that a sound and lasting system of vernacular education can be built upon these lines. It would have the merit of sweeping away the anomalies of the past while at the same time retaining all that at present honestly makes for progress and efficiency in the education of the country. Nor do we apprehend that the monkhood will be blind to the advantages that such a system will confer on those who devote themselves to the efficient teaching of the children of the country ... It is undesirable to compete with the head of the village monastery and undermine his authority by the indiscriminate establishment of lay schools, but educational development cannot wait indefinitely that slow dissolution of ancient prejudice.”⁵

they expanded in number and became the government’s preferred channel to provide secular education, in contrast to the male-only religious education provided by monastic schools.

⁵Vernacular and Vocational Education Reorganization Committee (1936), p. 141-143.

Monastic schools, once treated as the colonial state's preferred medium for providing education to the masses, were now considered by the government to be the impediment to the progress of the colonial education project. By "these lines," the report referred to "putting the monastic and the lay school on equal footing, and according to them both the same treatment" (p.141). However, the situation was far from equal footing because the monastic schools had significantly declined in their importance to colonial education.

Did this shift also represent the colonial state's increasing interest towards pursuing ideological change? I present here two pieces of evidence suggesting not only the proposals for ideological change through state-controlled education was formulated among colonial government officials, layperson schools also appeared as an institution of choice for implementing such a change. First, noticing the high levels of crime and riots against the state, the quote from a report explained the need to instill the "Imperial Idea" and create political order through loyalty to the state.

"[Imperial Idea] implies on the part of the Burma an active loyalty to the imperial connection which can only be produce on the basis of sentiment. It is therefore the duty of education to appeal to that sentiment and to teach him as an individual that fidelity to principles and right is the bedrock on which loyalty is founded, to teach him as a Burman that it is only out of love of his country and belief in its future that active loyalty to Empire can be developed, to teach him as a citizen of Empire that his liberty and prosperity depend upon the maintenance of the Imperial connection."⁶

In a separate report, layperson schools were proposed as a promising platform, especially compared to other alternatives, to expand the education system and at the same time instill political order through schooling.

"An agency which is going to teach self control, and build up a new resistance, must therefore be one which is represented in every village of any considerable size. The civil servant, the policeman, the headman, are alike unsuitable for the purpose. They have their responsible duties to perform, which cannot easily be combined with the new functions suggested. It is necessary to find the growing force in the village of the future, and to harness that to the task of the prevention of crime. That growing force, now in its infancy, but destined inevitably to grow in numbers and in value, is the lay vernacular school of the village. Already these

⁶Report of the Committee Appointed to Ascertain and Advise How the Imperial Idea May be Inculcated in Schools and Colleges in Burma (1917),p.2.

schools exceed the monastery school both in number and attendance. It would seem that the educational policy of the Province was now so surely settled, that the monastery school will not again be considered as a possible foundation for the educational system. It may therefore be regarded as certain that the lay schools will increase while the monastery schools decrease, both in number and effect."⁷

4 Data

To evaluate empirical implications from the theory, I estimate the conditional relationship between indigenous education providers and state involvement in education using district-level panel data from British Burma, covering 33 districts and 20 years between 1901 and 1920. This data is constructed from a variety of colonial government documents and contains district-year-level information on demographics, local economy, criminal cases, and education, among others. Due to limitations in data coverage, I limit the analyses to 33 districts, excluding the following six districts (all in Frontier Areas): Arakan Hills, Chin Hills, Kayah State, Salween, Shan State - North, and Shan State - South.

I rely on two colonial administrative records for primary data collection: decennial censuses and district gazetteer. The former covers population, literacy, and occupation data, while the latter provides detailed geography and socioeconomic development by year. The district is the main unit of analysis for two reasons. First, most information, particularly education, is not available below the district. Second, the unit is substantively important because colonial administrative decisions are implemented at the district level by district commissioners.⁸

4.1 Indigenous Education Level

Data on indigenous literacy comes from the five decennial censuses conducted throughout British Burma. The first 'modern' census, which is a complete and synchronous count of the population over the entire territory, (Baffour, King, and Valente 2013) was in 1891,⁹ six years after the colonization of Upper Burma¹⁰.

⁷Report on Prevention of Crime and the Treatment of the Criminal in Burma, 1926, p. 17.

⁸Beckett 2019; Iwaki 2018.

⁹Note that Lower Burma, which was fully colonized by 1852, saw two additional censuses, the first colonial census in 1872 and the first synchronous census in 1881.

¹⁰While definitions may vary, official classification by the colonial government includes territories annexed before 1886 as Lower Burma and those annexed after as Upper Burma. See Figure 1.

Altogether, five decennial censuses were completed before the Second World War and independence: in 1891, 1901, 1911, 1921, and 1931. This paper makes use of the first four censuses.

The censuses contain valuable information on numerous demographic and socioeconomic characteristics, such as age group, sex, birth origin, education, and occupation, among others. This information is aggregated at province, district, and township levels; granularity, however, varies; for example, the population is available as low as the township level, while others, such as literacy is only available at province and district levels (See Figure 4 for the patterns of literacy in 1901 and 1920).

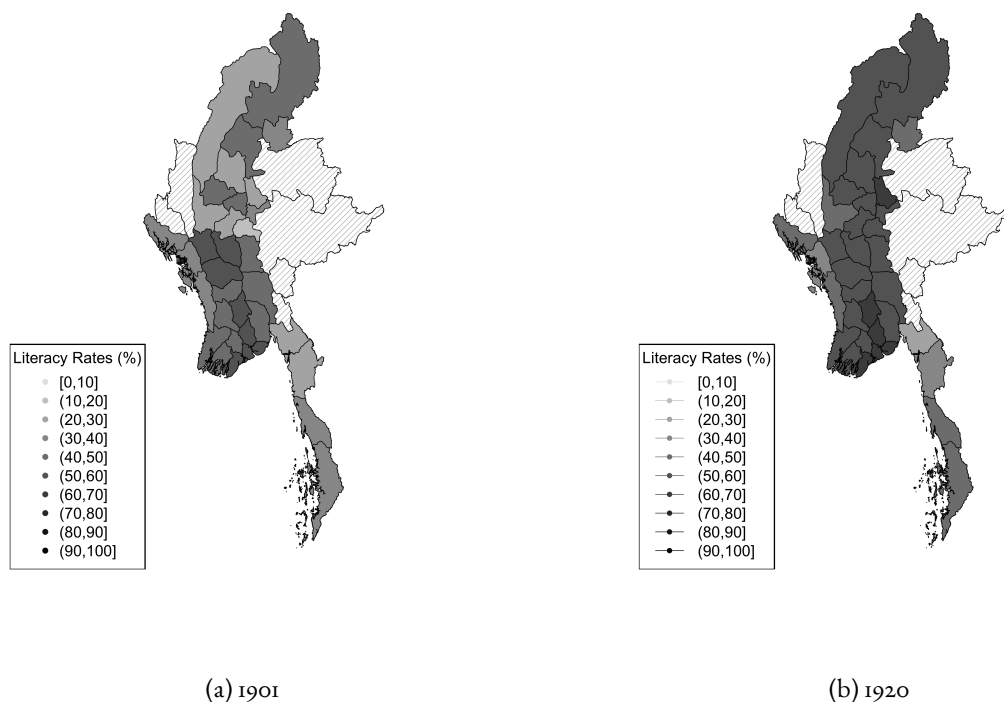


Figure 4: Buddhist male literacy rates by district in 1901 and 1920. Darker colours represent higher levels of literacy. Data from British Burma Censuses in respective years. Shaded areas represents parts of the indirectly-ruled Frontier Area for which colonial education data is not available.

To measure indigenous education level, I use Buddhist male literacy as the number of Buddhist males who can read or write in Burmese, which is available from census population counts by literacy, religion, gender, and age group; all five censuses provide this. Learning in monastic schools was traditionally limited to Buddhist males, and the practice continued even under colonial rule despite the government's

push for girl's inclusion. Therefore, literacy among Buddhist males can give us one of the best approximations of how widespread are indigenous education providers in a district.

For the missing data in inter-censal years, I produce the estimates based on the United States Census Bureau's method for inter-censal estimates, also known as the Das Gupta method.¹¹ It essentially assumes that the values from the earlier census move towards those from the later census in a geometric progression.

4.2 State Involvement in Education

District gazetteers are a type of archival document unique to former territories of British India, including British Burma. They were compiled at the district level and were representative of a colonial attempt to understand the local conditions and facilitate internal communications with local bureaucracy to form and implement policies. As such, they contained detailed information on numerous sectors of local development, such as population, cultivated area, type of crops grown, forestry, crime, education, health, and many others. There are four series in total, with the first series starting in 1833. However, only three were collected across districts in British Burma: 1904-1905, 1911-12, and 1924-1925. Here, I use data from two: 1911-12 and 1924-1925.

Another useful feature of the series is that data coverage goes beyond a single-year snapshot for several sectors, thereby providing an opportunity to analyze their temporal trends in the form of panel data. A typical section contains a summary table that lays out thematically compiled information for ten preceding years: 1901 to 1911 for the first series and 1911 to 1920 for the second series (see Figure 5 for an example snapshot of a table).

For this paper, I collected the following data on education.

- Education expenditure - Amount of spending on education within the district in rupees. This is separated into two: provincial expenditure, which represents funding from central government, and district expenditure, which represents funding from district tax revenues.

¹¹See United States Census Bureau 2012.

- Number of schools - Total school count within the district, broken down by level (lower primary, upper primary, middle, high, and technical). The number of private schools is available for Upper Burma districts only. and primary school figures are only available as aggregate (not as lower and upper) for Upper Burma districts.
- Daily attendance - Daily attendance in schools within the district, broken down by level (primary, middle, high, and technical), and by gender.

4.3 Additional Variables

Other additional data I collected are as follows.

- Area - District's total area in square miles. This is also broken down into following categories: cultivated/uncultivated area, area by crop, and area under forest reservations. The values may also change due to changes in administrative borders.
- Tax revenues - Amount of local taxes collected within the district. This is broken down into various types, such as land tax, income tax, fishery tax, and so on.
- Number of criminal cases - The total number of criminal cases in the district. In particular, I use cases of riot and unlawful assembly as a measure for anti-colonial resistance.
- Christian population - Number of Christians by the district. This is available from the censuses.

5 Empirical Analysis

5.1 Estimation Strategy

I use a two-way fixed effects model to estimate the extent to which anti-colonial resistance conditions the relationship between indigenous education levels and colonial involvement. The basic regression model for empirical strategies is as follows.

$$coledu_{it} = \beta_0 + \beta_1 iedu_{it} + \beta_2 resist_{it} + \beta_3 iedu_{it} \times resist_{it} + X\beta + \gamma_{it} + T_{it} + \epsilon_{it} \quad (1)$$

where, $coledu_{it}$ represents colonial educational involvement in district i at time t . We have two sets of measures for this variable. First, we have education outcomes for both genders including the number of schools and enrollment by level (primary, middle, and basic as the sum of primary and middle, and technical). Second, we have education outcomes only for females, including same levels as the enrollment outcomes for both genders.

$iedu_{it}$ represents indigenous education level. I measure this with the number of literate Buddhist males, as the majority of indigenous education centered around Buddhist monastic schools. Instead of using the literacy rate, I use the number of literates along with population as a control variable, as the latter can potentially confound the relationship between other right-hand-side variables and dependent variables. To address concerns with reverse causation both literate population and total population are census-lagged, meaning they are from the latest-available census of a given district-year.

$resist_{it}$ represents anti-colonial resistance level; here, to capture the long-run dynamic of the variable, I measure it as the stock variable, that is the total number of riot and unlawful assembly cases between 1901 and time t , as available from district gazetteers.

Our value of interest is β_3 , the interaction coefficient between indigenous education level and anti-colonial resistance: $iedu_{it}$ and $resist_{it}$. When the interaction is positive (negative), we can interpret that indigenous education level additionally increases (decreases) colonial involvement in education upon the increase in anti-colonial resistance.

γ_i and T_t are district and time fixed effects, respectively. The former controls for district-level time-invariant characteristics as potential confounders; the latter controls for time trends in both dependent and explanatory variables. ϵ_{it} is the error term.

5.2 Main Results

5.2.1 Female Education Outcomes

Female enrollment numbers are much more valid measures of state involvement since monastic schools did not generally accept female students.¹² Therefore, if we see estimated coefficients as expected by our hypotheses, we can more confidently claim the proposed relationships between indigenous education level, anti-colonial resistance, and colonial involvement.

Table 2 show the OLS results for the second set of measured variables, including both genders, based on Equation (1). The four columns represent resulting involvement at the student level: female enrollment in primary, middle, basic, and technical schools. All rules from the preceding results apply. Estimated coefficients for Buddhist male literacy are consistently negative for all variables except middle enrollment. All of them contain the null estimate in their confidence intervals. Similar to the previous results, interaction coefficients are also consistently positive across all variables, as seen from the table. Coefficient sizes range from 0.1348 (technical enrollment) to 0.6652 (middle enrollment), implying that, if the cumulative number of riots increased by one standard deviation, the correlation coefficient between Buddhist male literacy and enrollment increased by as much as nearly two-thirds of the standard deviation.

Finally, graphical evidence from marginal effects shows that the changing levels of anti-colonial resistance substantially change the relationship between indigenous education level and colonial education except for technical education (Figure 5). As the cumulative riots increases from sample minimum to sample maximum, it switches the linear marginal effects of Buddhist male literacy from negative to positive for primary (-0.24 to 1.92), middle (-0.98 to 2.96), and basic enrollment (-0.46 to 2.31). Bin estimates are also similar to the results with all enrollments.

¹²Tipton 1981.

The marginal effects of cumulative riots also change with the changing levels of Buddhist male literacy (Figure 6). As Buddhist male literacy increases from sample minimum to sample maximum, marginal effects of cumulative riots switch from positive to negative for primary (-1.07 to 0.63), middle (-1.92 to 1.2), and basic enrollment (-1.37 to 0.83). In terms of binned estimates, the lowest quartile intervals are strictly negative for all outcomes, while highest quartile intervals are strictly positive for primary and basic enrollment. Overall, as with those including all enrollments, the results here suggest the conditional relationships between indigenous education level, anti-colonial resistance, and colonial education.

	<i>DV: Total female enrollment</i>			
	Primary (1)	Middle (2)	Basic (3)	Technical (4)
Buddhist male literacy (count)	0.1869	0.4142	0.2587	0.9135
<i>SE</i>	(0.3244)	(0.3838)	(0.3332)	(0.3305)
Bonferroni CI	[-0.5047, 0.8785]	[-0.4041, 1.2325]	[-0.4517, 0.9691]	[0.2089, 1.6181]
Riots since 1901 (count)	-0.2823	-0.5036	-0.3598	-0.2421
<i>SE</i>	((0.1942)	(0.171)	(0.1781)	(0.1674)
Bonferroni CI	[-0.6963, 0.1317]	[-0.8682, -0.139]	[-0.7395, 0.0199]	[-0.599, 0.1148]
Buddhist male literacy × Riots since 1901	0.366	0.637	0.4619	-0.0173
<i>SE</i>	(0.1003)	(0.1802)	(0.1165)	(0.1046)
Bonferroni CI	[0.1522, 0.5798]	[0.2528, 1.0212]	[0.2135, 0.7103]	[-0.2403, 0.2057]
Obs.	573	570	570	412
Adjusted R^2	0.783	0.7902	0.8174	0.6099
District FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table 2: Standardized two-way fixed effects estimates with various education outcomes for females as dependent variables. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

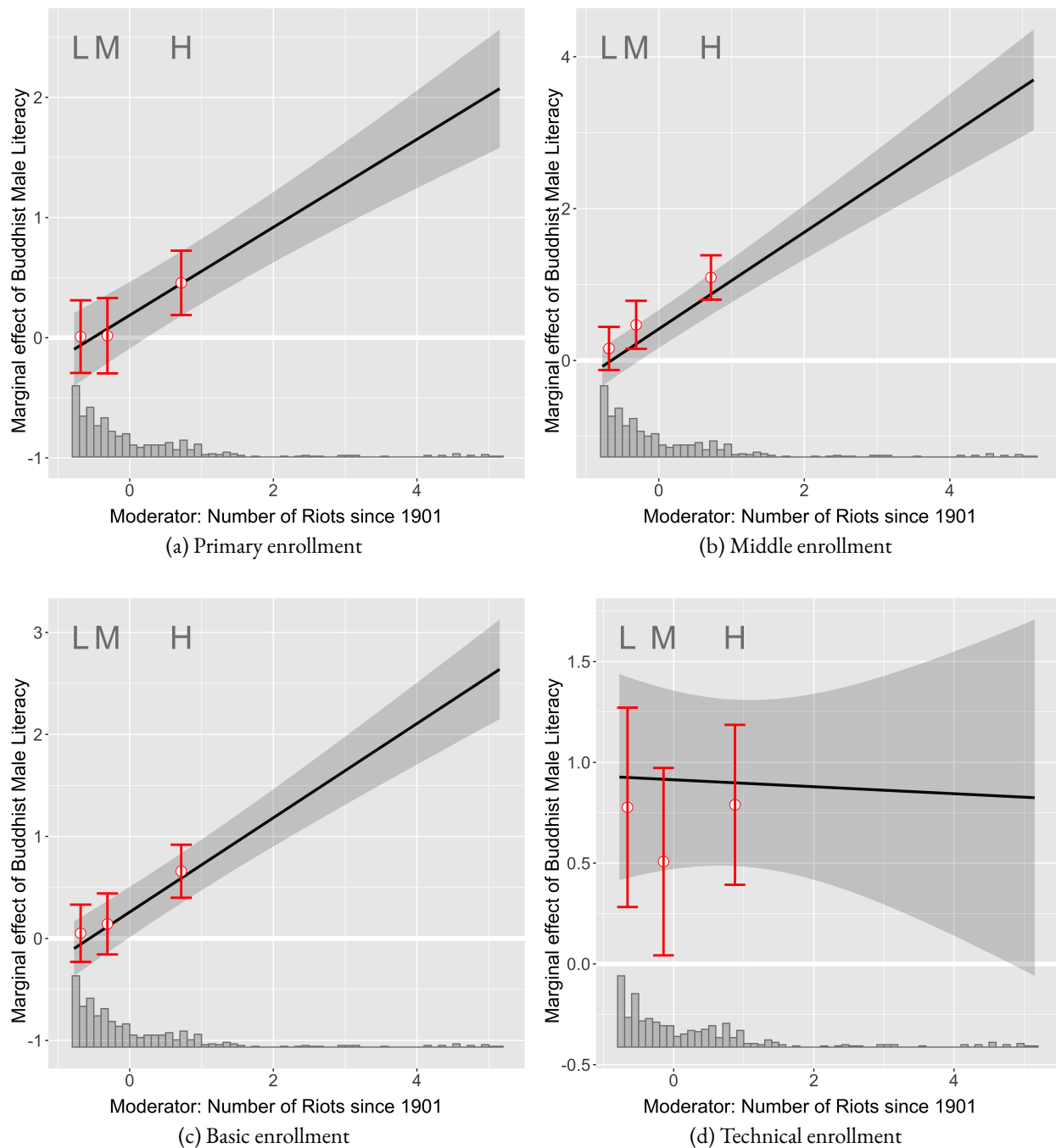


Figure 5: Marginal effects plot of Buddhist male literacy coefficient estimates for various female enrollment outcomes. Standardized two-way fixed effects coefficients. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

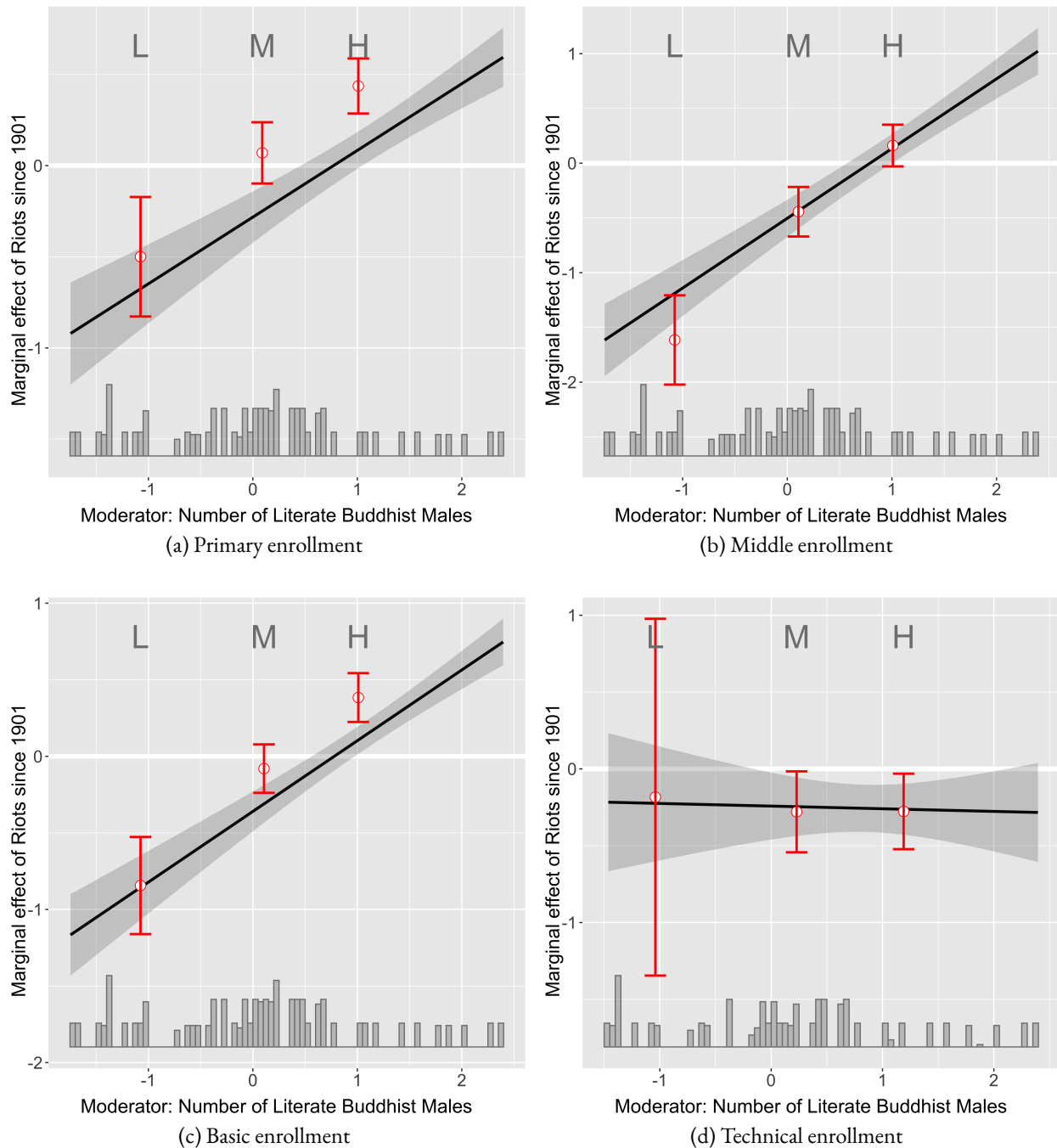


Figure 6: Marginal effects plot of Buddhist male literacy coefficient estimates for various female enrollment outcomes. Standardized two-way fixed effects coefficients. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

5.2.2 Overall Education Outcomes

Table 3 shows the OLS results for the first set of measured variables, including both genders, based on Equation (1). Note that we cannot independently interpret the coefficients since they represent conditional relationships. The first column represents the resulting involvement at the school level: recorded number of basic schools, which is the sum of primary and middle schools. Second through fifth columns represent resulting involvement at the student level: enrollment for both genders in primary, middle, basic, and technical schools. All values are standardized for easier interpretability. Standard errors are clustered by districts. Because we are concurrently producing estimates for five different dependent variables, I use Bonferroni correction for multiple hypotheses testing, additionally adjusting the standard errors and confidence intervals at more conservative thresholds to reduce false discovery rates. In this case, I estimate and test four hypotheses at 95 percent confidence, which leads to the Bonferroni-corrected threshold of 98.75 percent confidence ($\alpha = 0.05/4 = 0.0125$).

First, the coefficient estimates for Buddhist male literacy is consistently positive across all variables except middle school enrollment. In terms of inference, all the confidence intervals contain the null estimate. In contrast, interaction coefficient estimates are consistently positive across all variables, with sizes ranging from 0.0063 (technical enrollment) to 0.5119 (middle enrollment). In other words, one standard deviation in the number of riots since 1901 increases the positive correlation between Buddhist male literacy and colonial school enrollment as much as more half a standard deviation.

In terms of inference, the estimated coefficients show that two intervals (middle enrollment and basic enrollment) at 98.75 percent confidence do not contain the null estimate. Altogether, they provide some support the theoretical prediction that anti-colonial resistance conditions the relationship between indigenous education level and colonial involvement, increasing colonial educational investments in the places with a strong presence of indigenous providers (Hypothesis 3). However, to estimate the how Buddhist male literacy and cumulative riots change each other in their relationship with colonial education, we will move on to observing the marginal effects.

	<i>DV: Total enrollment</i>			
	Primary (1)	Middle (2)	Basic (3)	Technical (4)
Buddhist male literacy (count)	0.1145	0.3207	0.1793	0.8082
<i>SE</i>	(0.3519)	(0.3928)	(0.334)	(0.7701)
Bonferroni CI	[-0.6358, 0.8648]	[-0.5167, 1.1581]	[-0.5328, 0.8914]	[-0.8337, 2.4501]
Riots since 1901 (count)	-0.154	-0.2758	-0.2016	-0.1007
<i>SE</i>	(0.1542)	(0.1988)	(0.1365)	(0.2423)
Bonferroni CI	[-0.4828, 0.1748]	[-0.6996, 0.148]	[-0.4926, 0.0894]	[-0.6173, 0.4159]
Buddhist male literacy × Riots since 1901	0.2489	0.5119	0.349	0.0063
<i>SE</i>	(0.1203)	(0.2062)	(0.1363)	(0.1285)
Bonferroni CI	[-0.0076, 0.5054]	[0.0723, 0.9515]	[0.0584, 0.6396]	[-0.2677, 0.2803]
Obs.	573	570	570	412
Adjusted R^2	0.783	0.7902	0.8174	0.6099
District FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table 3: Standardized two-way fixed effects estimates with various education outcomes as dependent variables. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

To see if this positive interaction substantially changes the relationship between indigenous education and colonial involvement, I create marginal effects plots for each variable (Figure 7). As the cumulative riots increases from sample minimum to sample maximum, it switches the linear marginal effects of Buddhist male literacy from negative to positive for primary (-0.05 to 1.48), middle (-0.70 to 2.47), and basic enrollment (-0.27 to 1.89). This switch aligns with the expected role of anti-colonial resistance moderating the relationship between Buddhist male literacy and colonial involvement in education (Hypothesis 1). In terms of inference, however, confidence intervals for the marginal effect is contain the null estimate at the low end of cumulative riots for primary and basic enrollment.

The binned estimates also provide support for the hypothesis. For primary and basic enrollment, all but one with the highest quartile of cumulative riots contain the null estimates in their confidence

intervals. For middle enrollment, all but the highest quartile have negative estimates throughout their confidence intervals.

How does indigenous literacy conditions the relationship between anti-colonial resistance and colonial educational involvement? Marginal effects plots show that this relationship observes a similar switch (Figure 8). As Buddhist male literacy increases from sample minimum to sample maximum, marginal effects of cumulative riots switch from negative to positive for primary (-0.73 to 0.47), middle (-1.44 to 1.07), and basic enrollment (-1.01 to 0.7). In terms of binned estimates, the lowest quartile intervals are strictly negative for all outcomes, while highest quartile intervals are strictly positive for primary and basic enrollment. Overall, the results here suggest that anti-colonial resistance substantially changed the relationship between indigenous and colonial education providers, as the latter switched from limited to expanded involvement with rising resistance.

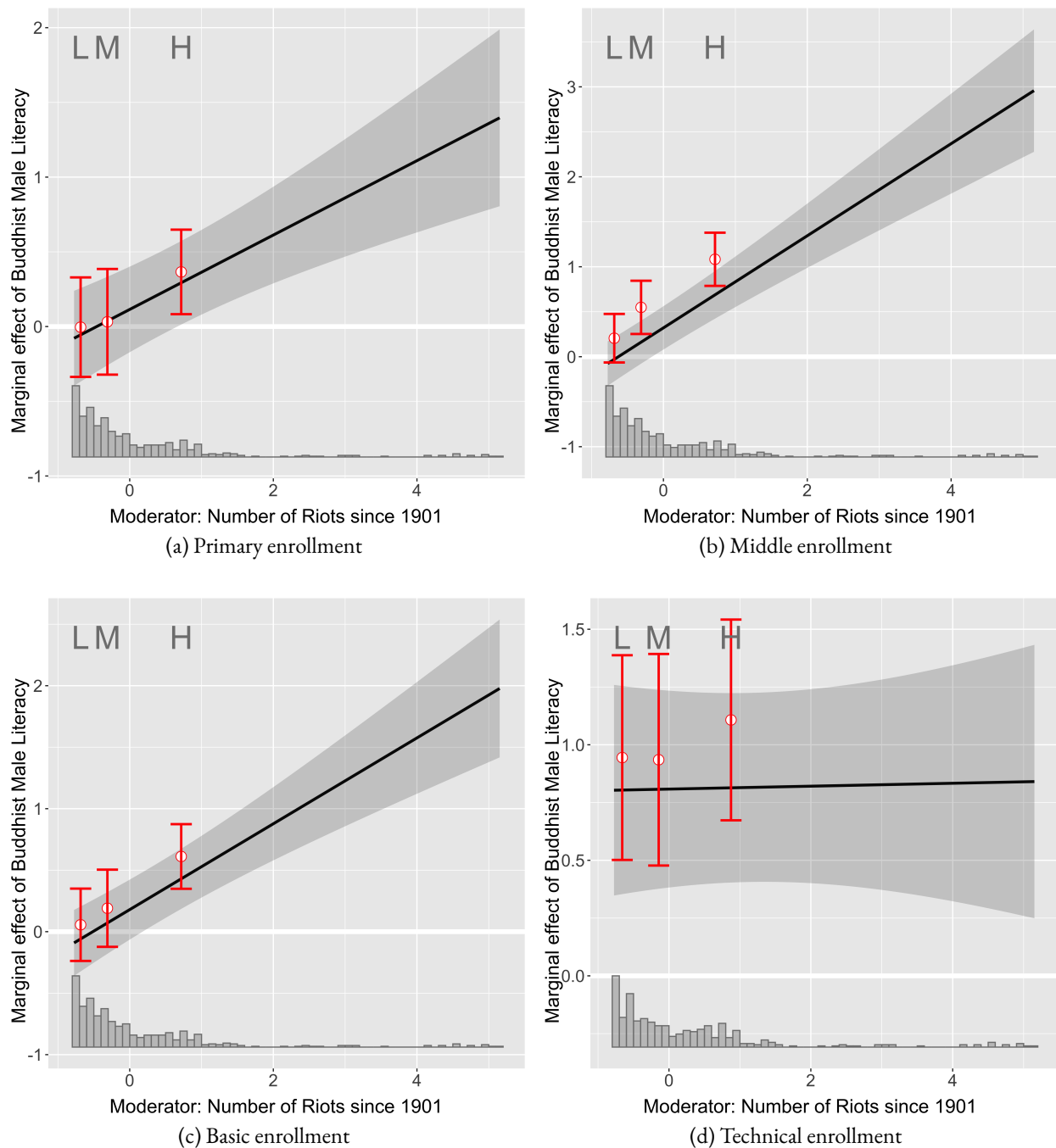


Figure 7: Marginal effects plot of various education outcomes. Standardized two-way fixed effects coefficients. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

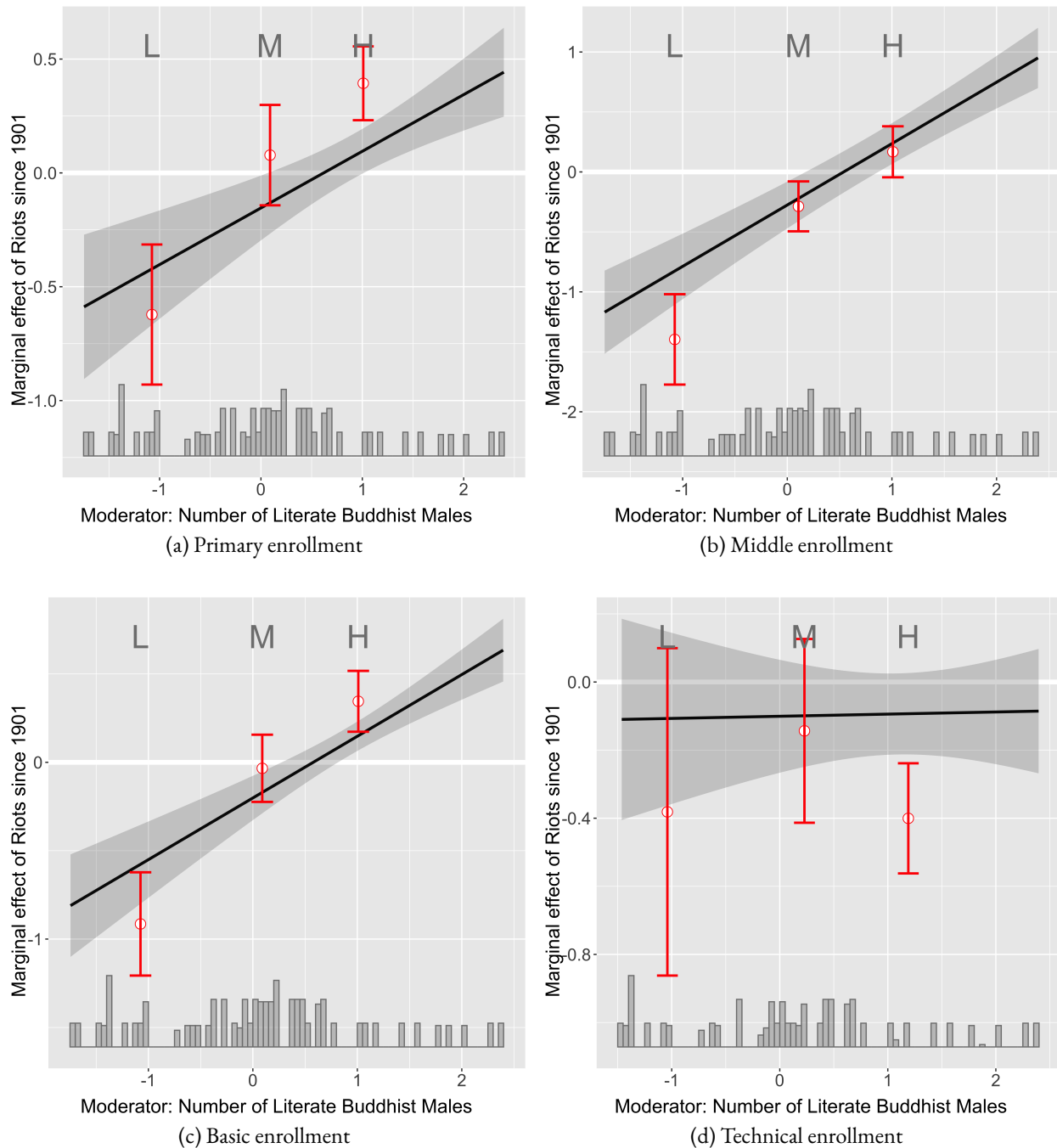


Figure 8: Marginal effects plot of various education outcomes. Standardized two-way fixed effects coefficients. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

6 Alternative Explanations

6.1 Factor Endowment as Confounder

A potential confounder affecting indigenous education levels, anti-colonial resistance, and colonial education outcomes is factor endowment. The relationship between factor endowments and colonial state-building process a long-running discussion among the studies on colonial Latin America (Acemoglu, Garcia-Jimeno, and Robinson 2012; Dell 2010; Engerman and Sokoloff 2002, 2012). In terms of its impact on education, recent studies argued that factor endowments, such as historical trade networks and economic geography, played a critical role in shaping educational development in West Africa. (Huillery 2009; Ricart-Huguet 2020). If this is the case, our earlier inference could be affected by the systematically different levels of indigenous education, anti-colonial resistance, and colonial education outcomes between high-endowment places and low-endowment places.

To address this concern, I create the coefficient estimates with two measures of factor endowment: area under rice cultivation and areas covered by forests. Both co-respond to the prime export products of the colonial state: rice and teak. I then include the two measures as controls for the estimates using different female enrollments as dependent variables.

Estimated coefficients are generally similar to those without the controls (Table 4). For the coefficients of Buddhist male literacy, sizes range from -0.198 (technical enrollments) to 0.3637 (middle enrollment). Only primary and technical enrollments have 98.75 percent confidence intervals without the null estimate.

I do not observe substantial changes in interaction coefficient estimates. They are all consistently positive, and sizes range from 0.3456 in primary enrollments to 0.5574 in middle enrollments (Figure ??). Similar to earlier results, this means that one standard deviation in cumulative riots is associated with a one-third standard deviation decrease in the relationship between Buddhist male literacy and primary enrollments and a half decrease for middle enrollments. Therefore, controlling for factor endowments does not significantly affect the evidence from preceding results.

	Dependent Variable: enrollment			
	Primary	Middle	Basic	Technical
Buddhist male literacy (Count) <i>SE</i>	-0.4348 (0.1052)	0.3042 (0.1217)	-0.2586 (0.1025)	-0.2532 (0.1777)
Riots since 1901 (Count) <i>SE</i>	-0.235 (0.0845)	-0.6611 (0.098)	-0.3683 (0.0826)	-0.1307 (0.1548)
Buddhist male literacy × Riots since 1901 <i>SE</i>	0.2559 (0.0504)	0.5148 (0.0585)	0.3423 (0.0493)	-0.0125 (0.0946)
District FE	✓	✓	✓	✓
Time FE	✓	✓	✓	✓
No. of Obs.	593	589	589	382
Adjusted R^2	0.8065	0.7549	0.8181	0.6235

Table 4: Standardized two-way fixed effects estimates with various female enrollment outcomes as dependent variables. Areas under rice cultivation and areas covered by forests are included as controls. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

6.2 The Role of Christian Missionaries

Missionaries often appear in the accounts of colonial education as the pivotal actors spreading education across the colonized territories. The bulk of discussions on colonial educational development was centered around the role of missionaries (Ananyev and Poyker 2021; Bolt and Bezemer 2009; Bouche 1991). This was also especially the case in British India, under which Burma was a province until 1937. Lankina and Getachew, for example, showed how earlier colonial missionary activity influenced human capital development in Indian states even after independence from British rule. (Lankina and Getachew 2012). Similarly, complementing this, missionary-driven educational investments affected the long-run development as far as 1971, a few years after the Indian government instituted the National Education Policy. (Chaudhary 2009).

To observe the role of Christian missionaries in British Burma and whether we will see similar results with indigenous education, I use the census data and include Christian population as a variable, along with its interaction, while using female enrollment as dependent variables (Table 5). In contrast with Buddhist male literacy, estimated coefficients are positive across all enrollments, with sizes ranging from 0.5468 (middle enrollments) to 0.7556 (primary enrollments). All of their 98.75 percent confidence intervals do not contain the null estimate except for technical education. We may interpret this as Christian literacy indicative of colonial involvement, with its values increasing as state involvement increases.

Contrary to the predictions for indigenous education, the interaction coefficients are consistently negative across enrollments. No null estimates are in the confidence intervals for primary enrollments and basic enrollments altogether (Figure ??). They each suggest that one standard deviation increase in cumulative riots decreases the association between Christian literacy and female enrollments by around one-fifth standard deviation. The lack of enrollment increases driven by Christian literacy in high-riot districts coincide with the fact that colonial involvement was mainly through the establishment of Buddhist layperson schools instead of missionary schools. Overall, the results suggest that theoretical predictions for indigenous education do not apply to the relationship between Christian literacy and state involvement.

	Dependent Variable: enrollment			
	Primary	Middle	Basic	Technical
Christian literacy (Count) <i>SE</i>	0.7556 (0.1194)	0.5468 (0.138)	0.7382 (0.1137)	-0.0685 (0.1595)
Riots since 1901 (Count) <i>SE</i>	-0.0378 (0.081)	-0.2512 (0.0931)	-0.0992 (0.0767)	-0.1877 (0.1054)
Christian literacy × Riots since 1901 <i>SE</i>	-0.2745 (0.0525)	-0.0797 (0.0605)	-0.2356 (0.0498)	-0.0984 (0.0669)
District FE	✓	✓	✓	✓
Time FE	✓	✓	✓	✓
No. of Obs.	428	424	424	338
Adjusted R^2	0.7919	0.7395	0.8157	0.6048

Table 5: Standardized two-way fixed effects estimates with various female enrollment outcomes as dependent variables, and Christian literacy as a measure of non-indigenous education. enrollment outcomes are for both genders. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

7 Conclusion

Why do states decide to involve in educating the society within their territories? In this paper, I re-frame the question by investigating the form of such involvement: why do states limit their involvement and cooperate with existing non-state providers in some instances but expand their involvement and replace or increase control over the existing providers. Findings from the novel dataset of British Burma districts between 1901 and 1920 show that societal resistance conditions the decision. When local resistance to the state is low, as measured by the cumulative number of riots and unlawful assemblies since 1901, colonial education outcomes are negatively correlated with indigenous education levels, as the state worked with existing non-state providers to achieve economic benefits at low fiscal costs. When resistance is high, however, the state attempts to replace indigenous providers with a system of its own.

While the historical and empirical findings come from British Burma, their implications have the potential for cross-sectional comparison across other colonial states with substantial indigenous-led ed-

ucation systems. For example, in 1919, right after a major anti-colonial uprising in Tonkin, the French colonial government introduced a series of education regulations (*Règlement Général de l'Instruction Publique en Indochine*), which centralized the colonial education system, introduced French as a language requirement, and effectively abolished the indigenous schools of character (Hoa 2009, 2013; Xuan 2018; Vu 2012). Similarly, the colonial government in Dutch East Indies (present-day Indonesia) pursued an expansionary education policy with the construction of village schools; within eight years from 1910 to 1918, the total number of village schools grew four-fold (from 1,161 to 4,473) in Java and Madura, and two-fold (from 525 to 1,142) in Outer Islands (Penders et al. 1968). Future research can evaluate this paper's implications in these diverse case contexts.

It remains to see whether the theory and findings here are applicable to the historical development of mass education in Europe, where historical accounts have already mentioned the gradual replacement of church-led education systems with state-provided mass education systems. Weber (1976), for example, described the process of how traditional schools in France across different regions gradually came under standardized control of the French state, along with compulsory education laws, teacher training, and curriculum content. Similarly, using unique data on school censuses in 1865, Cvreck and Zajicek detailed how the Austrian Empire gradually pursued school reforms with support from landowners despite opposition from the Catholic Church.(Cvrcek and Zajicek 2019). Future research can investigate these patterns and understand the historical interactions between the state and societal organizations and their role in shaping the systems of mass education as we know them today.

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Appendix: The Societal Origins of State Education

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1 Formalization of Argument

1.1 Game Setup

The game Γ captures the strategic interaction between two actors, Government, G , and Indigenous Society, I , over two periods, $t = 0, 1$. In the first period, the government can choose to spend its fiscal resources on one of the following three choices: sole involvement in coercion P , limited involvement in indigenous education L , and expanded involvement by replacing indigenous education S . In the second period, the state faces a probabilistic negative shock, and if there was a negative shock, the indigenous society can choose to rebel against the government or not. The discount rates δ are set at 1 for both actors for simplicity. The purpose of the model is to capture the decision-making process of the colonial governments over different aspects of state building process while facing political and economic instabilities.

In the first period, there incurs a cost on the government depending on its choice over the three options. First, the government can invest in physical coercion at the cost of 0. Set for simplicity, this also assumes physical coercion as the least expensive form of involvement. Second, it can make limited involvement in education by funding indigenous schools at a cost of $-\Delta(e)$, a convex function that decreases with the level of education e such that $-\Delta'(e) > 0$ $-\Delta''(e) < 0$. The level of education of the society is the sum of years of schooling for all the individuals, $e \in [0, \infty)$. Third, it can invest in the expanded education system, which results in the same cost as investing in indigenous education when the level of education is 0 such that $-\Delta = -\Delta(0)$.

The indigenous society's first-period payoff depends on if the colonial government invested in coercion or not. If there was an investment in physical coercion, the society accrued a level of grievance $-g$ such that $g \in [0, \infty)$. If there was either limited or expanded involvement, the society receives a status-quo payoff 0.

The second period starts off with the Nature N assigns the economy a negative shock

with probability λ . If there is no negative shock, the government and the society receive the status-quo payoffs of V_G and V_I respectively such that $V_G, V_I > 0$. If there is a negative economic shock, the society can choose to resist against the government R or not $\neg R$, the latter of which results in status-quo payoffs. After choosing to resist, it mobilizes at a cost that is a function of the society's level of education, $-m(e)$, if there was no expanded involvement in education in the first period. This mobilization cost is a convex function that decreases with the level of education such that, $-m'(e) > 0$ and $-m''(e) < 0$. However, if the government invested in education in the first period, the level of education increased from e to $e' > e$, and only a portion of the new level of education is available for mobilization against the government such that $-m(\gamma_L e')$ after limited involvement and $-m(\gamma_S e')$ after expanded involvement. $\gamma_L \in [0, 1]$ and $\gamma_S \in [0, 1]$ therefore represents the extent to which the government was able to "demobilize" the indigenous society by investing in education. I also additionally assume that the extent of such demobilization is stronger after expanded involvement than limited involvement, such that $\gamma_L > \gamma_S$.

If the society chooses to resist, the two actors are engaged in a conflict that results in government winning with a probability that is dependent on its coercive resources. If there is no investment in coercion, the government wins the conflict with probability $\alpha(c)$ and loses with $1 - \alpha(c)$, where c is the level of coercive resources such that $c \in [0, \infty)$. $\alpha(c)$ is a convex function that increases with c such that $\alpha'(c) > 0$ and $\alpha''(c) < 0$. However, if there was an investment in coercion, the probability increases to $\alpha(c') > \alpha(c)$. If the government wins, both actors receives the status-quo payoffs of V_G and V_I . However, if the society wins, the payoffs are $V'_G < V_G$ for the government and $V'_I > V_I$ for the society.

In summary, in the first period, the government makes a decision over three possible types of investment: coercion P , indigenous education L , and expanded education S . Each of this decision affects the level of education e , associated costs, and the extent to which the society can mobilize against the government based on the level of education and the government control over education, γ_L and γ_S . The level of education and the investment

in coercion in turn affects the cost of mobilization if the society chooses to resist m , and the winning probability of the government during a conflict α , respectively. Figure 1 also provides a visualization of the game setup.

The timing of the game is as follows:

1. The parameter values for $c, e, g, \lambda, V_I, V_G, \gamma_L$, and γ_S are given. The values for c', e', V_I' , and V_G' are assigned based on the specified conditions. The functional forms for $\alpha(c)$, $\Delta(e)$, and $m(e)$ are specified.
2. Period 1 starts with the government G choosing one of the three possible actions: investment in physical coercion P , investment in education by funding indigenous schools L , and investment in education by expanding the expanded education system S . Utility values for the government G and the indigenous society I are realized.
3. Period 2 starts with the nature N choosing a negative shock against the state with a probability λ . If there was no shock, the game ends with payoffs realized for the two actors.
4. If there was a negative shock, I chooses between two actions: resist against the state R and not resist against the state $\neg R$. Payoffs are realized for the two actors. The game ends.

1.2 Theoretical Assumptions

The purpose of the model is to explicitly map the link between education investment and political stability, and under what conditions non-democratic states will choose education over investing solely in physical coercion during periods of political instability. This is different from existing theories of goods provision under non-democratic states, which focus either on factor endowment and information collection. In the context of colonial regimes in Sub-Saharan Africa, Ricart-Huguet (2020) emphasize local economic geography as a key

driver of colonial education investments. While acknowledging the specific channels through which the increase in goods provision occurred, this paper focuses on the channel where the logic of goods provision is driven by political instability and a possible alternative of a sole focus on coercion or no investment.

Previous research has already shown that authoritarian states do invest in education, or that there is some relationship between education and violent conflict. For example, Paglayan found in the case of Chile after the rebellion of 1859 that provinces that rebelled against the state tended to have larger investments in education. Similarly, Aghion et al (2018), for example, argue that military rivalry was an important factor for education expansion, and authoritarian states, in fact, had higher levels of such expansion, along with a formal model explaining their logic. This paper, however, improves upon the existing knowledge by providing a formal model that focuses on a domestic explanation for the relationship between conflict and education, along with the conditions under which education may become a preferable investment over physical coercion.

In addition, the model assumes that government's decision problem between the three possible action is not convex; the government cannot focus on education investment and coercive investment at the same time. I argue this is a plausible assumption in the cases of colonial states and post-revolution states because serious fiscal constraints imply that allocation to education investment essentially comes at the expense of coercive investment (see Frankema (2011) and Frankema and Van Waijenburg (2014) for the details of fiscal constraints faced by colonial states). In addition, we assume that there exists a baseline level of investment in physical coercion, captured by the government's non-zero probability of winning during the war state ($\alpha(c') > \alpha(c)$). Therefore, the government's choice, in fact, is where to make an additional investment between physical coercion and education at a given level of coercive infrastructure.

What constitutes the negative shock to the economy is intentionally abstract in the game. This is to provide a generalized game that represent the numerous types of negative

shocks that affected colonial states, such as economic depressions, the World Wars, disease outbreaks, or even rebellions led by charismatic personalities. Size of the shock is abstract as well, which limits the game's ability to analyze its relationship with the actors' equilibrium strategies.

Limits of the current game will be mentioned here. While the purpose of the model is to explain why colonial states may or may not invest in education, the framework may apply to the goods other than coercion that potentially serves as a social control, or in non-colonial authoritarian states. For example, land distribution programs in East Asia and Latin America can be another example where goods provision may potentially maintain peace and serve as an alternative to physical coercion (Albertus and Menaldo 2014; Doner, Ritchie, and Slater 2005).

1.3 Equilibrium

I use Subgame Perfect Nash Equilibrium (SPNE) as the solution concept and identify the equilibria using backward induction. Each SPNE is a strategy profiles of the two actors $\sigma = (\sigma_I, \sigma_G)$ that constitutes a Nash equilibrium in every subgame of Γ . In the first period, the government decides between three possible actions (physical coercion, indigenous education, and expanded education) the one that maximizes the two-period payoffs, whose functional forms depend on whether the society has the incentive to resist if there is a negative shock to an economy. In the second period, based on what the government invested in the first period, the society chooses between resisting against the government and not resisting.

The society's utility function in the first period depends on the government's action in the first period (a_G^1), as in following:

$$U_I^1 = \begin{cases} -g & \text{if } a_G^1 = P \\ 0 & \text{if } a_G^1 = L \\ 0 & \text{if } a_G^1 = S \end{cases}$$

The values of the function imply the assumption that the society assigns a negative value on only physical coercion, resulting in the payoff $-g$. However, it is relatively indifferent if the government provides funding for indigenous schools or builds directly controlled schools, resulting in the payoffs of 0. The society's expected utility function in the second period is:

$$E[U_I^2] = \begin{cases} V_I & \text{if } a_I^2 = \neg R \\ (1 - \lambda)V_I + \lambda[(1 - \alpha(c'))V_I' + \alpha(c')V_I - m(e) + g] & \text{if } a_I^2 = R \text{ and } a_G^1 = P \\ (1 - \lambda)V_I + \lambda[(1 - \alpha(c))V_I' + \alpha(c)V_I - m(\gamma_L e')] & \text{if } a_I^2 = R \text{ and } a_G^1 = L \\ (1 - \lambda)V_I + \lambda[(1 - \alpha(c))V_I' + \alpha(c)V_I - m(\gamma_S e')] & \text{if } a_I^2 = R \text{ and } a_G^1 = S \end{cases}$$

The values of the utility function depends on the government's investment decision in the first period, and also reflects the strategic trade-offs between the investments. If the government invested in physical coercion, the probability of government winning during a conflict increases; however, accrued grievances, and low costs of mobilization if the pre-existing level of education is high, increasing the society's incentives to fight. If the government invested in limited or expanded education, while the probability of winning during a conflict is lower, the society's willingness to fight is also lower because the grievances are lower and the state investment has already captured a portion of the educated population available for mobilization, thereby increasing the cost.

The government's utility function in the first period is:

$$U_G^1 = \begin{cases} 0 & \text{if } a_G^1 = P \\ -\Delta(e) & \text{if } a_G^1 = L \\ -\Delta & \text{if } a_G^1 = S \end{cases}$$

This function captures the cost associated with each of the investment. One advantage of

physical coercion is it bears the lowest cost. Therefore, all else equal, as in if the society pursues the same action regardless of the investment, the government will prefer to invest in physical coercion than education. Since this setup abstracts away the economic incentives for the government to invest in education, the only incentive for the government to invest in education is to increase the society's incentives for not resisting against the government during the times of negative shocks.

The government's expected payoff in the second period depends on the society's action in the second period (a_I^2), as in following:

$$E[U_G^2] = \begin{cases} V_G & \text{if } a_I^2 = \neg R \\ (1 - \lambda)V_G + \lambda[(1 - \alpha(c'))V'_G + \alpha(c')V_G] & \text{if } a_I^2 = R \text{ and } a_G^1 = P \\ (1 - \lambda)V_G + \lambda[(1 - \alpha(c))V'_G + \alpha(c)V_G] & \text{if } a_I^2 = R \text{ and } a_G^1 = L \\ (1 - \lambda)V_G + \lambda[(1 - \alpha(c))V'_G + \alpha(c)V_G] & \text{if } a_I^2 = R \text{ and } a_G^1 = S \end{cases}$$

This function reiterates the previous point. If there was no negative shock or the society chooses not to fight regardless of the type of investment, the government receives the same payoff regardless of its investment in the first period. Therefore, the government received the highest payoff by investing in coercion in the first period. Similarly, if the society chooses to fight after a negative shock regardless of the investment, the government received the highest payoff by investing in coercion in the first period.

Since the only advantage from investment in education in this game is its ability to prevent the society from resisting against the government, investment in any education requires the government to prefer the riskless payoff from the status quo minus the cost to the risky payoff due to the potential resistance against the government. The following remarks captures this requirement.

Lemma 1 (Cost of Education). The government's equilibrium strategy is to invest in physical coercion P if the cost of education is sufficiently high such that $\Delta(e) > \lambda(1 -$

$\alpha(c'))(V_G - V'_G)$. *Proof:* See Appendix 7.1.

The requirement further implies how different parameters affects the conditions under which the government has the incentive to invest in education and prevent anti-government resistance. First, the probability of a negative shock λ should be sufficiently high enough so that the likelihood at which the government has to face off against the society justifies the cost. Second, the probability of the society winning in a conflict, even after investing in physical coercion, should be high enough so that there is a real risk of being defeated by the society and receiving the lower payoff.

If the above requirement is met, we can ensure that the costs of education are sufficiently low for the government to prefer the investment in education, receiving the payoffs without the risk of resistance, to the investment in coercion, receiving the payoff with the risk of resistance. Now we can determine the conditions under which the society still has the incentive to resist after the government's investment and a negative shock. For the society to prefer resisting over not resisting against the government after a negative shock, the following inequalities must hold:

$$V_I < \begin{cases} (1 - \alpha(c'))V'_I + \alpha(c')V_I - m(e) + g & \text{if } a_G^1 = P \\ (1 - \alpha(c))V'_I + \alpha(c)V_I - m(\gamma_L e') & \text{if } a_G^1 = L \\ (1 - \alpha(c))V'_I + \alpha(c)V_I - m(\gamma_S e') & \text{if } a_G^1 = S \end{cases}$$

Moving around the terms, we get the critical values of mobilization cost at which any larger value will make the society prefer to resist:

$$\begin{aligned} m(e) &< (1 - \alpha(c'))(V'_I - V_I) + g && \text{if } a_G^1 = P \\ m(\gamma_L e') &< (1 - \alpha(c))(V'_I - V_I) && \text{if } a_G^1 = L \\ m(\gamma_S e') &< (1 - \alpha(c))(V'_I - V_I) && \text{if } a_G^1 = S \end{aligned}$$

These conditions show a number of parameters that shapes the society's preference for resisting. First, there is a strategic trade-off between the level of education and the portion of educated and demobilized population after government investment. Higher levels of education reduces the mobilization costs and increases the society's preference to resist, *ceteris paribus*. However, after investment in limited and expanded education, despite the higher levels of education ($e' > e$), the costs can be still high enough to deter resistance because only a portion of the educated population (γ_L for indigenous education and γ_S for expanded education) is available for mobilization. Second, there is a strategic trade-off between the government's winning probability and the level of grievances. While coercion increases the former, the latter increases the society's preference for resistance when given an opportunity.

Given the conditions, I propose four equilibria that describe the government's investment and the society choice over resistance after a negative shock.

Proposition 1 (Peace under Coercion). If $m(e) > (1 - \alpha(c'))(V_I' - V_I) + g$, the following equilibrium forms the unique SPNE of Γ :

1. In period 1, the government chooses P .
2. In period 2, a negative shock occurs at a probability of λ . In the event of a negative shock, the society chooses $\neg R$.

Proof: See Appendix 7.2.

In this equilibrium, the initial level of education is sufficiently low, resistance against the state is unlikely and the government does not need to be concerned with investment in education and instead rely on coercion as the primary focus of state building. An example in British Burma are the Frontier Areas, where the British government was largely absent and limited in its presence to occasional policing. This also largely corresponds to several territories of the colonial state under what Mamdani (1996) inexpaned rule, where the government primarily controlled the territory through "native" institutions, mobilizing coercive forces into the territories when needed.

Proposition 2 (Limited Involvement). If $m(e) > (1 - \alpha(c'))(V_I' - V_I) + g$ and $m(\gamma_S e') > m(\gamma_L e') > (1 - \alpha(c))(V_I' - V_I)$, the following equilibrium forms the unique SPNE of Γ :

1. In period 1, the government chooses L .
2. In period 2, a negative shock occurs at a probability of λ . In the event of a negative shock, the society chooses $\neg R$.

Proof: See Appendix 7.3.

In this equilibrium, the government's coercive capacity does not successfully thwart the risk of resistance when given an opportunity. Therefore, in order to demobilize potential resistance, the government decided to limit its involvement in education to funding. An example of this is the government's initial reliance and funding of Buddhist schools in British Burma. This equilibrium also resembles several cases of colonial education in sub-Saharan Africa, where missionary schools are the government's primary method of education provision.

Proposition 3 (Expanded Involvement). If $m(e) > (1 - \alpha(c'))(V_I' - V_I) + g$ and $m(\gamma_S e') > (1 - \alpha(c))(V_I' - V_I) > m(\gamma_L e')$, the following equilibrium forms the unique SPNE of Γ :

1. In period 1, the government chooses S .
2. In period 2, a negative shock occurs at a probability of λ . In the event of a negative shock, the society chooses $\neg R$.

Proof: See Appendix 7.4.

In this equilibrium, the costs of mobilization are sufficiently low that the society has the incentive to resist both after investment in coercion and limited involvement, meaning that the government can prevent the risk of resistance only by investing in education, which it decides to do so in the first period. An observable difference of this equilibrium from Indigenous Education equilibrium is the development of directly controlled schools, and often outright banning on defunding of indigenous schools. The government's decreasing reliance

on monastic schools in British Burma in the early 20th century resembles this equilibrium, so are the cases of education expansion in Tonkin after 1917 and education reform programs in Dutch East Indies as part of “Ethical Policy.”

Proposition 4 (Coercion without Peace). If $m(e) > (1 - \alpha(c'))(V'_I - V_I) + g$ and $(1 - \alpha(c))(V'_I - V_I) > m(\gamma_S e') > m(\gamma_L e')$, the following equilibrium forms the unique SPNE of Γ :

1. In period 1, the government chooses S .
2. In period 2, a negative shock occurs at a probability of λ . In the event of a negative shock, the society chooses R .

Proof: See Appendix 7.5.

In this equilibrium, the costs of mobilization are sufficiently high such that the society will choose to resist after any type of investment. In this context, the government will choose to invest in coercion since it is the least expensive action and increases the likelihood of winning in a conflict. Descriptive cases of this equilibrium would be waves of anti-colonial conflicts that emerged after the Second World War.

Figure 2 summarizes the aforementioned equilibria, visualizing the government’s expected payoffs as a function of the level of education in the second period, while still holding the assumptions from Remark 1. If the government chooses to invest in coercion while the society’s education level is $e \leq e_1^* = m^{-1}((1 - \alpha(c'))(V'_I - V_I) + g)$, its payoff is the highest (dotted line), since there is no risk of resistance. However, once $e > e_1^* = m^{-1}((1 - \alpha(c'))(V'_I - V_I) + g)$, the risk-free payoff from indigenous education become the highest. Similarly, when $e' > e_2^* = \frac{m^{-1}((1 - \alpha(c))(V'_I - V_I))}{\gamma_L}$, the risk-free payoff from expanded education become the highest. However, when the level of education becomes sufficiently high such that $e' > e_3^* = \frac{m^{-1}((1 - \alpha(c))(V'_I - V_I))}{\gamma_S}$, meaning no type of investment can deter the risk of resistance, the government goes back to repression as an equilibrium strategy.

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1.4 Additional Figures

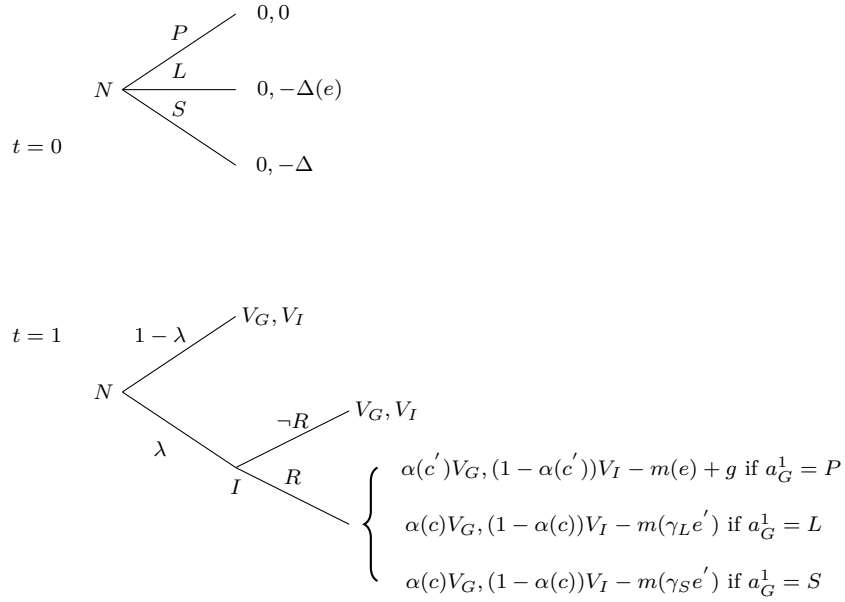


Figure A1: Coercion, Limited Involvement, and Expanded Involvement in a Strategic Interaction

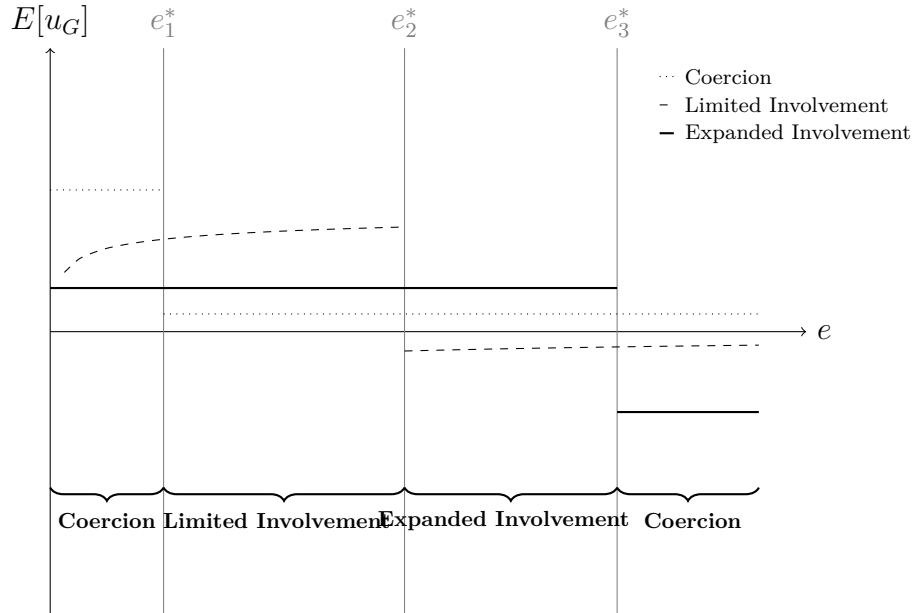


Figure A2: Equilibrium regions based on the relationship between the level of education in the second period e and the expected utility of the government $E[u_G]$. Value assumptions are $e = 1, c = 1, g = 1, V_I = 0, V_I' = 1, V_G = 1, V_G' = 0, \lambda = 0.5$. Function assumptions are $\alpha(c) = 1 - \frac{1}{x+1}, m = \frac{1}{e}, e' = 3e, c' = 3c$.

1.5 Appendix

1.5.1 Proof of Lemma 1

For the government to prefer to choose limited involvement or expanded involvement, it should receive a higher payoff from an equilibrium where it invests in either type of education and the society chooses not to resist in the event of a negative shock, compared to the payoff from an equilibrium where it invests in physical coercion and society chooses to resist in the event of a negative shock. The sum of the two period payoffs are as follows:

$$E[U_G] = U_G^1 + E[U_G^2] = \begin{cases} V_G - \Delta(e) & \text{if } a_G^1 = L \text{ and } a_I^2 = \neg R \\ V_G - \Delta & \text{if } a_G^1 = S \text{ and } a_I^2 = \neg R \\ (1 - \lambda)V_G + \lambda[(1 - \alpha(c'))V'_G + \alpha(c')V_G] & \text{if } a_G^1 = P \text{ and } a_I^2 = R \end{cases}$$

The government will prefer the investment in physical coercion, risking anti-government resistance, to the investment in indigenous education and prevent resistance if the expected payoff from the former is higher than the expected payoff from the latter.

$$\begin{aligned} (1 - \lambda)V_G + \lambda[(1 - \alpha(c'))V'_G + \alpha(c')V_G] &> V_G - \Delta(e) \\ \Delta(e) &> \lambda(1 - \alpha(c'))(V_G - V'_G) \end{aligned} \tag{1}$$

Since $\forall e, \Delta > \Delta(e)$, if $\Delta(e) > \lambda(1 - \alpha(c'))(V_G - V'_G)$, then $\Delta > \lambda(1 - \alpha(c'))(V_G - V'_G)$. QED.

1.5.2 Proof of Proposition 1

If $m(e) > (1 - \alpha(c'))(V'_I - V_I) + g$, then the society's mobilization costs are already sufficiently high after investment in coercion that it chooses to not resist even after a negative shock; that is, its path-of-play equilibrium strategy is $\sigma_I^* = (a_I^2 = \neg R)$; Off-the-path play strategies are indeterminate because I do not make any assumption on the comparison between $m(e)$, $m(\gamma_L e')$, and $m(\gamma_S e')$.

As the result, the government enjoys the sum of the first period payoff of 0 and the second period payoff without risk of resistance V_G . The maximum payoffs after limited involvement are their respective sums of the first-period costs of investment and the second period payoffs without risk of resistance V_G :

$$E[U_G] = U_G^1 + E[U_G^2] = \begin{cases} V_G - \Delta(e) < V_G & \text{if } a_G^1 = L \text{ and } a_I^2 = \neg R \\ V_G - \Delta < V_G & \text{if } a_G^1 = S \text{ and } a_I^2 = \neg R \end{cases}$$

Therefore, the government's equilibrium strategy is to invest in coercion in the first period $\sigma_G^* = (a_G^1 = P)$. QED.

1.5.3 Proof of Proposition 2

If $m(e) < (1 - \alpha(c'))(V_I' - V_I) + g$ and $m(\gamma_S e') > m(\gamma_L e') > (1 - \alpha(c))(V_I' - V_I)$, then the society's mobilization costs are already sufficiently low after investment in coercion to prefer resistance after a negative shock. However, its mobilization costs increases after investing in indigenous education to prefer no resistance; this is also true for expanded education investment since the portion of educated population available for mobilization is lower in expanded education than indigenous education $\gamma_S < \gamma_L$. Therefore, the society's equilibrium strategy is as follows:

$$\sigma_I^* = \begin{cases} R & \text{if } a_G^1 = P \\ \neg R & \text{if } a_G^1 = L \\ \neg R & \text{if } a_G^1 = S \end{cases}$$

If the above is the case, the government strictly prefers indigenous education to expanded education because $\Delta(e) < \Delta$ and the second-period payoffs are the same. Since we assume (1) is false, the government's equilibrium strategy is to invest in indigenous education in the first period $\sigma_G^* = (a_G^1 = L)$. QED.

1.5.4 Proof of Proposition 3

If $m(e) > (1 - \alpha(c'))(V'_I - V_I) + g$ and $m(\gamma_S e') > (1 - \alpha(c))(V'_I - V_I) > m(\gamma_L e')$, then the society's mobilization costs are sufficiently low both after investment in coercion and after investment in location, therefore prefer resistance after either of the investment and a negative shock. However, its mobilization costs increases after investing in indigenous education to prefer no resistance. Therefore, the society's equilibrium strategy is as follows:

$$\sigma_I^* = \begin{cases} R & \text{if } a_G^1 = P \\ R & \text{if } a_G^1 = L \\ \neg R & \text{if } a_G^1 = S \end{cases}$$

If the above is the case, in addition to assuming (1) is false, we have to additionally assume that $\Delta < \lambda(1 - \alpha(c'))(V_G - V'_G)$. If it is true, then the government's equilibrium strategy is to invest in expanded education in the first period $\sigma_G^* = (a_G^1 = S)$. QED.

1.5.5 Proof of Proposition 4

If $m(e) > (1 - \alpha(c'))(V'_I - V_I) + g$ and $(1 - \alpha(c))(V'_I - V_I) > m(\gamma_S e') > m(\gamma_L e')$, it means the society has the incentive to resist after a negative shock, regardless of the type of investment. Therefore, the society's equilibrium strategy is as follows:

$$\sigma_I^* = \begin{cases} R & \text{if } a_G^1 = P \\ R & \text{if } a_G^1 = L \\ R & \text{if } a_G^1 = S \end{cases}$$

In the above is the case, we know that coercion yields the highest expected payoff because the cost is lowest and the second period payoff is the highest due to $\alpha(c') > \alpha(c)$. Therefore, the government's equilibrium strategy is to invest in coercion in the first period $\sigma_G^* = (a_G^1 = P)$. QED.

2 Additional Results

2.1 Only Census Years: All Enrollment

	DV: Total enrollment			
	Primary (1)	Middle (2)	Basic (3)	Technical (4)
Buddhist male literacy (count)	0.7461	-0.2641	0.472	0.9555
<i>SE</i>	(0.5141)	(0.3926)	(0.4708)	(0.6364)
Bonferroni CI	[-0.5597, 2.0519]	[-1.2613, 0.7331]	[-0.7238, 1.6678]	[-0.661, 2.572]
Riots since 1901 (count)	-0.1923	-0.4716	-0.2934	-0.1448
<i>SE</i>	(0.1601)	(0.3255)	(0.1798)	(0.1909)
Bonferroni CI	[-0.599, 0.2144]	[-1.2984, 0.3552]	[-0.7501, 0.1633]	[-0.6297, 0.3401]
Buddhist male literacy × Riots since 1901	0.2319	0.551	0.3482	-0.0238
<i>SE</i>	(0.1504)	(0.2088)	(0.1593)	(0.1372)
Bonferroni CI	[-0.1501, 0.6139]	[0.0206, 1.0814]	[-0.0564, 0.7528]	[-0.3723, 0.3247]
Obs.	86	86	86	62
Adjusted R^2	0.748	0.7438	0.7873	0.5851
District FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table A1: Standardized two-way fixed effects estimates with various education outcomes as dependent variables. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Census years only. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

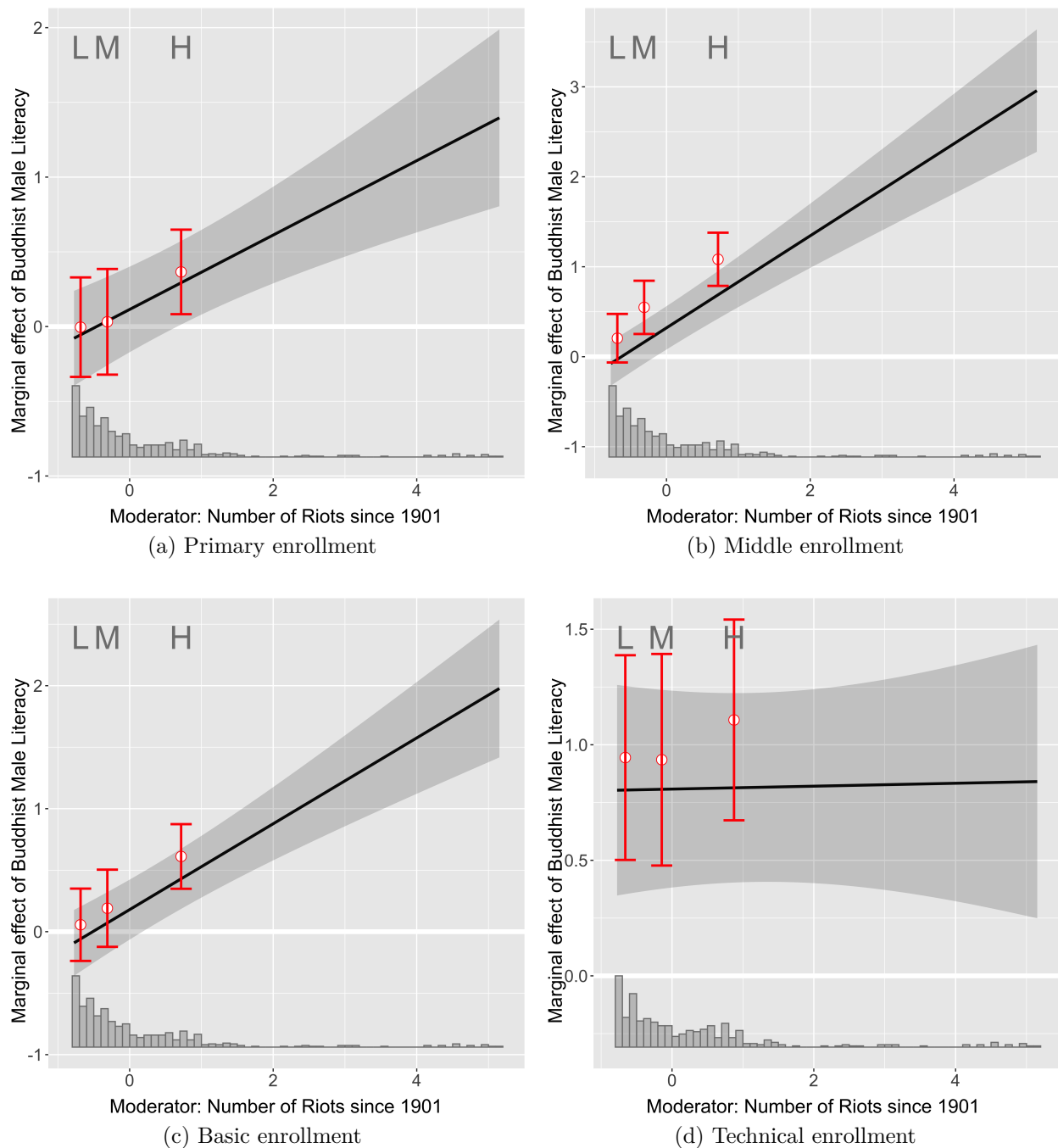


Figure A3: Marginal effects plot of various education outcomes. Standardized two-way fixed effects coefficients. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

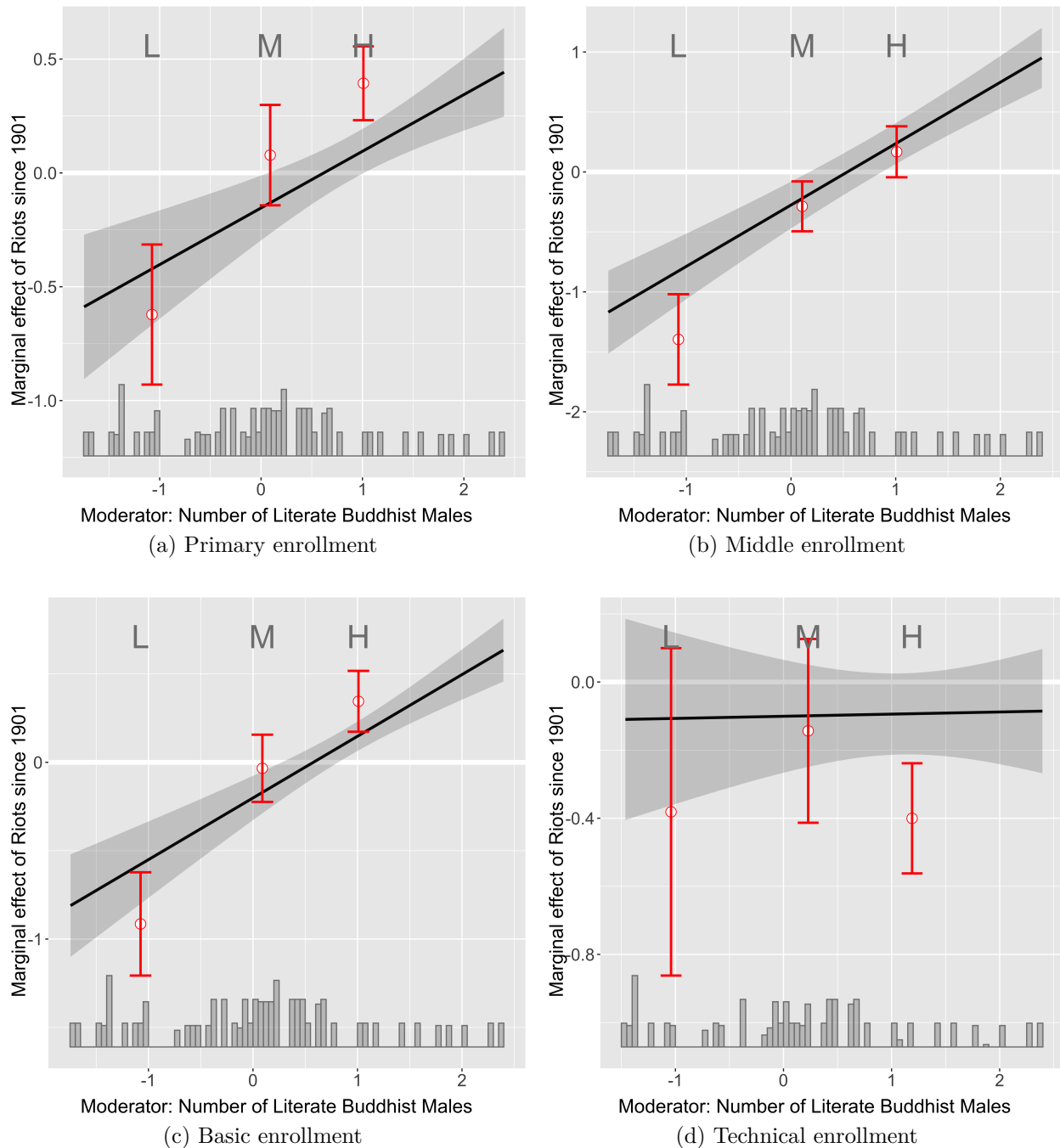


Figure A4: Marginal effects plot of various education outcomes. Standardized two-way fixed effects coefficients. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (five hypotheses).

2.2 Only Census Years: Female Enrollment

	<i>DV: Total enrollment</i>			
	Primary (1)	Middle (2)	Basic (3)	Technical (4)
Buddhist male literacy (count)	0.6043	-0.6046	0.3031	1.3019
<i>SE</i>	(0.6709)	(0.4853)	(0.5866)	(0.7114)
Bonferroni CI	[-1.0998, 2.3084]	[-1.8373, 0.6281]	[-1.1869, 1.7931]	[-0.5051, 3.1089]
Riots since 1901 (count)	-0.2794	-0.6959	-0.4107	-0.5098
<i>SE</i>	(0.1676)	(0.2986)	(0.1728)	(0.3262)
Bonferroni CI	[-0.7051, 0.1463]	[-1.4543, 0.0625]	[-0.8496, 0.0282]	[-1.3383, 0.3187]
Buddhist male literacy × Riots since 1901	0.3008	0.7108	0.4315	0.092
<i>SE</i>	(0.1556)	(0.185)	(0.1472)	(0.219)
Bonferroni CI	[-0.0944, 0.696]	[0.2409, 1.1807]	[0.0576, 0.8054]	[-0.4643, 0.6483]
Obs.	86	86	86	62
Adjusted R^2	0.7172	0.6957	0.771	0.3847
District FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table A2: Standardized two-way fixed effects estimates with various education outcomes for females as dependent variables. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. Census years only. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

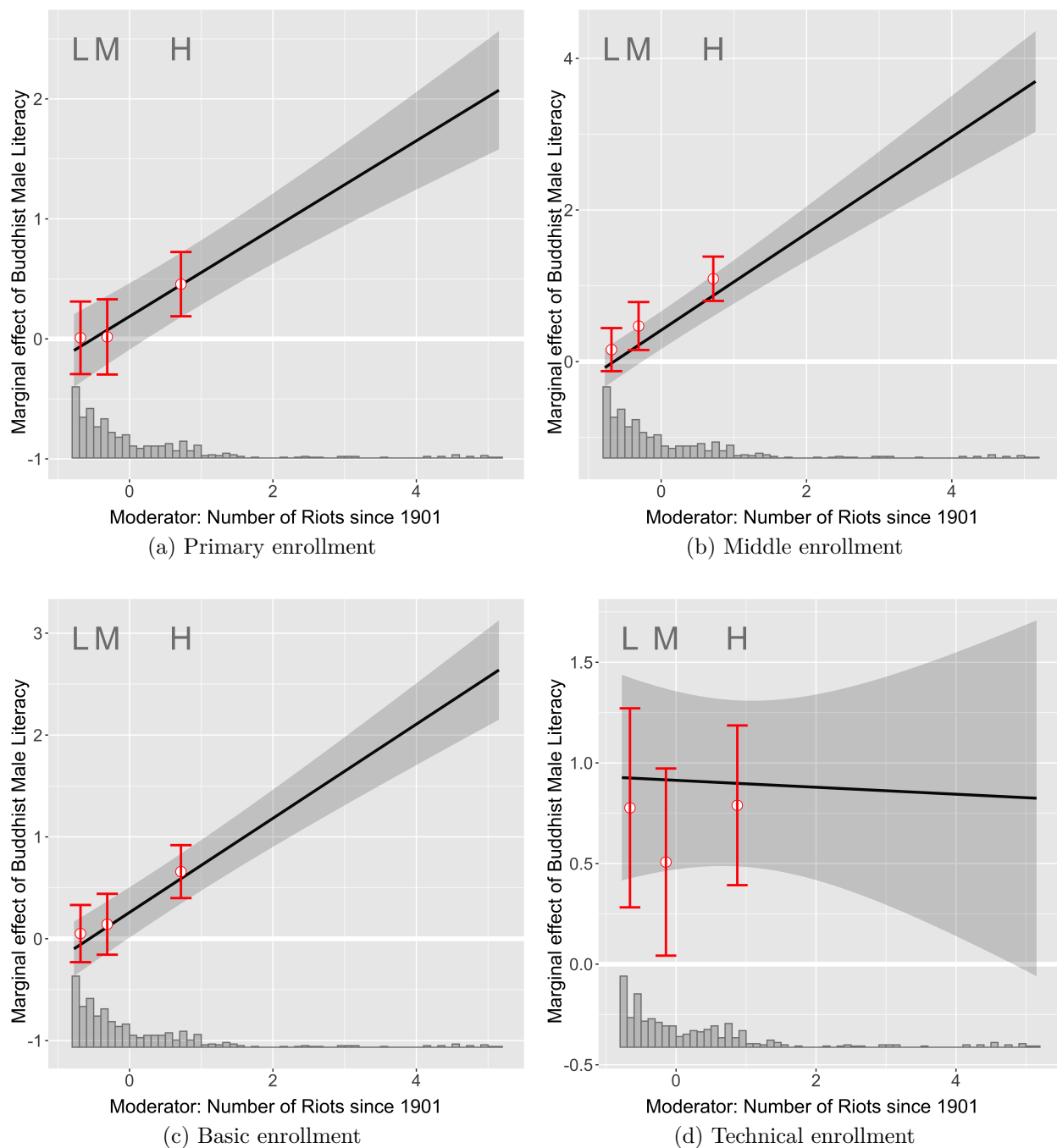


Figure A5: Marginal effects plot of Buddhist male literacy coefficient estimates for various female enrollment outcomes. Standardized two-way fixed effects coefficients. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. Census years only. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

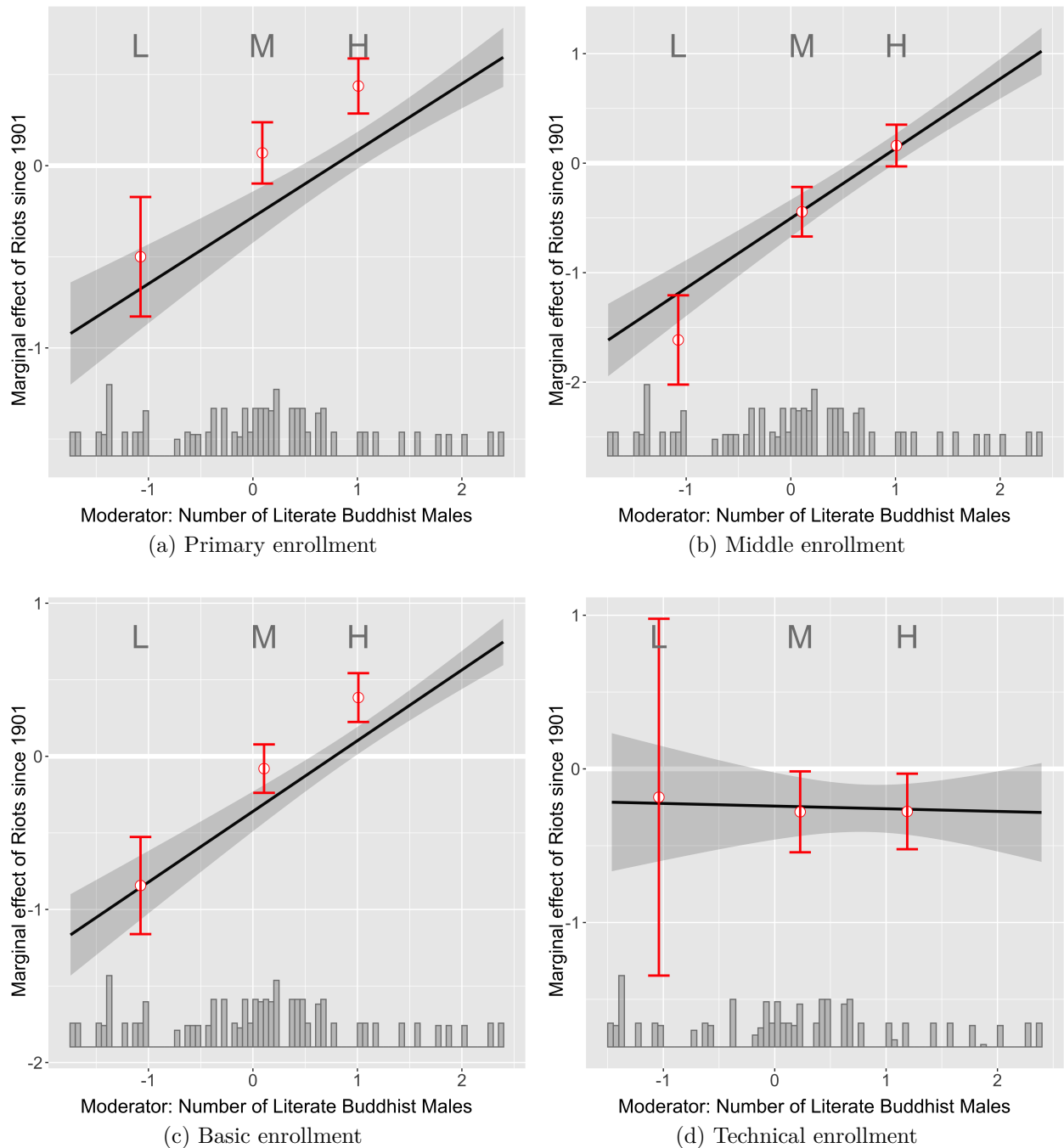


Figure A6: Marginal effects plot of Buddhist male literacy coefficient estimates for various female enrollment outcomes. Standardized two-way fixed effects coefficients. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. Census years only. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

2.3 Lagged Independent Variables: All Enrollment

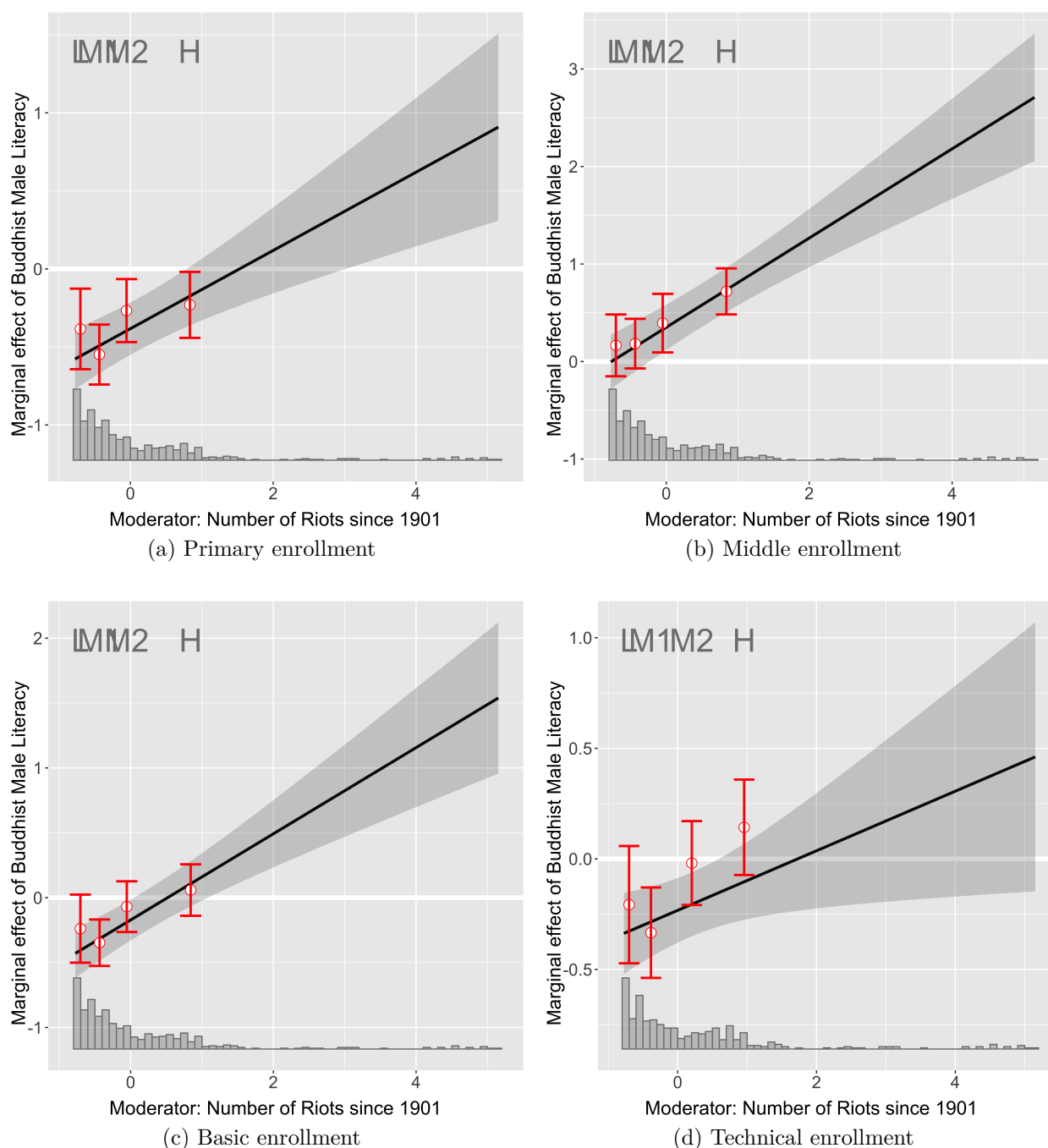


Figure A7: Marginal effects plot of various education outcomes. Standardized two-way fixed effects coefficients. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Lagged values of Buddhist male literacy. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

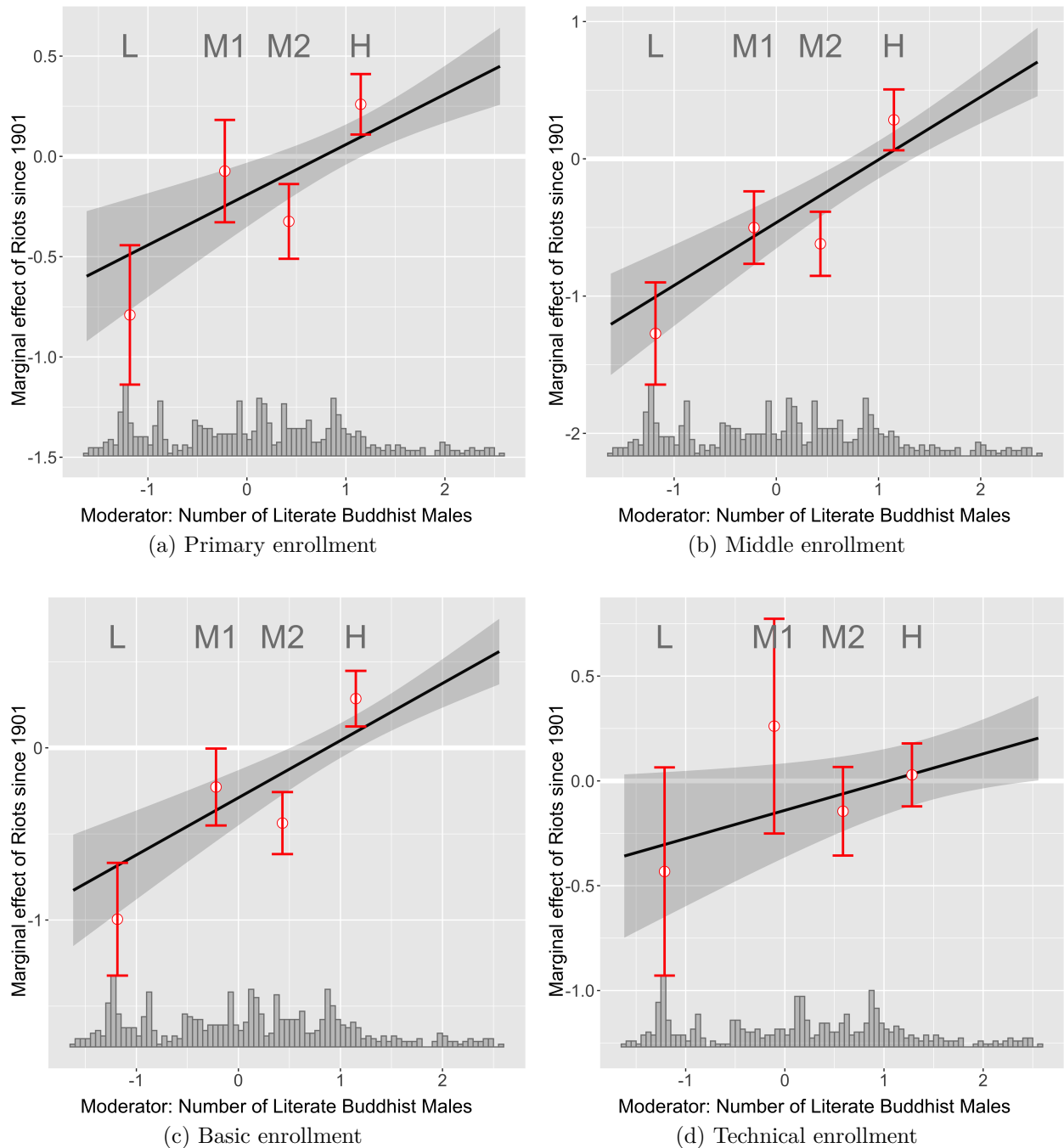


Figure A8: Marginal effects plot of various education outcomes. Standardized two-way fixed effects coefficients. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Lagged values of Buddhist male literacy. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. 98.75 percent CIs result from Bonferroni correction (five hypotheses).

2.4 Lagged Independent Variables: Female Enrollment

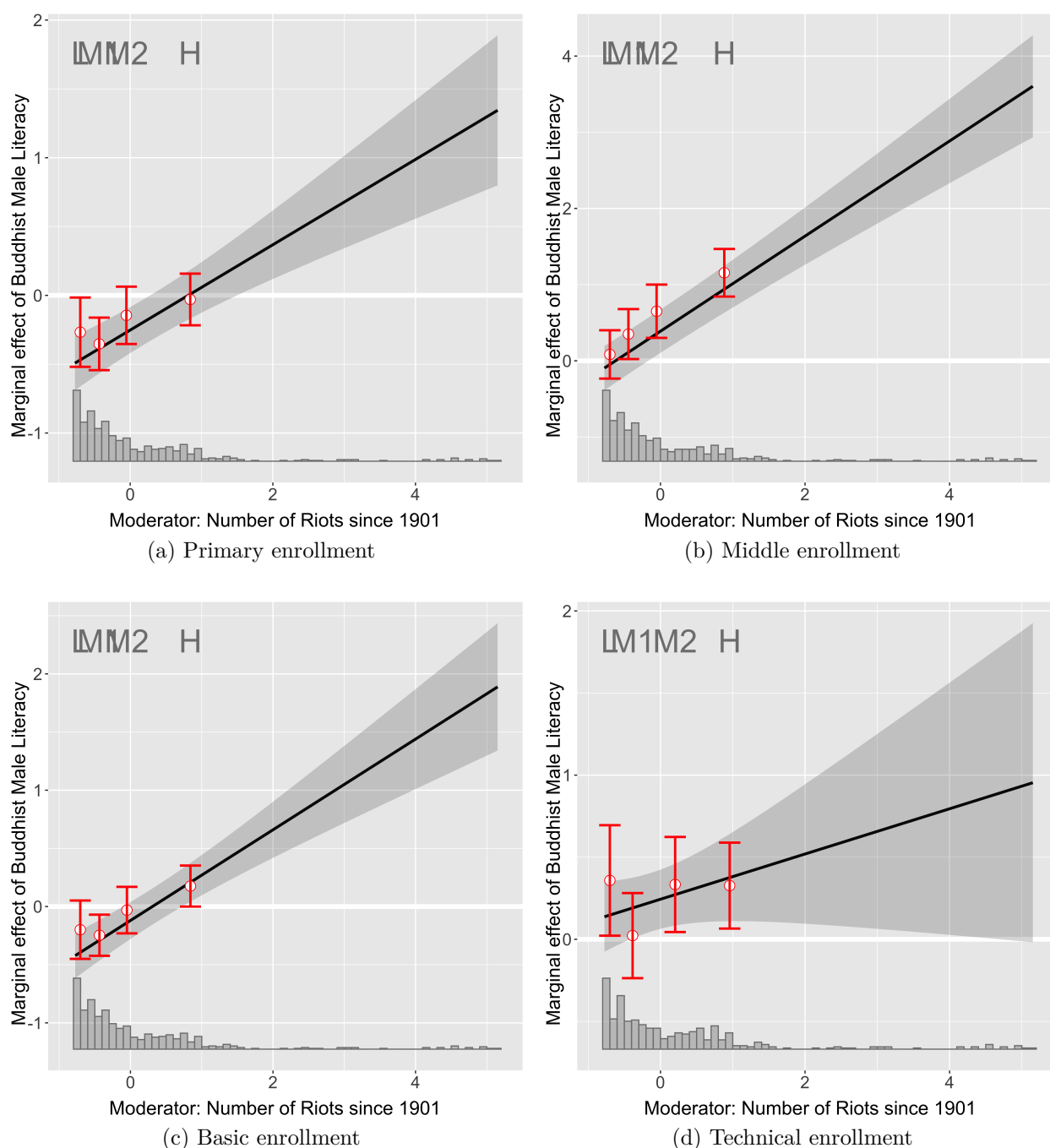


Figure A9: Marginal effects plot of Buddhist male literacy coefficient estimates for various female enrollment outcomes. Standardized two-way fixed effects coefficients. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Lagged values of Buddhist male literacy. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. Census years only. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

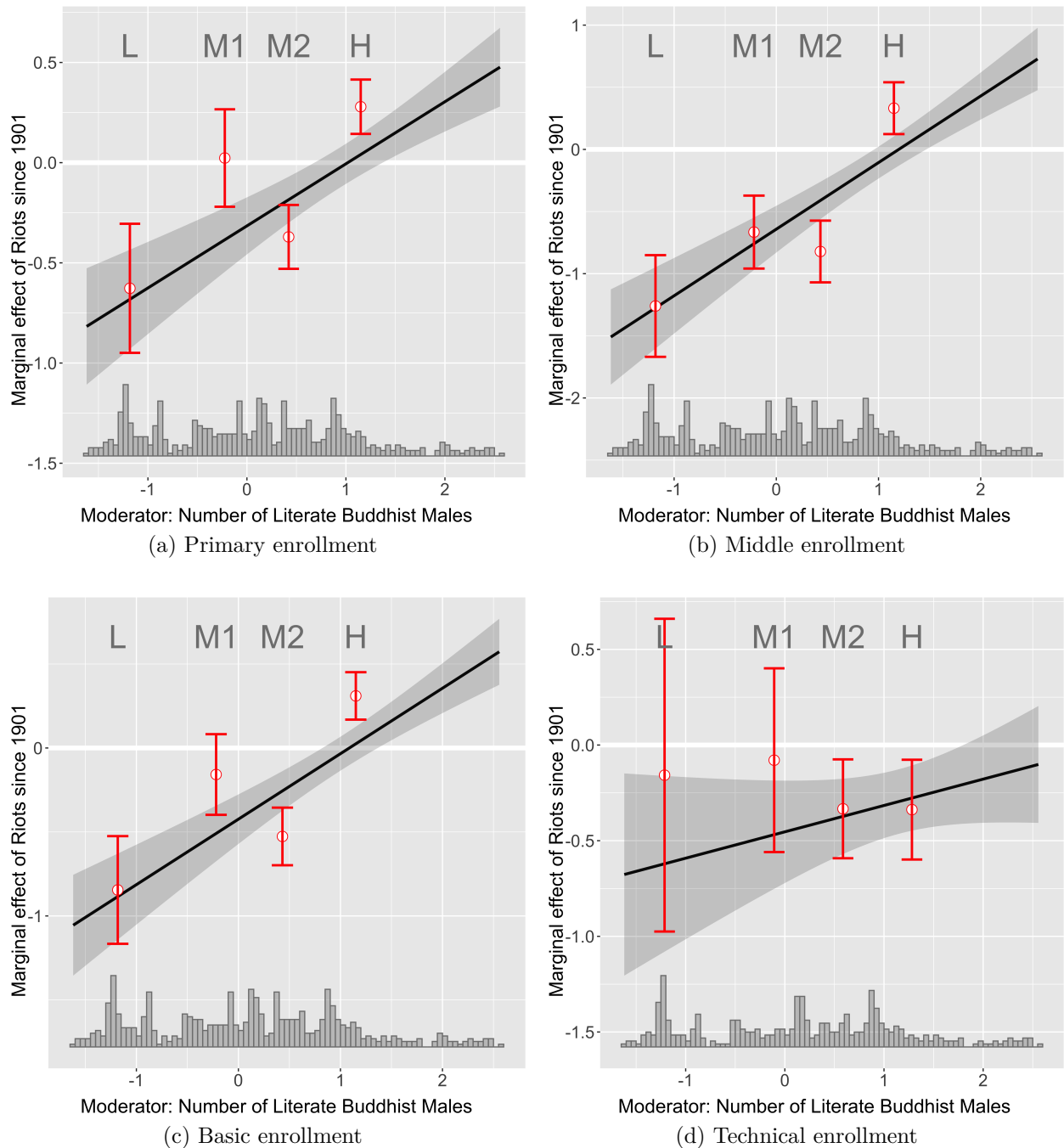


Figure A10: Marginal effects plot of Buddhist male literacy coefficient estimates for various female enrollment outcomes. Standardized two-way fixed effects coefficients. The unit of analysis is district-year. Cluster-robust standard errors with Bonferroni correction for multiple hypotheses testing. Lagged values of Buddhist male literacy. Bold coefficients have 98.75 percent confidence intervals that do not contain null estimates. Census years only. 98.75 percent CIs result from Bonferroni correction (four hypotheses).

3 Supplemental Figures



Figure A11: Administrative divisions of British Burma from 1931 census report. I use this to create the district shapefiles in this paper .

IMPERIAL TABLE VIII.B.—Literacy by Religion and Age.

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DISTRICT, RELIGION AND AGE.		POPULATION.									Literate in English.		
		Total.			Literate.			Illiterate.					
		Persons.	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.
1		2	3	4	5	6	7	8	9	10	11	12	13
KYAUKSE— <i>contd.</i>	MAHOMEDANS BORN IN BURMA.	5,517	2,720	2,797	1,128	883	245	4,389	1,837	2,552	20	20	...
	0—10	1,586	789	797	55	27	28	1,531	762	769	1	1	...
	10—15	650	326	324	152	101	48	498	222	276	...	...	...
	15—20	528	253	275	148	108	40	380	145	235	2	2	...
	20—30	949	458	491	287	213	74	662	245	417	9	9	...
	30 and over	1,804	894	910	486	431	55	1,318	463	855	8	8	...
	CHRISTIAN (ALL AGES).	592	292	300	259	182	77	333	110	223	83	63	20
	OTHERS (ALL AGES)	78	53	25	28	27	1	50	26	24	2	2	...
	ALL RELIGIONS ...	289,897	137,573	152,324	82,224	75,005	7,219	207,673	62,568	145,105	1,207	1,054	153
	0—10	67,912	32,533	35,379	1,831	1,384	447	66,081	31,149	34,932	35	27	8
MEIKTILA.	0—15	35,090	17,468	17,622	7,703	6,718	985	27,387	10,750	16,637	107	88	19
	15—20	31,409	14,582	16,827	10,868	9,662	1,206	20,541	4,920	15,621	139	121	18
	20—30	48,378	22,783	25,595	19,634	17,618	1,986	28,744	5,135	23,609	450	407	43
	30 and over	107,108	50,207	56,901	42,188	39,523	2,655	64,920	10,614	54,306	476	411	65
	BUDDHIST ...	281,618	132,184	149,434	79,476	72,656	6,820	202,142	59,528	142,614	570	547	23
	0—10	66,218	31,697	34,521	1,729	1,310	419	64,489	30,387	34,102	18	16	2
	10—15	34,377	17,071	17,306	7,527	6,596	931	26,850	40,475	16,375	65	55	10
	15—20	30,646	14,118	16,528	10,600	9,445	1,155	20,046	4,693	15,353	83	80	3
	20—30	46,354	21,367	24,987	18,770	16,912	1,858	27,584	4,455	23,129	244	241	3
	30 and over	104,023	47,911	56,112	40,850	38,393	2,457	63,173	9,518	53,655	160	155	5
YAMETHIN.	ANIMIST (ALL AGES)	349	305	44	107	99	8	242	206	36	3	3	...
	HINDU ...	2,644	2,005	639	916	820	96	1,728	1,185	543	172	154	18
	0—10	386	202	184	30	23	7	356	179	177	2	2	...
	10—15	158	86	72	47	35	12	111	51	60	16	13	3
	15—20	156	96	60	50	35	15	106	61	45	5	2	3
	20—30	756	606	150	297	259	38	459	347	112	69	59	10
	30 and over	1,188	1,015	173	492	468	24	696	547	149	80	78	2
	HINDUS BORN IN BURMA.	536	258	278	102	75	27	434	183	251	27	22	5
	0—10	282	138	144	19	14	5	263	124	139	2	2	...
	10—15	76	31	45	19	12	7	57	19	38	5	3	2
YAMETHIN.	15—20	42	17	25	13	8	5	29	9	20	2	1	1
	20—30	70	35	35	26	21	5	44	14	30	11	9	2
	30 and over	66	37	29	25	20	5	41	17	24	7	7	...
	MAHOMEDAN ...	4,283	2,369	1,914	1,024	905	119	3,259	1,464	1,795	104	104	...
	0—10	1,124	587	537	43	35	8	1,081	492	589	...	...	...
	10—15	483	273	210	80	61	19	403	212	191	6	6	...
	15—20	449	219	230	111	95	16	338	124	214	12	12	...
	20—30	833	459	374	268	221	44	565	235	330	30	30	...
	30 and over	1,394	891	503	522	490	32	872	401	471	56	56	...
	MAHOMEDANS BORN IN BURMA.	3,232	1,472	1,760	538	436	102	2,694	1,236	1,458	48	48	...
YAMETHIN.	0—10	1,086	506	580	40	32	8	1,046	474	572	...	...	...
	10—15	449	213	236	66	48	18	383	195	188	4	4	...
	15—20	382	173	209	84	71	13	298	102	196	10	10	...
	20—30	564	242	322	155	117	38	409	125	284	16	16	...
	30 and over	751	308	443	193	168	25	558	140	418	18	18	...
	CHRISTIAN ...	772	532	240	561	403	158	211	129	82	349	238	111
	0—10	119	72	47	21	12	9	98	60	38	13	8	5
	10—15	49	27	22	33	18	15	16	9	7	20	14	6
	15—20	120	99	21	93	76	17	27	23	4	39	27	12
	20—30	217	192	25	205	165	40	42	27	15	104	74	30
YAMETHIN.	30 and over	237	142	95	209	132	77	98	10	18	173	115	58
	OTHERS (ALL AGES)	231	178	53	140	122	18	91	56	35	9	8	1
	ALL RELIGIONS ...	323,189	160,913	162,276	100,415	88,785	11,630	222,774	72,128	150,646	1,845	1,593	252
	0—10	79,718	38,392	41,326	3,519	2,440	1,079	76,199	35,952	40,247	73	46	27
	10—15	38,915	19,666	19,249	9,230	7,550	1,680	29,685	12,136	17,549	231	183	48
	15—20	32,801	15,900	16,901	13,028	11,228	1,800	19,173	4,672	14,501	280	229	51
	20—30	55,174	27,192	27,982	23,709	20,889	2,820	31,465	6,303	25,162	587	531	56
	30 and over	117,181	59,743	57,438	50,989	46,878	4,251	66,252	13,065	53,187	674	604	70
	...	...	...	...	...	...	...	...	...	...	...	...	...
	...	...	...	...	...	...	...	...	...	...	...	...	...

Figure A12: An excerpt from 1921 Census, Literacy by religion and age group.

TABLE XVII.—CRIME, PROME DISTRICT.

Year.	Persons convicted or bound over in respect of										
	Rioting and unlawful assembly.	Offences affecting life.	Grievous hurt.	Cattle theft.	Robbery and dacoity.	House breaking and theft.	Coinage offences.	Bad livelihood.	Offences under the		
									Opium Act.	Excise Act.	Forest Law.
1	2	3	4	5	6	7	8	9	10	11	12
1901	147	15	49	268	8	46	...	296	16	164	47
1902	107	20	92	232	14	42	...	397	184	306	42
1903	93	11	36	260	6	51	...	267	127	325	85
1904	67	15	47	250	15	37	6	202	106	315	62
1905	106	20	67	173	29	40	2	340	193	185	81
1906	71	25	41	157	32	76	...	291	273	260	85
1907	...	13	53	168	19	74	3	160	275	181	39
1908	23	13	44	156	25	66	7	175	193	279	29
1909	...	16	63	122	32	60	..	93	208	235	30
1910	23	23	52	168	26	74	...	143	206	259	98
1911	...										
1912	...										
1913	...										
1914	...										
1915	...										
1916	...										
1917	...										
1918	...										
1919	...										
1920	...										
1921	...										

Figure A13: An excerpt from 1924 Prome District Gazetteer, Education Statistics.

TABLE XXIV.—EDUCATIONAL STATISTICS, PROME DISTRICT.

Year.	High Schools.		Middle Schools.		Upper Primary Schools.		Lower Primary Schools.		Technical training and other schools, public and private.		Expenditure on Education from										
	Schools.	Average daily attendance of scholars.	Schools.	Average daily attendance of scholars.	Schools.	Average daily attendance of scholars.	Schools.	Average daily attendance of scholars.	Schools.	Average daily attendance of scholars.	Schools.	Average daily attendance of scholars.	Provincial funds.	District Cess fund.	Municipal funds.	Fees.	Other sources.	Total expenditure.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1901-02 ...	1	317	...	17	982	256	32	1,182	296	73	1,746	319	428	5,699	165	Rs. 4,674	Rs. 9,400	Rs. 26,469	Rs. 7,247	Rs. 10,100	Rs. 57,890
1902-03 ...	3	639	31	18	1,394	362	57	1,842	512	69	1,680	190	455	5,929	352	3,653	10,766	25,465	8,183	10,100	58,172
1903-04 ...	3	582	77	17	1,127	284	50	1,153	357	56	729	142	428	5,129	194	8,771	12,027	28,998	9,730	10,100	69,626
1904-05 ...	4	769	141	18	1,095	298	71	1,848	559	72	1,205	153	422	4,829	197	9,234	12,465	24,223	10,036	7,900	63,861
1905-06 ...	3	718	130	18	1,417	482	79	2,495	704	78	1,722	495	419	5,580	171	15,300	14,222	25,298	15,077	...	69,897
1906-07 ...	3	713	107	24	1,576	502	79	2,976	788	97	2,360	809	422	5,214	194	17,775	15,202	25,845	14,772	...	73,594
1907-08 ...	4	1,028	228	23	1,586	491	74	2,165	925	74	3,042	852	423	5,302	251	19,065	19,140	21,495	14,410	...	74,110
1908-09 ...	5	868	111	22	1,585	462	94	3,454	1,174	89	2,054	849	421	5,324	218	21,332	20,130	10,030	16,068	...	67,560
1909-10 ...	5	794	115	25	1,680	525	110	3,632	1,402	86	1,829	472	413	4,429	129	17,504	19,442	10,258	17,432	300	64,936
1910-11 ...	6	1,120	114	21	1,321	578	76	2,411	1,110	107	2,243	766	435	4,582	155	20,472	16,354	7,428	20,311	...	64,566
1911-12 ...																					
1912-13 ...																					
1913-14 ...																					
1914-15 ...																					
1915-16 ...																					
1916-17 ...																					
1917-18 ...																					
1918-19 ...																					
1919-20 ...																					
1920-21 ...																					

Figure A14: An excerpt from 1924 Prome District Gazetteer, Education Statistics.

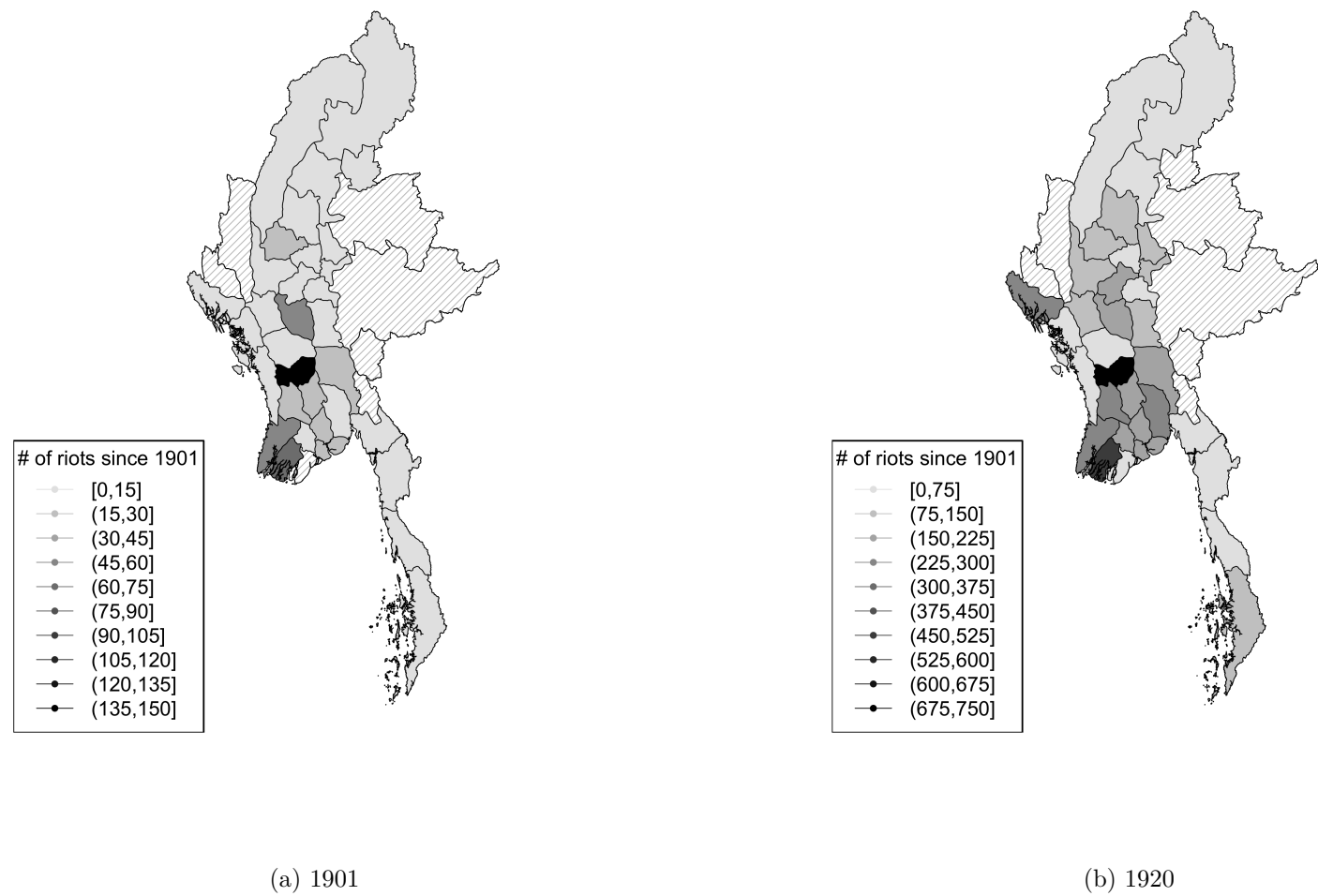
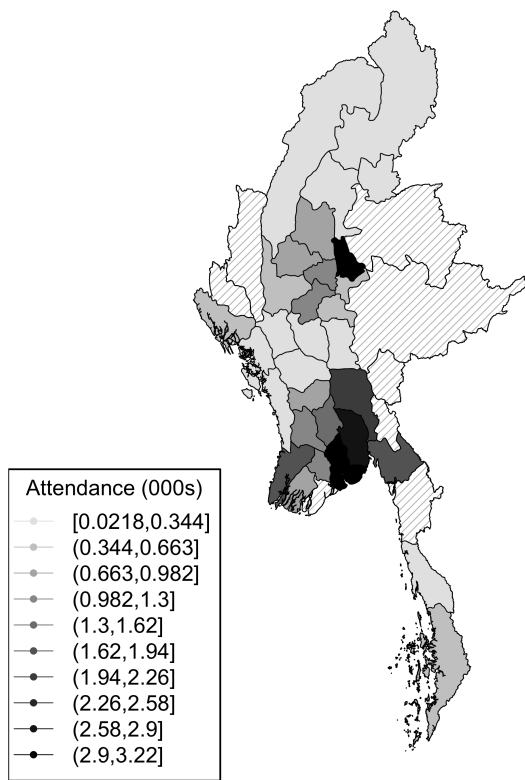
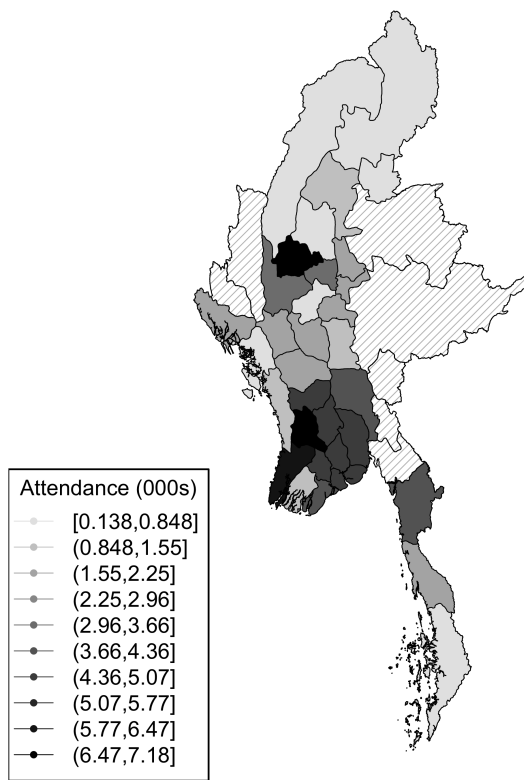


Figure A15: Number of riots since 1901 by district in 1901 and 1920. Darker colours represent higher levels of riots. Data from British Burma Censuses in respective years. Shaded areas represents parts of the indirectly-ruled Frontier Area for which colonial education data is not available.



(a) 1901



(b) 1920

Figure A16: Female attendance in primary and middle schools by district in 1901 and 1920. Darker colours represent higher levels of attendance. Data from British Burma Censuses in respective years. Shaded areas represents parts of the indirectly-ruled Frontier Area for which colonial education data is not available, those whose data is unavailable for the particular year.