The Fight for Eden:
A Mixed-Methods Analysis of Historical Educational Competition and its Legacies

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Abstract

The present dissertation sets out to examine the legacies of Protestant missionary activities in Ottoman Turkey (Eastern Thrace and Anatolia) using a multiplicity of comparative historical methods. Research on missionaries has painted these historical actors either as pioneers of human capital or fomenters of sedition. I fail to find evidence supporting either argument in Ottoman Turkey. Rather, the most consequential dimension of missionary activities in the region was the ways in which they galvanized indigenous communities to increase their investments in the modernization of public schooling. Educational competition, in turn, is singled out as one of the key mechanisms contributing to Armenian nationalism, gender parity in education, and economic development.

The dissertation is composed of three separate articles. In the *first article*, I engage with a number of studies that suggest Protestant missionaries cultivated Armenian nationalism in the Ottoman Empire through the import of ideas related to the Enlightenment and nation building. While acknowledging that missionaries had an effect on Armenian nationalism, this article finds that their impact on nationalism was much more unintended than is commonly assumed and resulted primarily from Armenian reactions to growing missionary influence. Through the construction of a dataset on the biographies of Armenian nationalist leaders and a narrative analysis based on archival sources, the article offers evidence that missionary influence spurred a backlash among the Armenian community that intensified pre-existing local initiatives, increased investment in mass education in the provinces, and modernized its schooling system, all three of which popularized and strengthened Armenian nationalism.

Building on the insights drawn from the first article, the *second* and *third articles* engage with the quantitative literature on missionary societies. To this end, I construct an original historical Geographic Information System (GIS) dataset that combines

contemporary socio-economic data, geographic data, and geocoded data from historical records. The quantitative literature on missionaries demonstrates that the presence of these historic societies — especially Protestant societies — during the colonial period is significantly and positively associated with increased educational attainment and economic outcomes. Yet, most of these studies fail to specify whether this finding is the result of missionary investments in human capital (direct effects) or local actors stepping up their educational efforts in reaction to missionary activities (indirect effects). The second and third articles uses the historical experience of Ottoman Turkey to separate both effects. Due to the ethnic violence and population movements at the start of the twentieth century, the newfound Turkish nation-state was largely religiously homogenous. Additionally, the emergent nationalist government banned all primary missionary schools, effectively ceasing the majority of evangelical operations in Turkey. This provides us with a unique situation to empirically assess the long-run indirect effects of Christian missionary societies on local human capital.

The *second article* contributes to debates on the missionary influences on long-run gender development through a mixed-methods design. Previous research claims that Protestant missionaries' emphasis on literacy and education propelled human capital formation within indigenous populations. A number of studies further claim that the most significant contribution of Protestant missionary education was women's emancipation, which manifested itself in comparatively larger educational gains for women when compared to men. Contrary to the common association found in the literature, this paper does not find missionary presence to be correlated with modern-day schooling rates. Rather, I find that regions with a heightened missionary presence and an active Christian educational market perform better on the Gender Parity Index for pre-tertiary schooling during both the Ottoman and Turkish periods. I complement this statistical finding with archival

evidence, demonstrating that missionary-triggered competition led to the broadening of educational provision by the Armenian Patriarchate and Ottoman state, leading to its greater social acceptability and demand.

The *third article* builds on the second paper and investigates the link between gender parity and economic development over the long-run. A growing scholarship claims that gender equality can be beneficial for economic development. The findings in this paper confirms this link over the long-term, showing that competition – working through gender parity – had positive human capital spillovers for the Muslim population and is a significant factor explaining subnational variations in economic development in Turkey today. Results show that places with historically heightened competition between missionary schools and native educational institutions are more likely to have higher income, as measured by night-time light density.

Overall, the dissertation highlights the importance of historical institutions in determining long-run development. Analyzing the ways in which Armenian Patriarchate and the Ottoman state reacted to Protestant missionary incursions in the nineteenth century, one of the central claims is that the historic educational competition popularized educational innovations that were previously unknown in the region. This dissertation adds growing body of research that utilizes spatial analysis techniques, identifying a strong and consistent association between historic missionary societies and positive long-term socio-economic outcomes. It also marks one of the first effort to apply GIS technology to the study of the Ottoman Empire, creating boundary files that possess unique value for future research. The results of this research suggest that missionary studies should take local characteristics into account, especially in places with long-standing traditions of statehood and organized religions.

Résumé

La présente thèse vise à examiner les héritages des activités missionnaires protestantes dans la Turquie ottomane (Thrace orientale et Anatolie) en utilisant une multiplicité de méthodes historiques comparatives. Les recherches sur les missionnaires ont dépeint ces acteurs historiques comme étant soit des pionniers du capital humain, soit des fomentateurs de sédition. Je n'ai trouvé aucune preuve appuyant ces deux arguments en Turquie ottomane. La dimension la plus conséquente des activités des missionnaires dans la région était plutôt la manière dont ils ont galvanisé les communautés autochtones pour qu'elles augmentent leurs investissements dans la modernisation de l'enseignement public. La concurrence dans le domaine de l'éducation est à son tour désignée comme l'un des principaux mécanismes contribuant au nationalisme arménien, à la parité des sexes dans l'éducation et au développement économique.

La thèse est composée de trois articles distincts. Dans le premier article, je m'intéresse à un certain nombre d'études qui suggèrent que les missionnaires protestants ont cultivé le nationalisme arménien dans l'Empire ottoman par l'importation d'idées liées au siècle des Lumières et à la construction de la nation. Tout en reconnaissant que les missionnaires ont eu un effet sur le nationalisme arménien, cet article constate que leur impact sur le nationalisme était beaucoup plus involontaire qu'on ne le pense communément et résultait principalement des réactions arméniennes à l'influence croissante des missionnaires. Par l'assemblage d'une base de données sur les biographies des leaders nationalistes arméniens et à une analyse narrative fondée sur des sources d'archives, l'article apporte la preuve que l'influence des missionnaires a provoqué un contrecoup au sein de la communauté arménienne qui a intensifié les initiatives locales préexistantes, augmenté les investissements dans l'éducation provinciale de masse et modernisé son système scolaire, soit trois éléments ayant popularisé et renforcé le nationalisme arménien.

S'appuyant sur les constats tirés du premier article, les deuxième et troisième articles abordent la littérature quantitative relative aux sociétés missionnaires. À cette fin, je construis un ensemble de données historiques originales pour le système d'information géographique (SIG), combinant des données socio-économiques contemporaines, des données géographiques et des données géocodées qui proviennent de documents historiques. La littérature quantitative sur les missionnaires démontre que la présence de ces sociétés historiques - en particulier les sociétés protestantes - pendant la période coloniale est associée de manière significative et positive à l'augmentation du niveau d'éducation et aux performances économiques. Cependant, la plupart de ces études ne précisent pas si ce résultat est le fruit d'investissements des missionnaires dans le capital humain (effets directs) ou d'un renforcement des efforts éducatifs des acteurs locaux en réaction aux activités des missionnaires (effets indirects). Les deuxième et troisième articles utilisent l'expérience historique de la Turquie ottomane pour séparer les deux effets. En raison de la violence ethnique et des mouvements de population au début du XXe siècle, le nouvel État-nation turc était largement homogène sur le plan religieux. En outre, le gouvernement nationaliste émergeant a interdit toutes écoles primaires de missionnaires, mettant ainsi fin à la majorité des opérations évangéliques en Turquie. Cela nous fournit une situation unique permettant d'évaluer empiriquement les effets indirects à long terme des sociétés missionnaires chrétiennes sur le capital humain local.

Le deuxième article contribue aux débats sur les influences des missionnaires sur le développement à long terme des sexes via l'utilisation d'une méthode de recherche mixte. Des travaux antérieurs soutiennent que l'accent mis par les missionnaires protestants sur l'alphabétisation et l'éducation a favorisé la formation du capital humain au sein des populations autochtones. Un certain nombre d'études affirment aussi que la contribution la plus significative de l'éducation missionnaire protestante a été l'émancipation des femmes, qui

s'est manifestée par des gains éducatifs comparativement plus importants pour les femmes que pour les hommes. Contrairement à l'association courante que l'on trouve dans la littérature, cet article ne révèle aucune corrélation entre la présence des missionnaires et les taux de scolarisation actuels. Je constate plutôt que les régions où la présence missionnaire est plus importante et où le marché de l'éducation chrétienne est actif obtiennent de meilleurs résultats en ce qui concerne l'indice de parité des sexes pour la scolarité prétertiaire, tant pendant la période ottomane que pendant la période turque. Je complète ce résultat statistique par des preuves d'archives, démontrant que la concurrence déclenchée par les missionnaires a mené à l'élargissement de l'offre éducative du patriarcat arménien et de l'État ottoman, ce qui a conduit à une meilleure acceptabilité sociale et à une plus grande demande.

Le troisième article s'appuie sur le second et examine le lien à long terme entre la parité hommes-femmes et le développement économique. Un nombre croissant de chercheurs postulent que l'égalité des sexes peut être bénéfique pour le développement économique. Les conclusions de cet article confirment ce lien sur le long terme, en montrant que la concurrence - qui passe par la parité entre les sexes - a eu des retombées positives sur le capital humain de la population musulmane et constitue un facteur important expliquant les variations infranationales du développement économique en Turquie aujourd'hui. Les résultats montrent que les endroits où la concurrence entre les écoles de missionnaires et les établissements d'enseignement autochtones est historiquement plus forte sont plus susceptibles d'avoir des revenus plus élevés, ce qui est mesuré par la densité de la luminosité nocturne.

Dans l'ensemble, la thèse souligne l'importance des institutions historiques afin de déterminer le développement à long terme. En analysant la façon dont le patriarcat arménien et l'État ottoman ont réagi aux incursions des missionnaires protestants au XIXe siècle, l'un des principaux postulats est que la concurrence historique en matière d'éducation

a popularisé des innovations éducatives jusqu'alors inconnues dans la région. Cette thèse ajoute à un corps de recherches croissant qui utilise des techniques d'analyse spatiale, identifiant une association forte et cohérente entre sociétés missionnaires historiques et résultats socio-économiques positifs à long terme. Elle marque également l'un des premiers efforts pour appliquer la technologie SIG à l'étude de l'Empire ottoman, en créant une documentation des frontières qui possèdent une valeur unique pour les recherches futures. Les résultats de cette recherche suggèrent que les études sur les missionnaires devraient tenir compte des caractéristiques locales, en particulier dans les endroits où il existe une longue tradition d'État et de religions organisées.

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Life it appears has come full circle. My mother left Canada in 1984 to start a life with my father in Turkey. She became an English teacher at the Üsküdar American High School in 1993, a school I would also call my own during my teenage years. Fast forward 12 years and life finds me here presenting a work on the very missionaries that set up this school. Completing a dissertation entails incurring a series of debts one will likely never be able to repay. The following is an attempt to recognize those individuals and institutions that have supported this project from its earliest inception to ultimate completion.

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Mistakes and shortcomings are, of course, solely mine.

Glossary of Terms

Armenian National Constitution: A code of regulations approved by the Sultan in 1863 that defined the powers of the Patriarch and the newly formed Armenian National Assembly. The document is referred to as the Armenian National Constitution (*Azgayin Sahmanadrut'iwun Hayoc*) in Armenian, and The Regulation of the Armenian Patriarchate (*Ermeni Patrikliği Nizamatı*) in Ottoman Turkish.

Armenian Patriarchate: Refers to the Armenian Patriarchate of Istanbul in the text. The Armenian Patriarchate of Istanbul was the institution that represented Ottoman Armenians to the Sublime Porte and the Palace.

Amira: Elite Armenian financier class living mostly in Western Anatolia and Thrace.

Ashkharh: Armenian word for "world", often used to refer to the larger Armenian community.

Ashkhahrhabar: Armenian vernacular.

***Azg*:** Armenian word for nation.

Berat: License of privilege.

Bab-ı Ali: See Sublime Porte.

Catholicos: The ecclesiastical head of the Armenian Gregorian Church at Echmiadzin.

Common schools: Quasi-public schools that emerged out of the nineteenth-century education movement in the United States. These type of schools were set up by missionary educators outside the United States.

Dhimmi (zimmi): A non-Muslim subject of a state governed by Islamic law.

Esnaf: Merchant guilds.

Eyalet: The main administrative division in the Ottoman Empire. Similar to province or state. Also spelled eyâlet.

Ferman: Decree issued by the sultan. Also spelled firman.

***Geocode*:** is the process of converting an address or name of a place into latitude/longitude location on the Earth's surface.

***Georeferencing*:** is the process of ascribing geographic information to an image that does not contain any such information.

***Grabar*:** Ancient Armenian.

Gregorian Armenian Church: National church of the Armenian people. Also referred to as the Armenian Church, Armenian Orthodox Church or Armenian Apostolic Church.

***Gülhane Hatti-ı Serif*:** The reform edict decreed by the Ottoman sultan in 1839.

***Hatt-ı Hümayun*:** The Imperial Reform Edit decreed by the Ottoman sultan in 1856.

İbtidâî: Tanzimat-era lower primary Ottoman schools that educated children according to the new teaching methods (usul-i cedid). Ibtidai schools first appeared in the capital in 1872 and spread after throughout the empire.

İdadi: Tanzimat-era high school. These schools are higher than rüşdiyyes but lower than sultanis.

İlçe: Modern Turkish district.

Jihad: Holy way.

Kaza: Administrative subdivision of a sanjak consisting of a large town or cluster of villages. Under the jurisdiction of a kadı.

Main-station: A place of missionary residence in or from which missionary activity in a given area is carried out.

Meclis: Town council.

***Mekhitarists*:** a monastic order of the Armenian Catholic Church founded in 1717 by Abbot Mekhitar of Sebaste (Sivas). The Mekhitarist monks revived Armenian literature, language and history through their publications and set up an extensive net-work of schools in Armenia proper and elsewhere in the empire.

Millet: Confessional community within the Ottoman Empire.

Ottoman Turkey: The geographic region encompassing Eastern Thrace and Anatolia, corresponding to the modern boundaries of Turkey.

Out-station: A remote missionary location connected to a main-station in which missionary activity is carried out.

Padisah: Superlative title for the sultan.

Paşa: Honorific title given to state-appointed political and military elites of the Ottoman Empire. Also spelled pasha.

Rüşdiyye: Secondary schools set up during the tanzimat to educate adolescents.

Salname: An official governmental yearbook or annual report in the nineteenth-century Ottoman Empire; official provincial yearbook.

Sancak (Sanjak): A subdivision of a province (eyalet, vilayet, beylerbeyilik), translated as sub-province.

Sarraf: The Ottoman designation for a banker or moneylender who was primarily involved in the iltizam taxation system.

Sharia: Islamic law, derived from the Quran, hadith, analogy, and consensus.

Sıbyan: lower primary schools.

Sublime Porte: A term for the central government of the Ottoman Empire. Also known as *the Porte* or *Bab-ı Ali*.

Sola Scriptura: One of the central principles in Protestant theology that claims that one can understand God's word only by reading the Bible.

Tahrir-i Nüfus: Census. Literally inscription or record of population.

Takrir: A lengthy letter of petition or complaint, a list of grievances.

Tanzimat: A series of modernizing reforms initiated by the Sublime Porte between 1838 and 1876. The period in question is referred to as the Tanzimat Era.

Ulema: Sunni Muslim religious scholars.

Vali: Provincial governor of an eyelet or vilayet.

Vartabed: A highly educated bishop of the Armenian Gregorian Church.

Vilayet: A province, the largest administrative division of the empire in the sixteenth-century, headed by a governor or beylerbeyi.

Zartonk: Armenian renaissance

Introduction

For they [missionaries], too, are agents in an only partly written story, the story of how empires were built and also resisted. It tells us that some of the big moments of modern history happened beyond the purview of guns and governments, in the deserts where men bearing sextants and moral certainties confronted local populations with their own values and determinations. Out of this encounter came new maps, new systems of human relationship, new concepts of power, divinity, and personhood, of time and labor.

– Jean Comaroff, *Missionaries and Mechanical Clocks*

On the other side of Jordan,
In the sweet fields of Eden,
Where the tree of life is blooming,
There is rest for you.

– Christian Hymn, *Rest for the Weary*

Toward a Theoretical Contribution: Debates in the Literature

On November 14, 2018, 26-year-old John Allen Chau hired some fishermen to illegally transport him to North Sentinel Island, a region inhabited by hunter-gatherers notoriously unwelcoming to outsiders. Armed with only his waterproof Bible, Chau was hell-bent on bringing Christianity to the locals. His dead body was discovered several days later by the same fishermen that took him there. The tragic story of John Chau ignited a heated public debate over whether missionaries do more harm than good. For some, they are relics of an imperial age—imposing Western culture onto humanity, upending or erasing traditional ways of life in the process. Others see them as crucial aid workers making significant contributions to the educational and health care systems in the developing world.

The academic debate surrounding the legacies of foreign missionaries during the nineteenth largely follows much in the same vein. On the one side, missiologists and economic historians praise the many benefits of missionary activities, viewing them as precursors to modern aid workers who supplanted democracy and sowed the seeds of development in the non-Western world. Missionary historians emphasize the importance of Protestant missionaries in the expansion of public education (Ingham 1956), adoption of the printing press (Zhang 2007; Davies 1994), the emergence of non-violent, translocal social movements (Anstey 1975; Hall 2002; Stamatov 2010) and curbing the abuses of colonial governments and fostering the rule of law. A growing statistical literature reinforces this view, linking Protestant activities and investments to improved socio-economic outcomes that appear to persist for many generations.[1] An early contribution by Woodberry (2004)

[1] This literature has been an outgrowth of the bourgeoning empirical literature demonstrating historical institutions or events as powerful determinants of contemporary outcomes (e.g., Robinson, Acemoglu, and Johnson 2001; Engerman et al. 2002; Glaeser et al. 2004; Alesina, Giuliano, and Nunn 2013; Michalopoulos and Papaioannou 2013; Lowes and Montero 2018; Nunn 2008). A related literature has also studied the influence of religion and religious institutions on economic development (Barro and McCleary 2003; McCleary and Barro 2006;

documented a positive relationship between measures of the historical presence of missionaries and current per capita income and democracy across former non-settler colonies. Subsequent studies, usually focusing on a single region or country, corroborated this earlier finding. For example, Bai and Kung (2015) look within China and examine county-level data from 1840 and 1920. They identify a positive relationship between Protestant missionary activity and economic development, measured using urbanization rates. Mantovanelli (2014) shows that Protestant missionaries are also associated with higher literacy in India. Similarly, current health outcomes are better the closer a village is to historical Protestant medical missions (Calvi and Mantovanelli 2018). Nunn (2014) looks at Protestant and Catholic missionary activity in Africa and finds that both have long-term positive impacts on education, although women's educational gain was comparatively larger in Protestant areas, and Cagé and Rueda (2016) document a long-run impact on present-day newspaper readership. Okoye and Pongou (2014) study historical missionary activity in Nigeria, and find that it had persistent effect on schooling outcomes.

McCleary and Barro (2019) have cautioned against equating all forms of Protestantism as equally beneficial for human capital acquisition. In Guatemala, Mainline Protestants placed a higher value on education whilst Evangelical, Pentecostal, and neo-Pentecostal denominations and churches focused their efforts on evangelizing, emphasizing eschatological urgency of conversion with little investment in human capital.[2] Examining denominational differences in Mexico, Waldinger (2017) finds that different Catholic monastic traditions affect contemporary educational figures differently. She finds that areas

Barro and McCleary 2005) and has singled out the role of Protestantism as a fundamental source of economic and social development (Becker, Hornung, and Woessmann 2009; Becker and Woessmann 2008; Becker and Woessmann 2009).

[2] For an early review of this literature see Woodberry (2011). Becker, Pfaff, and Rubin (2016) also provide comprehensive survey of recent works on short- and long-run effects of the Reformation, including Protestant-Catholic differences in human capital.

with historical Mendicant missions have higher contemporary high school completion and literacy rates when compared to regions that were associated with Jesuit missions. Researchers have also begun to recognize that the competition between Catholic and Protestant missionary orders may play a key role in determining long-term socio-economic outcomes. Trejo (2009) for example, finds that religious competition between Catholic and Protestant orders is a strong predictor of contemporary indigenous mobilization. Gallego and Woodberry (2010) find that educational activities of missionaries were more productive in places where multiple missionary orders competed for the conversation of native people.

By contrast, those working largely within nationalist, post-modern, and post-colonialist intellectual frameworks, see this view as severely misguided. These perspectives view missionaries as an indispensable component of imperialism's three Ms (merchants, missionaries, and the military).[3] To a greater or lesser extent, all of them condemn missionaries for promoting Imperial expansion, assuming racial superiority and training agents of collaborators. Missionaries in these studies are commonly portrayed as: cultural imperialists and agents of social control (Schlesinger Jr 1974); "moral equivalents" of empire (Hutchison 1987); "colonizers of the consciousness" and midwives in the construction of colonial and neocolonial mentalities (Comaroff and Comaroff 1997: 8–18). If not the directly indicted as henchmen of empire, they are held responsible in creating "a docile and efficient labour force which would accept both European religions and political authority, as well as European social superiority" (De Kock 1996: 71).

Scholars located within the post-colonial paradigm have also implicated missionaries in the "colonial discourse", that is the way the subaltern native is constructed within colonizer societies. Edward Said's work — whilst not dealing with missionaries explicitly —

[3] In the words of Brahmabandav Upadhayaya, "First comes the Missionary, and then comes the Resident, lastly comes the Regiment" (quoted in, Dharmaraj 1993).

links Protestant missions in the Middle East to European colonial expansion in the region (Said 1979: 100). He accuses the European drive to dominate the Orient in the "romantic redemptive terms of a Christian mission" (pp. 300–301, 283, 172). Said (1979; 1994) claims that tropes of missionaries — that portrayed indigenous cultures as immoral, benighted, idolatrous, pagan, barbaric, infidel, etc. — were fundamental in maintaining Western hegemony. An influential article written by Schlesinger Jr (1974) levelled the additional charge of "cultural imperialism" against missionaries.[4] Over the next two decades, this allegation generated a heated debate within missionary studies over the culpability of missionaries in the imperial project and the nature of hegemony and cultural transfer (Dunch 2002; Harris 1991; Porter 1999; Porter 1997).

The assertion that missionaries were partners in overseas Imperialism precede the more recent postcolonial discussion of orientalist discourse and cultural imperialism by several decades. Critiques of missionary orders can also be found in the nationalist historiography of many emerging nation-states that were trying to assume their position in the world order of sovereign nation-states and rid themselves of relationships of historical dependence. This brand of anti-missionary sentiment is most prevalent in the writings of Chinese nationalists from the 1920s (Lutz 1976),[5] but was reproduced in other parts of the world. The newly established secular republics of Iran and Turkey both decided to shut down missionary primary schools in the 1930s. Ghandi, whilst recognizing the importance of humanitarian missionary work such as education, medical service to the poor and the like, still preached caution. Stating that if "they[missionaries] would use these activities of theirs for the purpose of proselytizing, I would certainly like them to withdraw . . . I hold that

[4] Schlesinger Jr (1974) defines cultural imperialism as "the purposeful aggression by one culture against the ideas and values of another."
[5] Mao Zedong would later go on to characterize even the seemingly beneficial efforts in healthcare and education as cultural aggression (Dunch 2002).

proselytizing under the cloak of humanitarian work is, to say the least, unhealthy" (quoted in, Schlesinger Jr 1974: 366–67).

A point of convergence for missiologists and post-colonial authors in recent years has been added emphasis on local agency; drawing specific attention to the irony, resistance, hybridity, selectivity in non-Western appropriations of Christianity. This has shifted the spotlight away from foreign transmission onto depictions of local reception. Even though missionaries openly expressed their desire to replace indigenous cultures with European civilization, and frequently—but not always—allied themselves with colonial governments,[6] the native populations still selectively rejected, utilized, or retranslated Christianity for their own ends and needs (De Kock 1996; Gray 1990; Sanneh 1983). This view has developed hand-in-hand with the recognition that a vast majority of Christian evangelicals were "native" workers and hardly passive recipients of evangelization. The work of West African theologian, Lamin Sanneh, for example, acknowledges that a great deal of acculturation was involved in Christian proselytizing, thus missionary work should be best studied as a process of cultural translation. Piers M. Larson (1997) applies insights from post-structuralism to reach a similar conclusion, showing how highland Malagasy peasants appropriated the religious idioms of European missionaries to suit their own cultural logic. The "irony" of conversion has also been taken up in studies linking missionaries to anti-colonial nationalism (Masondo 2018; Harper 1995; Reeves-Ellington 2004; Reid 1978; Phipps 1972). Jean Comaroff (1991), summarizes this position succinctly, stating that while missionaries "helped sow the state of colonialism on which the colonial state was founded," they simultaneously communicated, "a language for contesting the new modes of domination it had itself helped

[6] The collaboration of church-colonial state is most clear in the Spanish and Portugese expansion into the Americas. For more a nuanced discussion of the cooperation between missionaries and colonial governments see Stephen Neill's *Colonialism and Christian Missions.*

create" (p. 7). It is for this reason that missionary education and missionary-initiated social organizations has been linked to first wave nationalism across the globe (Woodberry 2007). Scholars are also beginning to demonstrate that missionary history is not only "about" Christianity and its transmission but also covers the social and political lives of non-Christian individuals and communities (Comaroff and Comaroff 1997; Dunch 2001; Peel 2000; Sharkey 2013). Even when the Christian message of missionaries was rejected, communities entered a conversation with missionaries, and were changed through this process.

The reorientation of the debate towards the ways in which local populations changed in the course of their interactions with missionaries has gone largely unrecognized in quantitative studies. This is surprising given that one study recognizes that "indigenous education systems may have been equally (or more?) determining to human capital formation as was colonial education" and may have "interacted with the development of colonial education systems" (Bolt and Bezemer 2009: 29). To the best of my knowledge, the work of Lankina and Getachew (2013) is the only quantitative study that deals with indigenous reactions to missionary expansion. Their research draws attention to the importance of competition between religious and secular actors in the expansion of mass female education in Kerala. The present dissertation is closest to this work in approach and aims to apply the insights gained from Kerala to the case of Ottoman Turkey. Indigenous education systems in both places predated and often co-existed with missionary education efforts, and may have changed as Western concepts and institutions were disseminated. The majority of previous research linking Protestant missionaries to contemporary development fails to acknowledge modernizing indigenous education as a crucial influence in determining local human capital formation. Similarly, the nationalist literature implicating missionaries in the spread of seditious ideas tend to omit the tense and often complex relationship between the indigenous religious hierarchies and evangelicals.

This dissertation carries the continuing debate over missionaries' legacies outside the West to the fin-de-siècle Ottoman Empire, studying the missionaries sent to the region by the American Board of Commissioners for Foreign Missions (ABCFM), and indigenous actors' responses to their expansion. I engage in ongoing debates on the varied legacies of missionary education in the Ottoman Empire, as well as the deep roots and historical determinants of Turkish socio-economic development. Turkish scholarship has seen missionaries as a pernicious influence and an extension of foreign powers' ambitions in Ottoman lands. Scholars working within this nationalist framework claim that they spread seditious ideas and played an important role in the downfall of the Ottoman Empire (Öney 2014; Gürün 2005; Karakoç 2009; Öke 2000; Sertçelik 2010; Sonyel 2009; Şimşir 2005; Şimşir 2018). This discourse ignores the tense relationship that existed between the Armenian Church and the missionaries, and also the willingness of parents to send their children to mission schools. It also ignores how educational standardization efforts of both the Armenian Patriarchate and Ottoman state were intimately linked to the expansion of missionary schooling. Recognizing missionaries as a significant actor in the Ottoman educational system allows me to empirically assess indigenous reactions.

Case Selection

My dissertation articles focus on the case of the Ottoman Turkey, a geographic region encompassing Eastern Thrace and Anatolia, corresponding to the modern boundaries of Turkey. I have opted for this depiction because it captures the long-term analysis connecting two distinct political formations without giving into methodological nationalism. The research questions center on the legacies of missionary activities which helps delimit the temporal boundaries of my analysis as 1820s to present. I have limited my focus on this region and period for a number of theoretical, methodological, and practical reasons.

Firstly, the Ottoman Empire was never formally colonized by a foreign power, and shares many typical characteristics with other non-colonized regions;[7] it serves as an ideal type in this regard. The non-colonized land based empires of the nineteenth century found themselves in a similarly precarious position in which they had to reform to survive. In order to withstand the aggressive military and economic expansion of European powers, these traditional empires embarked on self-strengthening movements intent on reforming their bureaucracies and militaries. Education was a key tool in staffing these rapidly expanding government institutions. Whereas, colonial states typically limited the existence of indigenous education and relied instead on missionary schools to create an educated class of colonial administrators,[8] imperial state-run schools were the favored route to military and

[7] By stating that the Ottoman Empire was not colonized, I am not claiming that it was free from foreign influence. During the course of the nineteenth century, the Ottoman Empire entered into multiple unequal treaties with European powers, was incorporated as a periphery into the global capitalist economy, and experienced acute interventions into its domestic affairs. The aim here is rather to differentiate formal colonialism from imperialism.

[8] The cost-effective nature of educational outsourcing, absence of a formalized indigenous education system, and cultural affinity between missionaries and the colonial state compelled colonial administrators to entrust educational efforts to missionaries (Lugard 2013). That being said, in some colonies, colonizers simultaneously tried to establish a Western-style school system whilst also offering subsidies to indigenous schools willing to follow colonial regulations. This was the case in both Egypt and Punjab (Langohr 2005).

bureaucratic positions within non-colonized empires. These schools existed alongside other forms of indigenous and the foreign missionary schooling. The non-colonial context thus provides a unique opportunity to study the effects of a pluralistic and (relatively) free educational market.

Countries that were not colonized were unique in additional ways that were conducive to making this educational environment an especially rivalrous one. They were most commonly multi-ethno-religious empires representing a world religion and had longstanding histories of statehood (Ertan, Fiszbein, and Putterman 2016). The competition between indigenous actors and missionaries was most marked in such places with long standing state traditions and state-sponsored world religions (Tapp 1989). Diverse populations living under a single roof drew missionaries to these regions, who commonly targeted ethnic communities already alienated from the broader polity (Levene 2005: 318). Conversion was less common and traditional elites often perceived the missionaries as a challenge to the unity of their community.[9] In the Middle East, in particular, American Protestant missionaries were trying to convert native populations who were amongst the oldest Christian groups in the world. The Ottoman state, in turn, perceived the missionaries as a disruptive force that was indoctrinating its own citizens with subversive ideas. Under these circumstances, both Eastern Christian hierarchies and the Ottoman state resisted and tried to counteract evangelizing efforts. The Ottoman Turkish case is thus unique in harboring institutionalized hierarchies trying to compete and challenge missionary expansion, making it an ideal location to explore indirect effects.

[9] Places with long-standing state-histories such as India (Deol 2000), Egypt (Sharkey 2005), and China (Dunch 2001) experienced similar rivalries between missionary and indigenous institutions.

A third reason for selecting Ottoman Turkey as a case is data availability. The Ottoman Empire was defensively modernizing in the nineteenth century,[10] which meant similar to other contagious land based empires, it was reforming its bureaucracy and starting to collect information on its general population. It is commonly hard to collect data on colonial-era indigenous education because such institutions were limited and rarely served the political goals of colonial officials. To add to this, the growing awareness and relative ease of accessing missionary archives in English or French has biased the quantitative missionary scholarship to focus on transmissions of missionary education. Thus, the ability to access data on Ottoman and Armenian educational institutions serves as another important reason for choosing this case. Finally, I select the Ottoman case because I conduct a detailed analysis of the interactions between Ottoman and missionary actors. Conducting such an analysis is not possible without considerable knowledge of local languages, historiography and archival collections, and I rely on knowledge of Turkish and Ottoman Turkish to gather data for this particular case.

Finally, because the Ottoman Empire serves as an important and typical case of a non-colonized region, it is also well suited for theory building (Eckstein 1975). Due to feasibility issues I limited the number of cases under analysis to one and do not make explicit comparisons with other cases. That being said, I consider the dynamics identified in this dissertation to be part of a larger picture of missionary encounters outside the West, especially in places with historic statehood and institutionalized work religions.

[10] Defensive modernization can be been defined as a "top-down response to backwardness and attempts to keep sovereignty in the face of external capitalist-geopolitical pressures and conditions of uneven development" (Amasyali & Hall, forthcoming).

Methods and Data

The methodological toolkit of the dissertation includes a variety of primary and secondary within-case comparative-historical methods. The analysis takes place mostly at the meso and macro levels with occasional individual-level accounts incorporated into the narrative to flesh out the mechanisms at play. Each of the articles can be best thought of as a "single-outcome study" (Gerring 2006)[11] addressing a particular debate in the literature on missionaries and testing these theoretical assumptions through a mixed-method design.

Primary within-case methods (i.e., data producing methods) that are employed in this dissertation include historical narrative, internal comparison and Geographic Information Systems (GIS). Historical narratives help me contextualize and temporally order the expansion and institutionalization of education in the Ottoman Empire. I have most commonly broken down this historical narrative and incorporated segments of it into my casual narrative. The historical data is based on secondary literature, published primary sources, and archival documents. The archival data is the result of archival work that I have conducted in Turkey and the United States between 2017 and 2019. The data on Protestant missionaries in Turkey is primarily drawn from the Archives of the American Board of Commissioners for Foreign Missions (ABCFM) at Houghton Library, Harvard University and the private library and archive of the *Amerikan Bord Heyeti* at the American Research Institute in Turkey (ARIT) in Beyoğlu, Istanbul. Turkish and Ottoman sources, on the other hand, come from the Ottoman and Republican Archives of Turkey in Ankara and Istanbul. My archival research helped me map out the interactions between the people in the Middle East and the American missionaries through documents that include personal papers,

[11] Gerring (2006) defines a single-outcome study as a study that "investigates a bounded unit in an attempt to elucidate a single outcome occurring within that unit" (p. 710). This definition is closest to that of an ideographic case study.

memoirs, letters, takrirs (petitions), fermans (decrees), diaries, travelogues, lectures, unpublished manuscripts, and newspaper articles. I have also consulted ABCFM annual reports from 1860–1910 to create a comprehensive database of all mission main stations and outstations contained within Ottoman Turkey. This geocoded catalogue was later incorporated into my Geographic Information Systems (GIS) dataset.

The second primary within-case method I use is internal comparison. Internal comparison involves either comparing the subcomponents of a whole with one another or comparing the whole with itself at different periods of time (Lange 2013: 58). This method is used especially in the second and third article when I show how competition affected both gender equity and development at different time intervals. Comparing the link of educational competition to these two variables over time improves the prospects of highlighting competition as a probable cause of socio-economic change.

Finally, I use GIS technology to generate data for my work. GIS can be most appropriately thought of as a "database technology" wherein each item of data is linked to a coordinate-based representation of the location that the data refer to (Gregory and Healey 2007). Whilst some components of the data are based on primary sources I have collected through archival work, the GIS also allows me to produce additional information that can be used to answer my research questions. Based on primary and secondary sources I have collected, I have managed to geocode over 1,600 schools that were operational in the late Ottoman Empire. Additionally, I have relied on historical maps to create historical administrative boundary files and have linked these polygons to both historical census information and contemporary socio-economic data.

GIS use in comparative historical research has been increasing in recent years. Yet, scholars have used this method sparingly mainly due to the enormous amount of time and energy that is involved in creating Historical GIS (HGIS) datasets (see Knowles 2016). This

is partly due to the research involved in locating historical entities. Thus, one of the most significant contributions of this present work is the creation of this new HGIS dataset. The use of this technology brings several advantages to my study. Firstly, I can use highly localized raster data — such as elevation, temperature, precipitation, luminosity, etc. — to calculate descriptive statistics for districts whose boundaries have changed over time. This method also allows me to account for the causal impact of geospatial elements such as concentration of roads or distance to trade routes on development. Finally, through this method I am able to locate places where educational institutions existed within x kilometres of each other, thereby providing me with a highly localized measure of competition.

Secondary within-case methods, "combine and synthesize the diverse evidence produced by the primary within-case methods" (Lange 2013: 42). Based on this definition, causal narrative and statistical analysis are the two secondary within-case methods used within this work. Causal narrative takes a narrative form and details the temporal ordering of events. A great deal of back and forth with historical narratives is involved in this process. This allows me to take a more holistic analytic approach that considers "context, sequence, and conjuncture." (Lange 2004: 45). This method is especially suited for analyzing complex processes involved in the institutionalization and expansion of public schooling in the Ottoman Turkey.

Statistical comparison, on the other hand, analyzes relationships between variables using a probabilistic logic and estimates causal effects. I use this method to analyze subnational variations within Ottoman Turkey over time. In Articles 2 and 3, I rely on Ordinary Least Squares (OLS) regression to estimate the relationship between multiple independent variables and my respective dependent variables. By including multiple independent variables, I am also able to test multiple competing theories simultaneously. For example, in Article 3, I am able to be take account of alternate correlates of development

such as access to water, transportation, ethnic-diversity, and other geographic elements that might put a particular region in a relatively more advantageous position for economic development. Article 1 also uses statistics, but in a much more informal manner. In this piece, I rely on descriptive statistics to highlight trends in the educational backgrounds of Armenian nationalist. This allows me to demonstrate that Armenian nationalists were rarely products of missionary schools and informs my causal narrative in the second part of this piece.

Statistics are not without their limitations. Most importantly, they fail to further our understanding of mechanisms. It is for this reason that I use qualitative and quantitative methods in a complimentary fashion throughout the dissertation, with the former focusing on causal processes and latter focusing on relationships between variables for nomothetic insight (Mahoney and Goertz 2006). The combination of evidence derived from both methods offers greater insight into my research questions. The descriptive statistics used in Article 1 allows me to discount missionary schools as an institution that was foundational in the formation of the Armenian nationalist movement. Recognizing this, I chart the modernization of Armenian education through a narrative analysis and identify the factors that were crucial its systematization and expansion. Whereas, in Article 2 and 3, I start with causal narratives to flesh out the mechanisms of educational expansion and brings out competition as an important dynamic in this process. I supplement this with statistical methods that allow me to make generalizable claims regarding the power of educational competition in Ottoman Turkey.

The dependence of comparative historical researchers on primary and secondary data sources has been criticized by some scholars. Goldthorpe (1991), in particular, suggests that researchers should avoid using historical data when contemporary data is available. Yet, this critique does not take us far when we are trying to analyze social change over a long period.

The present work analyzes the long-term consequences of public schooling in Ottoman Turkey, accordingly, my choice of data sources is partially limited by the information available to me during this initial period of educational expansion. Comparative historical researches can partially circumvent such issues by being more self-conscious about data quality and increasing the use of primary sources (Lange 2013: 172). This is one of the motivations in relying on published primary and archival sources for a significant portion of this work.

That being said, even with the use primary data, issues of data validity need to be taken seriously by comparative historical researchers. I have been conscious of this shortcoming throughout the work given the nature of my data. At certain points, I have recognized the shortcomings of the data and have tried to compensate for it through the use of additional sources. This is the case with the Ottoman Census of 1893, which was incomplete for particular Eastern Provinces. I offset the lack of data by using provincial yearbooks (*salnames*) that were compiled around the same as the 1893 Census. Furthermore, where multiple data sources existed for a particular phenomenon, I opted for the data of higher quality. This was the case with my data on Armenian schooling. I choose to use the Hrant Dink Foundations list of Armenian schooling as opposed to the 1914 Census of the Armenian Patriarchate because of the superior quality of the data.

Similarly, one must be cautious with the use of missionary sources. Missionary articles and letters were created for the purpose of consumption in their host countries. A central motivation in missionary letters was painting a picture that would increase donations from abroad. Given that they were unsuccessful in converting large numbers of Ottoman subjects, missionaries commonly relied on narratives of alternate success.

Contribution to Original Knowledge and Outline of Articles

In contrast to most existing nationalist and quantitative studies of missionaries my dissertation focuses on the interplay between missionary and local educational institutions. This focus helps me make five important contributions on the theoretical and methodological levels.

Firstly, competition was an important dynamic for the modernization and expansion of indigenous education in the Ottoman Empire. Both the Ottoman state and Armenian Patriarchate standardized their educational systems and expanded beyond the confines of the major cities in reaction Protestant missionary expansion. Although past studies have primarily identified inter-denominational competition as an important intervening factor (e.g., Gallego and Woodberry 2010), the competition between indigenous actors and missionaries has been seldom addressed in quantitative studies of missionary societies. Each of the three papers in this dissertation empirically evaluates a different consequence of this competitive relationship.

Competition is a concept seldom studied in the field of sociology.[12] Political scientists focus on political party or state-competition, economists on market competition and sport scientists on contests. When competition is studied in sociology, it is usually relegated to the realm of economic sociology. For competition to exist the good that is being competed over needs to be scarce. It is thus different from rivalry. Competition as a concept also differs from conflict, because the aim is not to destroy one's adversary. Accordingly, competition as a concept can have important implications for both political and comparative-historical

[12] A sociological analysis of competition was proposed by Charles Cooley (1930) and George Simmel (1903). More recently, neo-institutionalists have demonstrated how competitive pressures are related to legitimacy of organizations, given "organizations compete not just for resources and customers, but for political power and institutional legitimacy, for social as well as economic fitness" (DiMaggio and Powell 1983: 150).

sociology. One of the contributions of this dissertation is demonstrating how individualistic interests in a competitive educational environment can have benefits for the common good. Seeing competition as a social form allows me to identify the different consequences of this social form as they manifest in reality.

Second, using the case of Ottoman Turkey, I am able to uncouple direct missionary effects from indirect effects, thereby deepening our understanding of the mechanisms through which missionaries may have contributed to human capital. The quantitative literature on missionaries generally assumes that missionaries contributed to contemporary human capital through their educational efforts and subsequent intergenerational transmission of this capital, thereby ignoring any indirect effects resulting from competition. Using the blockage of both channels in Ottoman Turkey, I am able to isolate these indirect effects. This shows that the ways in which local communities organized to combat missionary expansion also contributed to local human capital formation. Future studies need to recognize that is also an important channel for the proliferation of human capital.

Third, this work contributes to the literature by identifying the impact of space on educational attainment across ethno-religious lines. I demonstrate how Muslims living in close proximity to an dynamic Christian schooling system stepped up their educational efforts. Article 2 shows how Christian competition impacted the Ottoman states decision to invest in female Muslim schools. Whilst, Article 3 demonstrates how historical educational competition — working through gender parity in education — can explain subnational variations in contemporary economic development. Highlighting the importance of locality in human capital spillovers reaffirms the importance of neighbourhood effects. Accounts of Ottoman interethnic relations during the long nineteenth century stress the increasing social distance between ethnic groups. Yet, the results confirm the existence of human capital spillovers despite increasing tensions between different ethno-religious groups.

Fourth, I show that historical indigenous education is an important predictor of contemporary human capital and development independent of missionary education. This has been noted in studies examining other countries, but this dissertation is the first work to empirically demonstrate the persistent inertia of Ottoman-era educational efforts. Male and female rüşdiyye schools explain non-negligible variations in contemporary subnational development. Furthermore, I show a high degree of persistence in subnational differences in the gender gap for schooling between the late Ottoman and contemporary periods. Both findings tie into the broader claim put forward in the dissertation: the importance of historical events as important determinants of current socio-economic performance. Most notably, article 2 and 3 highlight the importance of early investments in shaping long-term trajectories of educational development.

Finally, this dissertation employs the empirical methods of social science to tackle historical questions and debates within Ottoman and missionary historiography such as the influence of missionaries on Armenian nationalism and the role played by missionaries in the expansion of public education. It examines these perennial questions using state-of-the-art mixed method techniques, injecting in the process a new perspective into Ottoman historiography.

Potential Limitations

Data limitations always impose restrictions on comparative-historical works, and this work is no exception. Historical data is costly to collect and not always available. For example, in the second and third substantive paper, the lack of information on the local indicators of development prevents a precise calculation of Ottoman era economic productivity. I try to circumvent this by controlling for population density which is presumed to proxy economic development.

A second more conceptual limitation of the described analysis relates to the fact that the thesis is composed of a collection of case studies that lack a systematic comparative approach with regard to other settings. In other words, it would have been fruitful to examine and compare the reactions of indigenous groups to missionaries in different countries. For the reasons outlined in my case selection section, the dynamics identified in the dissertation are likely to only apply to non-colonized places or places with places with long-standing histories of statehood. However, this expectation has not been put under empirical scrutiny and would need further research to validate.

Moreover, it is likely that this relationship is uncommon in colonized regions with underdeveloped pre-colonial state structures. The cost-effective nature of educational outsourcing, absence of a formalized indigenous education system, and cultural affinity between missionaries and the colonial state compelled colonial administrators to entrust the bulk of educational efforts to missionaries. Colonial state also frequently limited the existence and operation of indigenous education. For these reasons colonized regions commonly lack the necessary conditions for plural and competitive educational systems.

Negative Consequences of Missionaries

The aim of this dissertation is to empirically assess how indigenous actors might have changed in the course of their interactions with missionaries; focusing on the impact of missionaries on two specific areas: Armenian nationalism and contemporary socio-economic development. It fails to find evidence supporting the views that American missionaries had a direct role to play in either process. Rather, it was competition with local institutions that played a decisive role in both. While arguing that missionary activities exerted far-reaching and unexpected social influences on Ottomans, this work avoids depicting missionary legacy as "positive" or "negative", since social realities were more complex than a dichotomous rhetoric like this can describe. This does not mean that I absolve American missionaries from any role they might have played in the ethnic violence in Eastern Anatolia. Missionaries played an active role in Islamophobic and Orientalist descriptions of the "Terrible Turk" in the nineteenth century. They popularized the plight of Christians in Western news outlets, whilst frequently failing to acknowledge similar episodes of Muslim suffering. This commonly generated a "cycle of news and repression" (Miller 2018) that ultimately fractured the Armenian community's informal status as loyal competent of the imperial regime.[13] Missionaries also facilitated the upward mobility of native Christians and inadvertently led to a class of upper-class merchants to emerge. Whilst, most of the Christian population of Eastern Anatolia lived in conditions similar to their Muslim neighbours, the increasing visibility of upper class non-Muslims played into Muslim fears over 'decline' and 'foreign meddling' at a time when the Empire was shrinking under foreign (Christian) powers'

[13] This is clearly seen in the case of the "Bulgarian Atrocities" which was popularized in Britain by the writings of missionary E. Schuyler (Karpat 1997: 353). Such depictions caused a shift in British public policy — capitalized on by the liberal party leader William Gladstone — and resulted in a more aggressive British foreign policy towards the Ottoman Empire.

intervention. This ultimately fed into Ottoman state's fears (both real and perceived) that Armenians were acting as a fifth column.

Structure of the Dissertation

The present dissertation is structured as a three-article dissertation wherein each article is a stand-alone journal article. As a collective work it engages with missionary activities in Ottoman Turkey, and zeros in on the unintended consequences of local reactions to missionaries. The three substantive articles proceed as follows. Chapter 2 engages with the oft-cited arguments in Turkish historiography that links missionary activities to Armenian nationalism. It identifies missionary-triggered competition as an important mechanism through which Armenian education was popularized and modernized. Chapters 3 and 4, use an original HGIS dataset and contribute to the quantitative literature on missionary societies. Using the unique case of Ottoman Turkey, both chapters identify reactions to missionaries as an important indirect channel of human capital proliferation. Chapter 3 examines how this historic competition popularized public female schooling across ethno-religious lines. Chapter 4, on the other hand, extends this argument and demonstrates how an improved gender parity in schooling translated into higher contemporary economic development. Finally, chapter 5 draws the main conclusions and discusses both the limitations of the study and avenues for future research.

Contribution of the Author

All three articles are sole-authored by Emre Amasyali. A version of the article "Missionary Influence and Nationalist Reactions: The Case of Armenian Ottomans" has been published in *Nationalities Papers* (2020). The "Unintended Consequences of Protestant Missionary Education in Ottoman Turkey" and "The Long Shadow of Ottoman Educational Competition" articles are currently under review at E*uropean Journal of Sociology* and *Social Science History*.

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Article 1: Missionary Influence and Nationalist Reactions: The Case of Armenian Ottomans

> In a real sense it may be said that the fomenters of political agitation in Armenia [Eastern Anatolia], as in Bulgaria, were the schoolmasters and missions, Catholic or Protestant
>
> – Sir Edwin Pears, *Forty Years in Constantinople*

> But the spirit of truth is too often akin to the spirit of revolution, and there are bonds from without as well as from within. When the scales fell from the eyes of this downtrodden people, the naked ugliness of their lot as helots was revealed.
>
> – Harry F.B. Lynch, *Armenia: Travels and Studies*

Abstract: A significant literature argues that American evangelical missionaries working in the Ottoman Empire in the nineteenth-century directly contributed to the rise of Armenian nationalism. While acknowledging that missionaries had an effect on Armenian nationalism, this article finds that the impact of missionaries on nationalism was much more unintended than is commonly assumed and resulted primarily from Armenian reactions to growing missionary influence. Employing new data on the biographies of Armenian nationalist leaders as well as comparative-historical methods, the article offers evidence that missionary influence spurred a backlash among the Armenian community that intensified preexisting local initiatives, increased investment in mass education in the provinces, and modernized its schooling system, all of which popularized and strengthened Armenian nationalism.

Keywords: Protestant missionaries; Armenians; Ottoman Empire; nationalism; education

Introduction

There has been a resurgence in social scientific analysis of missionaries over the past decade (see, Nunn 2014), and many of these analyses focus on missionary influence on nationalism. A number of studies suggest that Christian millenarian movements cultivated nationalism through the import of ideas related to the Enlightenment, citizenship, and nation-building, as found in contemporary Europe (Reid 1978; Bosch 1991; Sundkler and Steed 2000; Van der Veer 1996; Woodberry 2006; Dunch 2001). Missionaries—especially Protestants—complemented their educational initiatives by setting up religious journals and newspapers, which became key channels for the introduction of new modes of political expression and communication (Hastings 1997; Zhang 2007; Sanneh 2015; Cagé and Rueda 2016). Through this infrastructure, scholars argue that converts acquired new political and economic aspirations and were drawn to nationalist ideologies.[14]

The literature on missionary activity in the Ottoman Empire makes similar claims. Previous studies have shown that American missionaries spurred the rise of nationalism within Christian communities of the Ottoman Empire through introduction of new media

[14] For the African continent, there is evidence to support this supposed link between missionary education and (anti-colonial) nationalism. Many nationalist leaders of the decolonization period were graduates and educators of missionary schools (Maxwell 2005; Sundkler and Steed 2000). In South Africa, influential members of the African National Council (ANC)—like Nelson Mandela, Walter Sisulu, and Oliver Tambo—were all educated at missionary institutions. Many clerics in countries like Zimbabwe, South Africa, Namibia, and Zambia, were also involved in the nationalist movements in their countries. The influential work of Professor Ayankanmi Ayandele (1966) traces the origins of Nigerian nationalism to Western-educated elites and their influence—both direct and indirect—in the spread of Christianity to local communities. In Asia, there is also evidence that some of the first wave nationalists were tied to missionary education (Woodberry 2006). Sun Yatsen, the leader of the Kuatmintang and first president of the Republic of China, was educated at a British missionary medical school (Barwick 2011). In Korea, many church leaders were the driving force behind the independence movement. The church in Korea became a stronghold of the underground resistance, a key conduit for nationalist education and political efforts that challenged the Japanese rule (Grayson 2002; Lee 2000). Despite the fact that Christians accounted for only about one percent of the Korean population, roughly half of the signatories of the Korean Declaration of Independence in 1919 were Christian (Woodberry 2007).

and educational institutions as well as novel notions of self and community (Becker 2015; Fildiş 2012; Kieser 2002; Merguerian 1998; Tejirian and Simon 2014). Despite producing some valuable findings, most of these studies have examined the impact of missionaries through what they have imparted onto their target populations. Relatively little research has been carried on the agency of indigenous Christian actors and how they might have changed in the course of their interactions with missionaries.

The present article delves into the height of missionary evangelizing efforts in the Ottoman Empire and examines the consequences of American missionary proselytizing in the Armenian community. Contrary to previous research, which has primarily focused on missionary work and its direct consequences, I argue that the American missionaries fostered change by triggering a backlash amongst the Armenian Orthodox community. Specifically, I contend that educational competition between Armenian community schools and Protestant missionary schools complemented previous indigenous initiatives in education expansion. This drove the Armenian community to intensify its investment in mass education and further modernize its schooling system, especially in the Eastern Provinces. In the end, both educational expansion and educational reform played vital roles in bringing Armenian nationalism to the masses.

For evidence, I compiled an original database of prominent Armenian figures who were born in the Ottoman Empire in the late nineteenth-century. If Protestant missionary schools were intimately related to the rise of Armenian nationalism, we should expect to see a significant percentage of Armenian nationalists graduating from missionary schools. On the contrary, the data reveal that Armenian nationalists in the nineteenth-century were primarily educated in Armenian community schools, which aligns with the proposition that Armenian schools were more consequential for the development of Armenian nationalism the nineteenth-century. To further strengthen this proposition and illuminate the specific

mechanisms at play, the second portion of this article focuses on the changing nature of Armenian community schools during the second half of the nineteenth-century. Given that American missionaries were pioneers of modern education in the Ottoman Empire and engaged in a fierce competition with the local Armenian Apostolic Church at the time, special attention will be paid to the interaction between the educational efforts of both missionaries and the Armenian community.

Literature Review

A large and growing body of work in the field of economic history offers evidence that the historical presence of Christian missionaries, especially Protestant missionaries, positively influenced contemporary social and behavioral outcomes in former European colonies. Several studies have shown that missionaries contributed to increased human capital and economic prosperity by setting up schools and introducing the printing press, (Wietzke 2015; Bai and Kung 2015; Valencia Caicedo 2018; Castelló-Climent, Chaudhary, and Mukhopadhyay 2017; Michalopoulos, Putterman, and Weil 2018), expanding literacy and schooling (Bolt and Bezemer 2009; Gallego and Woodberry 2010; Mantovanelli 2014; Robert and Rachel 2017; Okoye and Pongou 2014), and spreading notions of civic engagement and democracy (Woodberry 2012; Woodberry 2006; Cagé and Rueda 2016). In most of these works, missionary activity is regarded as a direct, progressive, bottom-up form of Western institution building that undermined traditional structures.

Missionary impact on the rise of nationalist movements have been examined through a similar lens. The educational institutions and printing technologies introduced under missionaries are seen as consequential to the national consciousness of native groups. The role of the printing press or "print capitalism" in transforming notions of self and

community has been well documented (Anderson 2006; Habermas 1996). Building on the work of Benedict Anderson (2006), Adrian Hastings (1997) argues that ethnicities turned into nations when their vernacular literature moved from an oral to a widely used written form. Outside the Western world, translation of the Christian bible into vernaculars by missionaries played a crucial role this process and helped a new sense of cultural identity develop (Phipps 1972; Woodberry 2007; Pahumi 2018; Sanneh 2015). The Christian missions transformed their audiences by drawing them into the discourse of modernity—rather, "missionary modernity" (Becker 2015) or "evangelical modernity" (Makdisi 1997) —which reflected an amalgam of spreading the idea of the Gospel while advancing ideas of individualism, liberty, Enlightenment, and progress (Maxwell 2005; Ayandele 1966; Barbeau 2017; Murre-van den Berg 2006; Barwick 2011). Transmission of these ideas was further deepened through foreign language instruction, giving students access to foreign publications and newspapers (Reid 1978; Womack 2012; Woodberry 2007; Ayandele 1966).

This thinking has been extended to the Middle Eastern context, relating Arab, Assyrian, and Armenian nationalist movements to Protestant missionaries' activities (Kieser 2002; Tejirian and Simon 2014; Fildiş 2012; Zachs 2001; Smith and Kemeny 2019; Rostam-Kolayi 2008). Scholars have long debated the impact of the educational program of the Syrian missions–specifically, the American University of Beirut (AUB)—on the creation of the Arab Awakening in the Levant (Antonius 1969; Abu-Ghazaleh 1990; Tibawi 1966).[15] Many scholars today would reject the claim that missionary activities are directly linked to

[15] The sister school of American University of Beirut (AUB), the American Robert College in Istanbul, has also been frequently credited for its contribution to the Bulgarian national revival and nationalist separation movement. Central to this claim was the number of Bulgarian nationalist figures who graduated from Robert College. In the words of the former president of Robert College, the school had become a "nursery of Bulgarian statesmen" (Washburn 1913) by 1876. For a discussion of the impact of missionary activities and Robert College on Bulgarian nationalism Akca (2016), Aydın (2008), and Miller (2017).

Arabism or Arab nationalism. Even so, there is a growing understanding that missionary efforts in the region had considerable impact on the creation of the "idea of Syria," (Zachs 2001) as well as identity formation in Lebanon (Womack 2012) and Palestine (Kark 2004). In the case of the Assyrians, missionaries were central to the development of a common literary language and a modern Nestorian (or "Syrians" as they called themselves) literature (Murre-van den Berg 2009). This had the inadvertent effect of eliminating the linguistic diversity that existed between Nestorians in Persia and the Ottoman Empire. Adam Becker (2015) recently made the case that, through their attempts at reforming the Nestorian community, the American missionaries contributed to the development of a national consciousness among East Syrians.

Perhaps the most controversial claim about missionary influence on nationalism in the region is that Protestant missionaries were crucial for the development of Armenian nationalism. Missionary efforts—especially after 1856—were mainly focused on the Armenian community in the Ottoman Empire. The Armenian nationalist movement started crystalizing in the late nineteenth century, with the first Armenian nationalist party—the Armenakan Party—opening in the Eastern Ottoman province of Van in 1885. This period also coincides with the height of American missionary activity, particularly in the troubled eastern Anatolian regions bordering the Russian Empire and Qajar Dynasty. The Ottoman state, under the rule of Sultan Abdülhamid (1876–1909), regarded the American missionary schools as a threat and expended significant efforts to control them, even closing missionary schools on grounds of sedition (Şahin 2011; Deringil 1998; Abdülhamid 2010). American missionaries' direct role in the formation of Armenian nationalism is attested in the literature. These distinct, yet at times overlapping, arguments straddle three categories: those that focus on (1) ethnic segmentation, (2) the content of education, and (3) the use of vernacular languages.

Ethnic Segmentation and Alienation

The educational system developed by American missionaries often catered to the Christian communities of the Ottoman Empire, with the inadvertent effect of crystallizing ethnic segmentation (Göçek 1993; Barkey 2008: 287). Scholars studying education and ethnic violence have noted that ethnic segregation can amplify social distance between communities, and can, in some instances, lead to nationalist violence (Lange 2012). Adding to the sense of detachment among students was the general absence of Turkish and even Ottoman cultural influences from the curricula of American schools (Berkes 1998: 192). The exposure of the Armenian population to Western education and culture had the further effect of sharpening existing differences between Armenians and Muslims, alienating Armenians from the local culture (Alan 2008; Badr 2000; Göçek 1993; Zeytinoğlu, Bonnabeau, and Eşkinat 2012; Grabill 1971). The most extreme variant of this argument claims that missionaries instilled among Armenians a hatred for the Turkish race, nation and Ottoman state. The schools established by missionaries fostered an American and Christian admiration, in turn leading the students to perceive themselves and their community as distinct from and superior to the Turkish nation and Ottoman state (Tanyu 1978; McCarthy and McCarthy 1989; Küçük 2009).

Content of Education

The second stream of scholarship focuses more exclusively on educational content. Theologically, the missionary movement was rooted in a democratic ethos of individualism, urging students to question all forms of authority (Merguerian 2006; Moranian 1994: 79–82). By this thinking, these novel ideas "provided a cultural model and forum through which the Armenians could ascertain their national consciousness" (Fildiş 2012: 741). The Protestant

principles of sola scriptura and salvation by grace declares individual judgement as supreme. Kedourie (1984) argues that both principles aided the growth of Armenian nationalism, as converts began to interpret salvation by grace as an instrument for building their own heaven on earth.[16] The molding of a modern sense of Armenian national identity out of the European model in turn gave way to radical polarization (Levene 2005: 319; Fildiş 2012).

It is further argued that the curricula at missionary schools strengthened students' ethnic identities. Students at American missionary schools were commonly led through teachings on their language, history, and literature (Berkes 1998: 192).[17] These classes idealized and mythologized their ancient past as well as equipping students with a common language through which to conceptualize their community as a cohesive whole (Kocabaşoğlu 2000). Beyond articulating a collective identity, scholars argue that these classes were also foundational in nourishing nationalist feelings (Sezer 2010; Küçük 2009; Dingeç 2009: 39-40; Fildiş 2012; Aydın 2008; Güçlü 2018). Thus, upon graduation, as one author puts it, students were "primed and ready to becoming Hunchakists"[18] (Aydın 2008: 167).

The Use of the Vernacular

While the "Armenian renaissance"—also known as the Zartonk—was arguably well underway when the American missionaries arrived in the Ottoman Empire in the early

[16] Kedourie's interpretation is reminiscent of Eric Voegelin's definition of nationalism as "intramundane eschatology." In *The New Science of Politics, Order and History, and Science, Politics and Gnosticism,* Voegelin argues that modern nationalism emerges out of urban heretical movements of the Middle Ages. The current that connects both is the intent to bring about the pure and perfect realm of God by human means.

[17] Aydın (2008) for example quotes a visit of a Russian colonel who published a report upon inspecting the American missionary schools in Anatolia. According to this report, these schools were teaching Armenian, providing Armenian authors' books, and making reference to the independent Armenian Kingdom.

[18] The Hunchak Party or Social Democrat Hunchakian Party, was a revolutionary Armenian nationalist party founded by Russian Armenians studying in Geneva in 1887.

nineteenth-century (Artinian 1988), a third area of scholarship contends that the activities of the missionaries accelerated the speed and intensity of previous local initiatives. Central to missionary efforts aiding the cultural renaissance was the use and codification of the vernacular Armenian language, which allowed for collective identity to be articulated anew. Prior to the arrival of American missionaries, the language of the Church (grabar) was divorced from the vernacular of the Armenian people (ashkhahrhabar) (Riggs 1858). Elias Riggs, part of the first generation of missionaries in the Ottoman Empire, wrote a vernacular grammar book to spread the use of Armenian amongst millet members who spoke only Turkish (Shaw and Shaw 2002: 126). The missionaries further aided the standardization of spoken language through their translations of the Bible and distribution of other texts (Nalbandian 1963: 49). Thus, by this thinking, the missionaries' advocacy for the use of the vernacular Armenian language created a new kind of unity and was integral to the growth of Armenian national awakening (Merguerian 2006; Merguerian 1998; Kieser 2002; Kieser 2005; Badr 2000; Arkun 2005; Güçlü 2018; Doğan 2013; Shaw and Shaw 2002: 126; Grabill 1971).[19]

What is Missing from this Analysis?

Absent from these accounts of missionary influence in the formation of Armenian nationalism are the patterns of competition and emulation noted in studies on missionary influence in other parts of the world (ex., Gallego and Woodberry 2010; Trejo 2009). Unlike in the continent of Africa, conversion to Protestantism was far less common in Asia and the Middle East.[20] The existence of state-sponsored world religions in these regions was often a

[19] The vernacular Armenian language was distinct from the classical tongue. Classical Armenian was used in the church and understood only by a small number of educated clergy.
[20] According to one author, the Protestant millet in the Ottoman Empire had only 36,268 members in 1893 (Mutlu 2005: 309). Considering that some sources number the Armenian

barrier to missionaries' influence on local populations (Tapp 1989). Even where the Protestants found a receptive minority, conflict was common, as traditional elites often resisted and worked to counteract the proselytizing efforts of missionaries. In such cases, the influence of Christian missionary work through example was as important as the dissemination of Christian ideas. The educational, voluntary, and political organizations established by the Protestants encouraged other communities to form their own organizations (Deol 2000; Dunch 2001; Sharkey 2013; Kang 1997; Jung 2020).[21]

Most research on missionary societies in places with centralized religious authorities have identified competition and emulation as two important pathways for social change. Surprisingly, the effects of these two variables on the Armenian community have not been closely examined. The impact of missionary activities on Armenian nationalism has mostly been evaluated through the prism of direct influences, such as ethnic segmentation, socialization through education, or the dissemination of the printing press. We should also expect the influence of missionaries to work indirectly, through processes of competition and emulation. Confirming these expectations is the fierce competition that took place between the Armenian Apostolic Church in the Ottoman Empire and the American Protestant missionaries during the nineteenth-century. The Armenian church experienced a sense of existential threat as a result of the activities of the American missionaries, and it took active measures to preserve the unity of their millet. Thus, as with other groups targeted by missionaries, the Armenian community in the Ottoman Empire may have responded to this outside influence by emulating missionary initiatives.

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population at 1 million (Karpat 1985), this equates to around only 3 percent of the total Armenian population.

[21] A similar argument is made by Trejo (2009), who argues that a country's "religious market structure" – i.e. the competition between different religious communities – impacts the religious communities' investment in the creation of the social bases for indigenous ethnic mobilization.

Methodology and Data

The first section of this article presents an original dataset of major Armenian nationalist figures and their educational backgrounds. These biographies lend insight into whether Armenian schools or Protestant missionary schools produced more figures for the Armenian nationalist movement. The data provides ample evidence that major Armenian nationalists were overwhelmingly educated in Armenian community schools, not Protestant missionary schools. Given this, one would expect Armenian community schools to be more consequential for the rise of Armenian nationalism. Probing this hypothesis, I use a detailed case study to explore the changing character of Armenian education in the nineteenth-century.

The second section of the article relies on comparative-historical methods to explore whether the proposed sequence of competition and emulation noted in other regions of the world helps explain the statistical composition of the elites in my sample. To test whether missionary influence on Armenian nationalism was indirect, rather than direct, this article uses comparative historical methods: causal narrative and pattern-matching (Lange 2013; Mahoney 2000; Mahoney 2000). The causal narrative explores a specific phenomenon through a narrative analysis while pattern-matching investigates whether the pattern in a case matches the pattern predicted by theory.

This article primarily relies on two archives: English sources drawn from the Archives of the American Board of Commissioners for Foreign Missions at Houghton Library and Ottoman Turkish sources from the Türkiye Cumhuriyeti Cumhurbaşkanlığı Devlet Arşivleri Başkanlığı (Turkish Presidency State Archives of the Republic of Turkey). Various documents are reviewed: official reports, educational statistics, correspondence between the provincial government and the Porte, meeting reports, letters to friends and relatives, diaries,

and the American Board's periodical *The Missionary Herald* (published in Boston). Other primary sources include lectures, diaries, travelogues, and newspaper articles.

Dataset of Armenian Nationalists

Description of Sample

If missionary schools directly influenced the rise of an Armenian nationalist movement, one would expect to find that graduates of missionary schools played an influential role in the Armenian ethno-nationalist movement. In order to test this hypothesis, I collected a sample of 90 individuals active in the Armenian nationalist movement at the end of the nineteenth-century. The data is sourced from memoirs, secondary literature, and an Armenian biographical encyclopedia *Who is Who?* (Ayvazyan 2005). For the purposes of this study, a nationalist is someone who at some point in their life supported the idea of an independent Armenian nation-state in the Eastern provinces of the Ottoman Empire. Furthermore, this person should have been active (either born, educated, or lived) within the boundaries of the Ottoman Empire in the second half of the nineteenth-century for them to be considered as part of the sample.

Without a sample of the whole corps of nationalists, this study opens itself to the criticism of generalizing based on particular sub-groups or using a few biographies in order to generalize about the whole population. To partially circumvent these issues, I employed purposeful sampling, wherein I focus on known members of the three political nationalist movements active in the Ottoman Empire in the nineteenth-century: the Armenakan Party (13 individuals), the Armenian Revolutionary Federation (ARF) (35 individuals) and the Social Democrat Hunchakian Party (SDHP) (12 individuals). I complemented this list with Armenian deputies of the Ottoman Parliament and prominent nonpartisan figures of the Armenian national movement. The total number of nationalists within my sample is 90 individuals. Included in the sample are top figures of the Armenian political movement within the Ottoman Empire: the Young Armenians, Ottoman bureaucrats, revolutionary

party members, journalists, writers, and artists. For each individual, I collected data on place and date of birth, educational history, and role in the nationalist movement. Because of historical circumstance, the data is complete for some individuals but sparse for others.[22]

Results

Of those sampled, 39 percent were born in Anatolia, 30 percent in Istanbul, 27.5 percent in the Russian Empire, and 3 percent in Qajar Iran. Given that all of those included in the sample were active in the Ottoman Empire at some point, this distribution reflects the porous nature of imperial borders in Eastern Anatolia. Many young Armenians from the Russian Empire and the Ottoman capital travelled to Eastern Anatolia to aid the cause of Western Armenia as fighters, teachers, and activists. Among the pre-tertiary educational institutions catalogued, 28 percent were located in Anatolia, 27 percent in the Russian Empire, and 45 percent in Istanbul. While 30 percent were born in Istanbul, 45 percent of the total sample attended a school in the city. However, when restricted to only the first educational institution attended, the percentage of schools for Anatolia rises to 30 percent while Istanbul's share drops to 37 percent. Many individuals appear to have sought higher education in the capital, a natural outgrowth of Istanbul's status as an intellectual hub for the Armenian community.

Armenian educational institutions, such as the Nersesian Academy in Tbilisi (8 individuals), the Gevorgian Seminary in Etchmiadzin (10 individuals), the Getronagan High School (5 individuals), and the Berberian School (6 individuals) in Istanbul, were important centers of learning that produced many of the leading cadres of the Armenian nationalist movement. Together they account for 36 percent of the total sample. Similarly, of the 47.5

[22] See Table A.1 in the Appendix for a full list of individuals included in the sample.

percent who attended universities, many sought higher education abroad: 57 percent in Western Europe, 26 percent in Russia, and 6 percent in Istanbul.

The most significant finding to emerge from this data is that a majority (80 percent) graduated from Armenian schools. The leading school classification after Armenian schools is Russian state schools at 11 percent. Only 2 percent of the total sample (2 individuals) attended Protestant missionary schools. The two individuals who are coded as attending Protestant schools are Soghomon Tehlirian and Hakop Ter-Hakobian; both were members of the ARF and were involved in assassination attempts against Ottoman officials alleged to have been complicit in the Armenian Genocide. In both cases, their attendance at Protestant schools was short-lived, followed by further education in Armenian high schools. Soghomon continued his studies at the prestigious Getronagan High School in Istanbul after receiving his elementary education at a local Protestant school. Hakop left Euphrates College after one year and transferred to the Berberian School in Istanbul.

Two central findings emerge here. First, the growth of the Armenian nationalist movement in the Ottoman Empire was not an isolated phenomenon: it was heavily influenced by the intellectual climate in the Russian Empire and integrally connected to institutions of higher learning in the West. These insights are supported by existing literature (e.g. Nalbandian 1963; Reynolds 2011; Tejirian and Simon 2014); however, my dataset lends empirical backing. Secondly, an overwhelming majority of Armenian nationalist figures emerged from Armenian schools rather than American missionary schools. This suggests that the Armenian educational system was more consequential for students' absorption into the Armenian nationalist movement than for those in missionary schools.

Given these findings, the next section of the article will employ comparative-historical methods to trace whether the proposed sequence of emulation observed in other regions of the world can help explain the statistical composition of elites in the present

sample. This approach will be rooted in a causal narrative of the development of Armenian community relations in the nineteenth-century, focusing on community-led reform initiatives in education and their interactions with newly arrived American missionaries.

The History of Armenian Educational Reform

The Armenian community in the Ottoman Empire did not have a formalized schooling system prior to the eighteenth-century. Education during this period was mainly confined to the private initiatives of teachers or religious leaders (Bebiroğlu 2003; Barnum 1893). However, there were notable attempts at educational reform prior to missionary intervention, such as Jesuit missions operating in the region in the seventeenth-century and the contributions of the Armenian community in Madras, India, to printing technologies and literature (Zekiyan 2001). The most important endogenous contribution to Armenian enlightenment during this period came from the Catholic Mekitharist monasteries. The Mekitharists's monasteries, named after Mekithar of Sebaste (1676–1749), played an important role in creating centers of learning that stressed the use of the common speech over classical Armenian—an influence extending well beyond the confines of sectarian identity to influence all Armenians (Levon Zekiyan, pers. comm.).

It was not until 1790, forty years before the missionaries built a station and school, that the Ottoman sultan permitted the establishment of schools for Christians.[23] Many Armenian schools, funded by powerful Armenian notables known as amiras, were set up in Istanbul after this period. At the time, the progressive and conservative amiras were engulfed in a power struggle over the control of the Armenian Patriarchate.[24] Adding to these changing circumstances was Ottoman Armenians' increased contact with the West, especially through trade.[25] As a result, many young elite Armenians began seeking education in Europe

[23] The first official Armenian School was set up in 1790 by Şnork Mıgırdıç and Amira Miricanyan in Kumkapi Langa (Bebiroğlu 2003: 20).
[24] The *sarraf-amiras* were composed of bankers, merchants, and money-lenders, and, given their dominant position in society, they were interested in preserving the status quo. The *technocrat-amiras*, on the other hand, held official Ottoman posts and were interested in curtailing the power of the *sarrafs*. They were commonly supporters of reform (Barsoumian 1982).
[25] The diasporic connections of the Armenians extended well beyond the eighteenth-century and did not only look toward the West (Levon Zekiyan, pers. comm.)

in the late eighteenth-century (Artinian 1988). These individuals—commonly referred to as Young Armenians—allied themselves with progressive amiras in the community and were pivotal in reforming education amongst Armenians in the Ottoman Empire. Many were members of the Educational Council (1853), founded by the Patriarchate. A large contingent also founded independent civil and secular educational societies committed to reform during this period (e.g., the Araratian Society).

Thus, the American missionaries started engaging with the Armenian community in the Ottoman Empire at a time of profound change in the structure of the Armenian community. The first generation of the American Board of Commissioners for Foreign Missions (ABCFM) missionaries who arrived in the Ottoman Empire in the 1820s restricted their organizational efforts to Bible reading groups.[26] Later, when confronted with the mass illiteracy within Ottoman society, the Protestant missionary organization also began building churches, Sunday schools, and educational institutions. The initial efforts of the ABCFM in the Ottoman Empire were focused on the Jewish, Greek, and Muslim populations of the empire.[27] However, when these efforts did not produce the desired results, in 1856 the missionaries decided to turn the bulk of their attention to the Gregorian Armenians.

The initial reception of missionaries by the Armenian Church was amicable (Chopourian 1972: 63). The missionaries were equally positive and described their relations with the Armenian Church as possessing a "pleasing character" (ABCFM 1836). During this initial period of contact, the missionaries were cautious, avoiding more aggressive and divisive efforts, such as erecting schools and assembling separate congregations (Barton

[26] The first missionary school in the Ottoman Empire was opened in 1834 in Bursa (Somel 2002: 396).
[27] Missionaries soon discovered that preaching to Muslims with the idea of converting them was impossible and that such action would eventually be punished by Muslim authorities (Tibawi 1966: 171).

1908: 157-58; Riggs 1948: 10). However, emergent relationships with the more progressive elements of the Armenian community, who welcomed ecclesiastical reform, drew scorn from the Armenian Church (Barton 1908: 161–62). The relationship between the Gregorian Church and the missionaries suffered especially in 1839, when the Armenian Patriarch began persecuting converts to Protestantism (Anderson 1872: 114). This period was followed by a second bull of excommunication and anathema by Patriarch Matteos, who barred all Protestants from membership in the Gregorian Church (Apree 1936: 152).[28] Printed copies of the two anathemas were disseminated widely across Turkey, to be read in all churches (Dwight 1854: 245). As a result, Orthodox Armenians were forbidden to have social and business dealings with the Protestants, and the newly excommunicated evangelical Armenians lost all existing civil rights that they had possessed within the Empire.

The persecution of the nascent Protestant community prompted the creation of an official Protestant Church—and in 1850, under the pressure of the British Consulate on Ottoman bureaucrats, a new Protestant millet was approved (Kieser 2005: 121). The Armenian millet was thus separated into Gregorian, Catholic, and Protestant denominations.[29] The Tanzimat reforms served to institutionalize the formerly informal millet system and stipulated greater secular input into the governance of the millets. In the contest between the conservative and reformist groups within the Gregorian Armenian millet, the changing environment tipped the scale in favor of the reformist faction. This manifested itself in the official ratification of the Armenian National Constitution (*Azgayin*

[28] The bull also banned publications of Protestants and contact with Protestants including business and marriage, and attendance of schools.

[29] In 1831, Sultan Mahmud II recognized the Catholic Armenian community as a separate millet through an imperial edict (Beydilli 1995). Catholic missionary activities in the Ottoman Empire date back to the early-seventeenth-century. The Armenian Church's response to Latin missionary activities were largely similar to the processes described in this paper. In reaction to growing influence of Catholicism, Patriarch John Golod (1715–41) stepped up educational efforts and opened the first Armenian seminary in Scutari (Üsküdar) in 1715 (Sarafian 1930: 142–43).

Sahmanadrut'iwun Hayoc) or The Regulation of the Armenian Patriarchate (*Ermeni Patrikliği Nizamatı*) in 1863. The Istanbul Patriarchate had gradually expanded its influence over the Armenians living in the Ottoman Empire in the eighteenth and nineteenth centuries.[30] The new constitution further consolidated this process, aiming to centralize political administration, jurisdiction, and education under the patriarchs' authority (Antaramian 2014; Young 2001).

The Young Armenians, the Tanzimat reforms, and the clash between conservatives and reformists were all important factors to animate Armenian nationalism. While these developments were pivotal in the evolution of the Armenian educational system and the formation of a national identity, the intellectual growth experienced by the Ottoman Armenian community in the eighteenth and early nineteenth centuries was largely confined to elite and middle-class circles in Istanbul and other major Western Ottoman cities (Harris 1999: 125-26; Suny 2001: 18-19). The economic and ideological changes experienced by some Armenians in the West did not match the experiences of the majority of Armenians living in the Eastern provinces. The Anatolian Armenian peasantry, which constituted an overwhelming majority of the Armenian population, had little understanding of the nationalist ideals being brought to fruition and tended to more readily identify with their locality, clan, or kinship. Faced with an illiterate peasant society without a universal educational system or standardized vernacular, any effort toward nationalization of the masses was limited.[31] This article argues that one crucial neglected factor that propelled the

[30] Prior to the Tanzimat period, the Anatolian Armenians were under the influence of three separate Catholicos and Patriarch authorities: Etchmiadzin, Sis, and Istanbul. The Istanbul Patriarchate held a special position given that it was the intermediary between Etchmiadzin and the Porte. It also expanded its influence in the eighteenth and nineteenth centuries (Bardakjian 1982).

[31] Recent scholarship has found that nationalism played a marginal role in nineteenth-century rebellions in the Ottoman Empire. Nationalism played a marginal role in both the Greek War of Independence and the Balkan Uprisings (e.g., the First and Second Serbian Uprisings, Hadži Prodan's Revolt, and the Wallachian and Cretan insurrections) (Malešević 2013; Jelavich 1983;

Armenian community to invest in mass education and modernize its schooling system was the competition the Armenian church received from the American Protestant missionaries.

Evangelicalism was a significant challenge for the Gregorian Church. Ideological differences between the two camps (Chopourian 1972) as well as subtraction of tax-paying members of the Gregorian community (Davison 1973: 118), created significant problems for the Armenian Church. The Protestant challenge also undermined the unifying power of the church (Kassouny 1931: 25; Richter 1910: 112) and thus disrupted the overlap between race and religion that existed in the Ottoman Empire. Protestants were frequently accused of disloyalty to the Armenian race (Berberian 2000: 78-79). This generated intense debate within the Armenian community in the second half of the nineteenth-century regarding notions of Armenian belonging. Beginning in the 1850s,[32] catalogues of this debate can be found in Armenian newspapers (Koçunyan 2014: 198), official reports such as *takrirs* (Ueno 2013), and Ottoman Archives (Karacakaya and Turkey. 2007).[33]

Karpat 1997).

[32] The 1856 Reform Edict brought freedom of conscience to all subjects of the empire. This had the inadvertent effect of making the Armenian community more vulnerable to missionary propoganda.

[33] Y.A. HUS, 333/104 [1895]; HR.MKT, 4/18 – 1843; HR. SYS, 51/29 – 1868; HR. SYS, 2812/2; A. MKT. MHM, 702/19.

Competition and Educational Reform

The challenge that the Evangelicals posed against the old church and the eventual split of the Protestant community created an environment of ecclesiastical and educational competition. This competitive spirit was most acutely realized in the six Eastern Anatolian *vilayets* (provinces) where the largest communities of Armenians existed: Van, Bitlis, Erzurum, Diyarbakır, Sivas, and Mamuret-ül-Aziz. The interior provinces of Anatolia offered a promising target for the Protestant missionaries and their proselytizing efforts (Smith and Dwight 1834). They established a missionary station in the province of Trabzon as early as 1835, making significant inroads in the Eastern vilayets, especially after the official recognition of the Protestants as a community in 1850. With impetus from the constitutional movement, this period also coincided with the Armenian Church's increased engagement in the peripheral zones as it worked to consolidate its hold over Eastern Armenians. Education held a special place for both parties' projects, viewed as a source of both "rescue and redemption" for the Anatolian Armenians (Low 2015; Sarafian 1930: 216). Thus, a common target population as well as diverging ecclesiastical traditions between the Protestants and the Armenian Church, invited natural conflict.

The Rivalry in the East

Attempts to reform education within the Armenian community stemmed from both a positive desire for change and a defensive reaction to external challenges.[34] Part of the change in the quality and quantity of schools after the mid-nineteenth-century can be

[34] Another central concern for the Armenian Patriarchate was the assimilation of a segment of the Ottoman Armenian community, particularly in regions like Antakya, Antep, Maraş region where many Armenians did not form a majority and spoke the language that was predominant in the region. This sociodemographic reality made the missionary challenge even more urgent.

explained by the initiatives of the Educational Commission, which was established under the reforming Armenian Patriarchate (Matossian 2013: 202; Young 2001). What I argue here, however, is that a neglected impetus for change was competition with the Evangelicals. What the educational mission meant for both sides, and the competition that accompanied it, is best communicated by the language preference. For many reformist Armenians, education was equated to salvation (Sarafian 1930: 216; Cowe 2003: 35). Many of the pivotal figures of the Armenian community who spearheaded the cause of mass-education like Raffi, Mkrtitch Khrimian[35], Garegin Srvantsiants, and Telgadintsi[36] —were also vocal opponents of missionary activities (Kostandyan 2000: 61; Berberian 2000; Derderian 2014; Dennis 2015; Cowe 2003). In this context of community division, education was seen as a pivotal socializing force (Dennis 2015: 258).

Armenian schools were, in turn, frequently perceived by the missionaries as "established in imitation or rivalry" (ABCFM 1869: 6). At the same time, education for the missionaries was the "battering ram to knock the wall that surrounds the old Armenian Church",[37] "a race" (Barnum 1890), or "a case of the survival of the fittest".[38] Given that both the Gregorian schools and the Protestant schools were targeting a common base, the success of one side was frequently perceived as the failure of the other. Exemplifying this

[35] Mkrtitch Khrimian, also known as Khrimian Hayrik (Father), was a priest and educator from Van who served as the Armenian Patriarch of Constantinople (1869–73) and Catholicos of All Armenians (1893–1907). Khrimian wrote a pamphlet in 1851 entitled "Against Papacy" in which he criticized the Catholic Church and cautioned Armenians against conversion.
[36] Telgadintsi's stories featured realist descriptions of rural Armenian life and commonly featured American Protestants as symbols of hypocrisy and moral decay in the Harput community (Cowe 2003). Telgadintsi's satirical short story "Ēmilē: Amerigatsʻi Misionaruhii Dibar Mĕ" (Emily: A Model American Missionary) is characteristic of such uncomplimentary depictions. Telgadintsi became the director of the Getronagan Varjaran (National Central School) in Harput in 1887 and was pivotal in reforming the newfound school so that it could compete with the neighbouring missionary school, Euphrates College (Sipahi 2015: 286).
[37] Barton, James L. 1889. "James Barton to Judson Smith." ABC 11.4 (1.1): 326–32.
[38] Barton, James L. 1891. "James Barton to Judson Smith." American Board of Commissioners for Foreign Missions Archives ABC 11.4 (1.1): 326–32.

point, one missionary from Van writes: "Armenian schools, such as they are, are not lacking, and one or two of them are of a tolerably high order. All the influence of the ecclesiastics is thrown in favor of their school against ours. These efforts were so successful, that our school opened last fall with only twenty to twenty-five pupils" (ABCFM 1883).

The reverse also held true: missionaries pressed their central offices for the establishment of "schools of a thoroughly evangelical character" to "counteract" the influence of Armenian schools (Barnum 1887: 515). They also saw the growing surveillance over Armenian schools and the curtailment of their activities during the reign of Abdülhamid II as an opportunity for increased recruitment to their own schools (Cole 1893: 356).

When the rivalry between both parties was expressed in more subdued language, the missionaries often spoke of the Protestant schools producing a "great impulse" (Melcon 1903: 15), a "widespread thirst," or the "desire of education increasing and becoming better appreciated"[39] among native Armenians because of missionary efforts. According to a wealthy Armenian of Sivas in conversation with a missionary about the value of education, said, "You showed us a picture, and looking upon it we began to see that it was very beautiful, whereupon we took it to our bosoms, and have been cherishing it since" (ABCFM 1880: 353). The result of this realization was the number of Gregorian schools in the region increasing from four to thirteen and girls' schools from zero to three. By the end of the century, the Gregorian community in the Sivas region would have 30 mixed elementary schools, four middle schools for boys, one middle school for girls, and one secondary school (Birbudak 2007).

[39] Barnum, Herman N. 1879. "Barnum, H. N. (E. Turkey, 1858–1905)." American Board of Commissioners for Foreign Missions Archives ABC 66.

Opening New Schools

The missionaries viewed their schools as a stimulus for Armenians to launch their own schools (Barnum 1892: 146; Barnum 1893: 298) and, in some cases, even as being "duplicated by the Gregorian Armenians" (Bliss 1896: 316). A missionary stationed in Harput in the late nineteenth-century (modern day Elazığ), James L. Barton observed that "if there are no Protestants, there is no school of any kind … [Yet] wherever [Protestants] open a school, an opposition institution springs up."[40] The Protestants were, of course, not the first purveyors of education in the provinces.

Prior to the arrival of missionaries, the Anatolian provinces hosted a small number of Armenian schools. According to a survey conducted by the Armenian Patriarchate in 1834, there were 120 Armenian elementary schools in various parts of Anatolia (Ergin 1977: 753). However, only after the establishment of missionary schools in the provinces do we observe the Armenian Church expanding its educational efforts beyond the confines of large metropolises, such that the number of Armenian schools in the provinces had more than quadrupled by the 1870s (Young 2001: 97).

The provincial Ottoman yearbooks (*salnames*) of the Eastern vilayets also show that the building of Gregorian schools accelerated substantially after the arrival of missionaries. For example, before the establishment of the missionary station in the Province of Mamuret-ül-Aziz in 1856, there were four Gregorian secondary schools. The later establishment of the missionary center and the subsequent discovery of so-called "common schools" in neighboring towns "stimulated the Armenians to establish still a greater number" of schools (Barnum 1893). The Ottoman yearbook statistics reveal that Protestant and

[40] Barton, James L. 1891. "James Barton to Judson Smith." American Board of Commissioners for Foreign Missions Archives ABC 11.4 (1.1): 326–32.

Gregorian schools were frequently established in the same year or in quick succession of one another (Taşkın 2013). On a visit to a village just south of Harput, Perchenj (modern-day Akçakiraz), Barton provides a first-hand account of the trends in the Ottoman yearbook statistics, cataloguing the succession of events that unfolded in the struggle between Protestants and Gregorians there. He notes that when the missionaries first arrived, the "interest in education increased" so that "boys were drawn from the old church." This, in turn, "aroused an opposition" among local Armenians, prompting the Gregorian Church to "[secure] a teacher and [open] a school." Protestants attempted to make their school more attractive through the construction of a new school house, an effort which the Gregorians then replicated.[41]

Reflected in both macro figures and mission reports, other regions have produced similar patterns. Protestant missionaries frequently reported the opening of "a competing school" by Gregorians, following the establishment their own schools.[42] An 1876 survey conducted by the local Ottoman government in Yozgat noted only one Armenian school in the region. When the famous French geographer and statistician Vital Cuinet passed through the same region 14 years later, he recorded 31 Armenian schools and five Protestant schools (Cuinet 1891). Missionaries introduced their first school into the Sanjak of Adana in 1883, at which point only one Armenian high school existed in the whole province. In turn, during the period following missionary intervention, five Armenian schools were established. In Muş, the same pattern unfolds: a decade after the Knapp family of the ABCFM started operating in the region in the 1860s, the Istanbul-based Armenian United Society launched its own programming (Miller 2015: 354).

[41] Barnum, Herman N. 1891. "Barnum, H. N. (E. Turkey, 1858-1905)." American Board of Commissioners for Foreign Missions Archives ABC 66.
[42] Sanders, C.S. 1887. "Report of Aintab Station for the Year Ending May 25, 1887." ABC 16.9.5 (6): 326–32.

Copying Schools

The influence of American missionary schools on the Armenian community was not simply restricted to the reactive introduction of new schools. Community-led reforms extended into changing the very character of Armenian schools (Chopourian 1972: 126; Alan 2008: 388). Missionary schools were amongst the first purveyors of modern education in the Ottoman Empire and introduced innovations, such as modern curricula, science laboratories, programs for girls, coeducation, kindergartens, and farm schools.[43] They were also pivotal in introducing technological advancements—such as textbooks, blackboards, reading cards, desks, and chairs—into Ottoman classrooms. The Protestant schools "served as a model" (Barnum 1892: 146)—a "stimulus to […] reform their own schools."[44] Thus, in order to keep Gregorian pupils out of the Protestant schools, observers note the Gregorian community expended "great effort to make their schools equal or even better than those of the mission" (Richter 1910: 159). Primary areas of influence included the adoption of new teaching methods, the recruitment of missionary school graduates, the use of textbooks, and the advancement of education for girls.

Quality

The missionaries frequently lamented the poor quality of education among Armenians prior to their arrival, even commenting that preexisting schools had "no lessons, no suitable books, no master" (ABCFM 1832). In an article on public instruction in the

[43] Modern school systems are characterized by: 1) a more or less differentiated school system with subdivision into classes, levels, types, and graduate qualifications, 2) teaching according to a prearranged curriculum, 3) a systemic differentiation between teaching and learning, and 4) a state-controlled, public, legal regulation of educational practice in schools (Adick 1992).
[44] Barnum, Herman N. 1879. "Barnum, H. N. (E. Turkey, 1858–1905)." American Board of Commissioners for Foreign Missions Archives ABC 66.

Ottoman Empire written 35 years after this observation, Hyde Clarke (1867: 524), noted that the improved quality of education in Armenian schools was an outgrowth of the Protestant method. The first discernable impact that missionaries had on Armenian curricula was the spread of the Lancaster method of education (Aksu 2008). Relying on a practice of peer-teaching, this method was a resourceful and cost-effective tool for teaching large groups of students. In order to aid the adoption of the Lancaster method, first generation missionary Harrison G.O. Dwight expended great effort into creating modern Armenian reading cards and textbooks for Armenian schools (Aksu 2008). Though the Lancaster method is described as having been unsuccessful among the Armenians (Stone 2002), there is evidence that this method of teaching was used in the Armenian national schools up until the early-twentieth-century (Shemmassian 1996).

Prior to the arrival of missionaries in the provinces, the most common educational institutions were parish schools connected by churches. Most of these schools were characterized by newly arrived missionaries as "primitive and non-pedagogical" (Pilibbosian 1942) in nature, where "the priests taught a few boys to read at church services and few learned to write" (Barnum 1893). Thus, the emphases on math, natural sciences, languages, Bible study, and practical skills in Protestant missionary schools were noteworthy innovations (Marden 1880). For example, the Central School (founded in the 1820s), one of the oldest schools in Harput, was characteristic of these early parish schools for its first 60 years. The arrival of American missionaries onto the Harput educational scene encouraged the Armenian Church to "develop further its own educational schools and a central high school" (Hovannisian 2002: 3). Therefore, in 1887 a new school was founded on the land belonging to the old central school. Hovhannes Harutiunian (Telgadintsi), one of the foundational figures of Western Armenian literature and a graduate of the Smpadian School in Harput, was appointed as its director. He carried the philosophy of his alma mater, which prioritized

"modern pedagogical methods" (Tachjian 2012) and updated the old school with modern equipment (desks, classrooms, chairs, etc.) such that the new Central School "began to compete with the American Euphrates college" (Beledian 2002: 246). It is also during this period that the Central School began to teach math, geography, French, Turkish, and English (Haig 1959: 402-08). By the end of the nineteenth-century, the educational landscape of Harput was completely altered so that the Armenians had "a school system from the kindergarten to the college, with well trained teachers for both sexes" (Barnum 1899).

Textbooks and Graduates

Male and female graduates of missionary schools were in high demand as teachers for Armenian schools (Barnum, 1890, #559). There is much evidence that the graduates of the missionary schools taught at Gregorian schools (Barnum 1890: 212; Stone 2002; Dwight, Tupper, and Bliss 1904: 757). The migration of missionary school graduates into community schools was naturally accompanied by the teaching techniques used in missionary schools. Missionaries viewed this trend optimistically, preferring the placement of missionary school graduates in Armenian schools over what they perceived as management "in the hand of infidel teachers" (Union 1882).

The hiring of Protestant school graduates was accompanied by the use of schoolbooks printed at the Protestant missionary press (Marden 1880). Before the institution of Protestant missions, schoolbooks were not widely used in the Ottoman Empire. Moreover, the few textbooks that existed were most commonly written in the ancient languages (Anderson 1872: 733).[45] Starting in the 1830s, the missionaries published and

[45] Eli Smith and H.G.D. Dwight found that the Armenian schools in the capital used a spelling book and also one or two first books in modern Armenian, their vernacular, but most of their books were written in classical Armenian, a tongue unknown to the common people (Smith and Dwight 1834: 17).

distributed the Bible, textbooks, newsletters, tracts, and correspondence in modern Armenian. It was not until 1853 that Armenian communal leaders adopted a plan encouraging the preparation and publication of textbooks (Young 2001: 205). The attempt to integrate textbooks into the classroom was met with obstacles given that the Armenian community was engulfed in a debate over the place of classical versus modern Armenian as the basis of written language. In 1853, when Krikor Odian, a member of the Educational Council, published a grammar book of modern Armenian, he was chastised by the conservatives. As a result, this book was officially banned by the patriarchate on January 25, 1855, its use forbidden (Sarafian 1930: 204). However, similar to other areas of influence, the existence of the Protestant alternative in the educational market that provided vernacular textbooks provided "an impetus for others to follow their example" (Merguerian 1998: 49). By the end of the nineteenth-century, the Armenian Patriarchate was compelled to reconsider its initial stance and started using the vernacular more widely in their schools.

Women's Education

Like other nationalist movements, women were seen by nationalist proponents of education as symbols of national progress, and their education was encouraged and praised because of their role as mothers and teachers. However, the education of girls in the Gregorian Church was "at a very low ebb" prior to the arrival of missionaries (Barnum 1893: 298). Before the advent of girls' schools, only the daughters of affluent parents learned to read and write (Clarke 1867). The one development that both sides unequivocally accepted is that the finding of schools for girls owe their development to the American example (Lynch 1901: 95; Barnum 1893). ABCFM missionaries opened a girls' day schools in Istanbul as early as 1832 and a school for Armenian girls in Smyrna in 1836. Both schools were

equipped with tools of modern education, such as benches, desks, and reading cards (Showalter 2012; Dwight 1850: 47).

Like the founding of common schools, the girls' schools evolved from a stance of persecution to one based on a sense of competition. Attempts to expand education for women was initially met with hostility by influential members of the Armenian community. However, as the popularity of these schools grew Gregorian Armenians realized that the failure to provide an education of equal footing would leave their girls under the influence of Protestant missionaries. In an Eastern Turkey village, upon the protestants building a girl's school and securing a teacher, local Armenians objected by saying, "Why are you pressing us like this? […] You attempt to drive us to open a girls' school. We simply cannot do it."[46] There are many other examples where that the establishment of girls' schools was based on the example of Protestants. In his memoirs, a Gregorian Armenian from Ichmeh (İçme, Elazığ) observes that it was only after the Protestant school was established and took girls in their school that the Apostolic Church began taking girls into their school (Pilibosian and Pilibosian 1992: 7). In Maraş too, the first Girls' Central School was founded by the Protestant community in 1856. This later spurred the Armenian Apostolic community to have its own school for girls (Keshishian 2012).

Discussion and Conclusion

The nineteenth-century was marked by profound change for Armenians living in the Ottoman Empire. The Tanzimat reforms, increasing penetration of the empire to Western commerce, and the internal power struggles in the community altered the composition of the Armenian millet during this period. Adding to these changes was the impact the

[46] Barnum, Herman N. 1891. "Barnum, H. N. (E. Turkey, 1858–1905)." American Board of Commissioners for Foreign Missions Archives ABC 66.

American Protestant missionaries, which intensified processes of secularization already in motion. In this complicated picture, a common narrative in Ottoman and Turkish studies has emphasized the prominent role of missionary schools spreading sedition and nurturing Armenian nationalism.

Using an original dataset of Armenian nationalists and archival data, this article has shown that this argument is relatively weak in the light of empirical evidence. Armenian nationalists were rarely products of the missionary schools operating within the Empire. Most Armenian nationalists sampled graduated from Armenian schools, with significant numbers attending well-known Armenian educational institutions in Istanbul and Russia. Meanwhile, the wealthier and usually urbanite Armenians pursued higher education in Western Europe. Taken together, it is evident that the national movement in the Ottoman Empire drew important inspiration from the intellectual currents outside imperial borders.

Still, a majority received their education at Armenians schools within the confines of the Ottoman Empire. It appears that it is in these schools that Armenians were imbued with the idea that they were a people with a just cause. However, to treat nationalism as a mass movement, education needs to reach a significant portion of the people and undergo a process of modernization. This is the point in which the impact of missionaries on the Armenian community was realized. This article has shown that while the missionaries did not have a direct effect, they inadvertently effected the rise of Armenian nationalism. This is primarily because of the intense competition the Armenian Church and Protestant missionaries engaged in during this period. This competition was most acutely realized in the Eastern Provinces and resulted in the Gregorian Armenians opening new schools as well as copying the methods and structure of missionary schools in order to remain competitive within the educational market.

The existence of similar patterns of competition between Protestant missionary schools and other indigenous educational institutions of the Orthodox Greek and Bulgarian community (Augustinos 1986) and Ottoman state (Fortna 2002; Deringil 1998: 112-34; Evered 2012) provides further evidence of the complicated and indirect ways in which Protestant missionaries altered the social landscape of the Middle Eastern region. One can also draw parallels between the Armenian case and other regions of the world where a competitive religious marketplace played a key role in bringing education to the masses. In Kerala, for example, missionary efforts to integrate education and focus on low-caste schooling fueled indigenous groups' efforts to do the same (Lankina and Getachew 2013; Bellenoit 2016; Deol 2000). In Egypt too, where British imperialism allowed for the freer evangelization of Muslims, Egyptian Muslim and Coptic Orthodox leaders were pressured into developing local alternatives to the social service projects offered by American missionaries (Baron 2014; Sedra 2002; Sharkey 2013; Jung 2020). The reaction of the Gregorian Church to Protestant missionaries was not an isolated case but part and parcel of a larger phenomenon of indigenous reaction to missionary expansion. In light of the evidence presented in this paper, I have expanded on the ways in which competition has played a critical role in the expansion of public goods in the Ottoman Empire. Conceding this point 150 years earlier, as one missionary put it, "in various ways the indirect-influence of the missionary work is even greater from the direct."[47]

[47] Barnum, Herman N. 1879. "Barnum, H. N. (E. Turkey, 1858–1905)." American Board of Commissioners for Foreign Missions Archives ABC 66.

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Appendix

Dataset of Armenian Nationalists

Table A.1: Full Sample of Armenian Nationalists

Last Name, First Name	Political Affiliation	Occupation	Born	High School-1	High School-2
Adian, Grigor	Armenakan				
Adjemian, Grigor	Armenakan				
Aghbalian, Nikol Poghosi	Dashnak	Public figure, Historian, Editor	Tiflis, Russian Empire	Nersesian School (Tiflis)	Gevorgian Seminary (Echmiadzin)
Aharonian, Avetis	Dashnak	Politician, writer, public figure	Igdir, Russian Empire	Gevorgian Seminary (Echmiadzin)	
Alishan, Father Ghevond	N/A	Catholic Priest, historian, poet	Istanbul, Ottoman Empire	Mkhitarist monastery (Venice)	
Amirian, Krikor	Dashnak	Military Commander	Bayburt, Erzurum Vilayet, Ottoman Empire	local Armenian School	
Andranik, Ozanian	Dashnak	Military Commander, fedai commander	Shabin Karahisar, Sivas Vilayet, Ottoman Empire	local Musheghian School	
Arpiarian, Arpiar	Hunchak	Writer	Istanbul, Ottoman Empire	Tarkmanchats Armenian School (Ortakoy)	

Artin Boşgezenyan	N/A	Deputy, Politician	Aleppo, Ottoman Empire		
Artsruni, Grigor	N/A	Journalist, Critic, Writer, Public activist	Moscow, Russian Empire	Educated at gynasium in Tiflis	
Asadour, Zabel	N/A	Poet, Writer, Publisher, Educator	Uskudar, Istanbul, Ottoman Empire	Üsküdar Djemaran	
Atabekian, Levon	Dashnak		Karabagh, Russian Empire	local school in Shushi	
Avedisian, Arakel	Dashnak	Fedayi	Kurter village, Bitlis, Bitlis Vilayet, Ottoman Empire	Arakelots monastery	
Avetisian, Meguerditch	Armenakan		Van, Van Vilayet, Ottoman Empire		
Baghamian, Marshal Ivan (Hovhannes)	N/A	Military Commander	Yelizavetpol, Elisabethpol Governorate, Russian Empire	Two-year school in Yelizavetpol	Tbilisi Military Academy
Baroudjian, M.	Armenakan				
Bedros Haladjyan	N/A				
Bekzadian, Alexander	Communist Party of Armenia	Statesman	Elizavetpol, Russian Empire	Educated Kiev	
Beozikian, Grigor	Armenakan				
Beyleryan, Mari	N/A	Feminist Activist, Writer, Public figure	Besiktas, Istanbul, Ottoman Empire	Naregyan/Esenyan	
Bezdjian, Harutiun	N/A	Money-changer, director of the Ottoman state mint	Sivrihisar, Ottoman Empire	Local Kumkapi School	

Boghosian, Nigol	Dashnak	Fedayi	Karabagh	Shushi	
Boroyan, Smbat	Dashnak	Military Commander	Mus Vilayet, Ottoman Empire	Surb Karapet Monastery	
Boyadjian, Hampartsum	Hunchak	Armenian fedayi and a leading political activist	Hadjin, Cilicia, Ottoman Empire	Armenian Church Education Center; Marhasahane	
Boyadjian, Harutiun-Mardiros (Zhirair)	Hunchak	Teachers, fedayee leader	Hadjin, Cilicia, Ottoman Empire	Vartanian school	
Bzhishkian, Haik	Hunchak	Military Commander	Tabriz, Qajr Iran	Nersesian School (Tiflis)	
Charents, Yeghishe	Communist Party of Armenia	Poet	Kars, Kars Oblast, Russian Empire	Armenian Elementary School (Kars)	
Chatavarian, Rouben	Armenakan				
Chavush, Kevork	Dashnak	Fedayi	Mus Vilayet, Ottoman Empire	Surb Karapet Monastery	
Cheraz, Minas	N/A	Writer, teacher	Istanbul, Ottoman Empire	Nersesian School (Haskoy)	
Chobanian, Arshag	Ramgavar Party	Writer, editor	Besiktas, Istanbul, Ottoman Empire	Makruhian school	
Daghavarian, Dr. Nazaret	N/A	Doctor, public activist, agronomist	Sivas, Ottoman Empire	Amenapırgiçyan Okulu	
Daghavaryan, Dr. Nazareth	Ramgavar Party; Freedom and Accord Party	doctor, agronomist and public activist, and one of the founders of the Armenian General Benevolent Union (AGBU)	Sivas, Ottoman Empire	Amenaprkchian and National Schools (Istanbul)	College of Practical Agriculture (Paris); Higher Agricultural College of France
Damadian, Mihran	Hunchak	Armenian freedom fighter, political activist, writer and teacher	Istanbul, Ottoman Empire	St. Hagop School	Vienna Mekhitarist School, Pangalti

Darbinyan, Artak	Armenakan	Journalist, Publicist	Van, Van Vilayet, Ottoman Empire	Holy Translators School (Van)	Gevorgian Seminary (Echmiadzin)
Derdzakian, Onnik	Dashnak	Politician	Istanbul, Ottoman Empire	Surenian School	Gevorgian Seminary (Echmiadzin)
Duman, Nikol	Dashnak	Teacher; Treasurer	Kishlak village, Khachen, Karabagh, Russian Empire	Diocesan School of Shushi	
Dzarugian, Toros	Hunchak	Political Activist		Educated in Yozgat (under Zhirayr)	
Gafavian, Arshak (Keri)	Dashnak	Fedayi	Erzurum, Erzurum Vilayet, Ottoman Empire	Local Armenian School	
Garo, Armen	Dashnak	Activist, Politician	Erzurum, Erzurum Vilayet, Ottoman Empire	Sanasarian College	
Ghazarian, Armenak	Dashnak	Teachers, Fedayi	Aharonk, Bitlis, Bitlis Vilayet, Ottoman Empire	Surb Karapet Monastery	National Central School of Moush (aka Nersessian School)
Gyulkhandanyan, Abraham	Dashnak	Politician, Historian	Vagharshapat, Russian Empire	Gevorgian Seminary (Echmiadzin)	Demidov Higher School
Hagop Babigyan	N/A	Parliament Deputy, Lawyer		Armenian School in Tekirdağ	
Hagop Boyacıyan	N/A	Parliament Deputy, educator	Tekirdağ, Ottoman Empire	Armenian School in Tekirdağ	Galatasaray Lycée
Hamparsoum Boyacıyan	Hunchak	Politician, Revolutionary	Hadjin, Cilicia, Ottoman Empire		
Handjian, Kevork	Armenakan				

Isahakyan, Avetik	Dashnak	Poet, Writer, Activist	Alexandropol , Russian Empire	Gevorgian Seminary (Echmiadzin)	
Isakov, Admiral Ivan	N/A	Military Commander	Hadjikend, Kars Oblast, Russian Empire	Realschule (Tiflis)	
Izmirlian, Matthew II	N/A	Catholicos of All Armenians	Istanbul, Ottoman Empire		
Kafavian, Keri	Dashnak	Fedayi	Erzurum, Erzurum Vilayet, Ottoman Empire		
Kanayan, Drastamat	Dashnak	Military Commander, Politician	Igdir, Russian Empire	Yerevan Gymnasium	
Kazazian, Hagop	N/A	Ottoman Minister of Finance	Istanbul, Ottoman Empire	Educated locally	
Kegham Der Garabetyan	Dashnak		Mus Vilayet, Ottoman Empire	St. Garabed Monestery (Mush)	Kevorkian Academy at Etchmiadzin
Kelegian, Diran	N/A	Journalist, editor, writer, and professor	Kayseri, Ottoman Turkey	Educated locally (Istanbul)	
Khajag, Karekin	Dashnak	journalist, writer, teacher	Alexandropol, Russian Empire	Gevorgian Seminary (Echmiadzin)	
Khan, Garabed Pashayan	Dashnak	Physician, doctor and public activist	Istanbul, Ottoman Empire	Medical College (Istanbul)	
Khanjian, Aghasi	Communist Party of Armenia	Statesman	Van, Ottoman Empire	Gevorgian Seminary (Echmiadzin)	
Khrimian, Donagan (Murad of Sebastatsi)	Dashnak	Fedayi	Gavdun, Sivas Vilayet, Ottoman Empire	Sunday School	

KOMITAS (Soghomon Soghomonian)	N/A	Armenian priest, musicologist, composer, arranger, singer, and choirmaster	Kütahya, Ottoman Empire	Gevorgian Seminary (Echmiadzin)	
Krikor Zohrab	N/A	Writer, Politician, Lawyer	Istanbul, Ottoman Empire	Shahnazarian School	Galatasaray Lycée
Malumian, Khachatur	Dashnak	journalist, political activist	Meghri, Zangezur, Russian Empire	Nersesian School (Tiflis)	Geneva University
Manoukian, Garegin	Armenakan	Painter	Van, Van Vilayet, Ottoman Empire	Central Gymnasium School (Van)	
Manukian, Aram (Sergei Hovhanessian)	Dashnak	Politician, Military Officer	Zeiva, nr Ghapan, Zangezur, Russian Empire	Diocesan School in Shushi	Yerevan Diocesan School
Matteos Sarkissian	Hunchak	Armenian fedayee, freedom fighter, writer and political activist	Meghri, Elisabethpol Governorate, Russian Empire	Nersesian School (Tiflis)	
Mikaelian, Christapor	Dashnak	Political activist, teacher	Agulis, Vaspurakan, Russian Empire	State Teacher-Training Institute (Tiflis)	
Minassian, Sarkis	Dashnak	Journalist, Writer, Educator	Cengiler, Yalova	Getronagan High School	
Mir Sakoyan, Melkon	Hunchak	Dentist, fighter			
Nazarbekian, Avetis	Hunchak	Armenian poet, journalist, political activist and revolutionary	Tabriz, Qajr Iran	Tbilissi Gymnasium	
Nazariantz, Hrand	N/A	Poet, translator	Üsküdar, İstanbul, Ottoman Empire		

Nersesian, Arshag	Dashnak; Hnchak	General	Tomna, near Bayburt, Ottoman Empire	National School (Trabzon)	
Nersesian, Arshak	Dashnak	General	Tomna, Bayburt	Azgayin Varzharan (National School) (Trabzon)	
Noradunkyan, Gabriel	Committee of Union and Progress	Ottoman statesman, bureaucrat	Istanbul, Ottoman Empire	St. Joseph's French High School	
Nubar, Boghos Pasha	Ottoman Armenian Statesman	Chairman of the Armenian National Assembly, philantropist	Istanbul, Ottoman Empire	Home Schooled	
Odian, Krikor	N/A	Ottoman Armenian jurist, politician, and writer	Istanbul, Ottoman Empire	Home Schooled, Istanbul	Paris
Okhigian, Armenag	Dashnak	Fighter	Bitlis, Ottoman Empire	Educated in Bitlis	
Papazian, Vahan	Dashnak	member of Ottoman Parliament, fedai	Tabriz, Qajr Iran	Primary education in Nahchivan	St. Petersburg University
Papazian, Vahan	Dashnak	Political Activist, community leader	Tabriz, Qajr Iran	Primary education in New Nakhichevan	Moscow and St. Petersburg University
Parian, Petros	Dashnak	Insurgent, Bank Robber	Akn, Harput, Ottoman Empire	Getronagan High School	
Parseghian, Kegham	N/A	Armenian writer, teacher, editor, and journalist.	Istanbul, Ottoman Empire	Mesrobian school	
Parseghian, Sarkis (Vana Sarkis)	Dashnak	Fighter	Kantzag region of the Caucasus	Nersesian College	
Pashalian, Levon	Hunchak	Short story writer, Journalist, Editor, Novelist, and Politician	Uskudar, Istanbul, Ottoman Turkey	Berberian School	

Pastermadjian, Karekin	Dashnak	Agriculturalist, member of Ottoman Parliament	Erzurum, Erzurum Vilayet, Ottoman Empire	Sanasarian College	Agricultural School of Nancy-Université
Peshiktashlian, Mkrtich	N/A	Poet	Istanbul, Ottoman Empire	Mkhitarist school	
Poghosian, Nikoghayos (ISHKHAN)	Dashnak	Journalist	Karabagh, Russian Empire	Educated Shushi	
Portukalian, Mekertich	Armenakan	Teacher	Kumkapi, Istanbul, Ottoman Empire	Mayr High School (Kumkapi)	Sahagyan High School (Samatyan)
Sabah-Gulian, Stepan	Hunchak	Armenian fedayee, freedom fighter, teacher	Nahchivan	Vartanian School	Nersesian School (Tiflis)
Sassouni, Garo	Dashnak	Intellectual, author, journalist, revolutionary, educator, and public figure	Sasun, Ottoman Empire	Mourad-Mkhitarian School (Mus)	
Serengülian, Vartkes	Dashnak	Politician, activist, member of Ottoman Parliament	Erzurum, Erzurum Vilayet, Ottoman Empire	Sanasarian College	
Serengülian, Vartkes	Dashnak	Political and Social activist	Erzurum, Erzurum Vilayet, Ottoman Empire	Ardzinian College (Erzurum)	Sanasarian College (Erzurum)
Serob, Aghbiur	Dashnak	Armenian military commander	Sokhord, Ahlat, Bitlis Vilayet, Ottoman Empire		
Shahrigian, Harutiun	Dashnak	Politician, Solider, Lawyer	Şebinkarahisar, Giresun, Ottoman Empire	Getronagan High School	Galatasaray High School
Shant, Levon	Dashnak	Playwright, Novelist, Poet	Istanbul, Ottoman Empire	Armenian School at Scutari	

Shishmanian, Dr. Hovsep	N/A	Writer, Doctor	Istanbul, Ottoman Empire	Educated San Lazzaro, Venice Mekhitarists School	
Stephan Ispartaliyan					
Tehlirian, Soghomon	Dashnak	Revolutionary	Nerkin Bagarij, Erzurum, Erzurum Vilayet, Ottoman Empire	Protestant Elementary School (Erzincan)	Getronagan High School
Tekeyan, Vahan	N/A	Armenian poet and public activist	Ortakoy, Istanbul, Ottoman Empire	Nersesian School	
Ter-Hakobian, Hakob (Shahan Natali)	Dashnak	Revolutionary, Writer	Usenik village, Kharberd province	Euphrates Collage	Berberian School
Terlemezian, Grigor	Armenakan	Journalist	Aygestan, Van, Van Vilayet, Ottoman Empire	Central Gymnasium School (Van)	
Terlemezian, Panos	Armenakan	Painter	Aygestan, Van, Van Vilayet, Ottoman Empire	Central Gymnasium School (Van)	
Tursargisian, Karapet	Hunchak	Political Activist	Hadjin, Cilicia, Ottoman Empire	Local School	Central School (Istanbul)
Tutundjian, Khosrov	Dashnak	Rebel, member of parliament, editor		To Istanbul in 1907 for further education, at Armenian schools	
Vardanian, Serob	Dashnak	Revolutionary, Fedayi	Ahlat, Bitlis	N/A	

Varoujan, Daniel	N/A	Poet	Brgnik village, Vilayet of Sebastia, Ottoman Empire		
Vramian, Arshag	Dashnak	Politician	Istanbul, Ottoman Empire	Gevorgian Seminary (Echmiadzin)	
Yarjanian, Atom	Dashnak	Writer, Poet, National figure	Eğin/Agh	Nersesian School (Tiflis)	Berberian School
Yekarian, Armenak	Armenakan	Fedayi	Van, Van Vilayet, Ottoman Empire	Varagavank Monastery	
Yesayan, Zabel	N/A	Novelist, Translator, Professor	Uskudar, Istanbul, Ottoman Empire	Holy Cross Elementary School	
Zardaryan, Ruben	N/A	Writer, educator, and political activist	Diyarbakır, Ottoman Empire	Red School, Harput	Euphrates Collage
Zartarian, Rupen	Dashnak	writer, educator, and political activist	Diyarbakır, Ottoman Empire	Central School (Harput)	
Zavarian, Simon	Dashnak	Teacher, Journalist, Political Activist	Aygelat, Armenia, Russian Empire	Nersesian School (Tiflis)	Moscow Institute of Agronomy
Zavriev, Hakob	Dashnak	Doctor	Tiflis, Russian Empire		St. Petersburg Army Medical Academy
Zoryan, Stepan	Dashnak	founder of ARF	Tsghna, Erivan Governorate	Parish School (Tsghna)	Beglarian Private School (Tblisi); State Real School; Novo-Alexandarian Agricultural School (Moscow)

Article 2: Unintended Consequences of Protestant Missionary Education in Ottoman Turkey: A Historical GIS Analysis

Abstract: A significant literature demonstrates that the presence of historic missionary societies — especially Protestant societies — during the colonial period is significantly and positively associated with increased educational attainment and economic outcomes. However, we know less about the mechanisms underlying the long-run consequences of institutions, as it is commonly very hard to disentangle direct effects from indirect effects. One clear way to do so, however, is to explore the long term impact of missionary influence in places in which the direct beneficiaries of missionary education are no longer present. The present paper considers one such region, the Anatolian region of the Ottoman Empire. Due to the ethnic violence and population movements at the start of the twentieth-century, the newfound Turkish nation-state was largely religiously homogenous. This provides us with a unique situation to empirically assess the long-run indirect effects of Christian missionary societies on local human capital. For this purpose, I present an original dataset that provides the locations of Protestant mission stations and schools, Ottoman state-run schools, and Armenian community schools contained within Ottoman Anatolia between 1820 and 1914. Contrary to the common association found in the literature, this study does not find missionary presence to be correlated with modern-day schooling. Rather, I find that regions with a heightened missionary presence and an active Christian educational market perform better on the Gender Parity Index for pre-tertiary schooling during both the Ottoman and Turkish periods.

Keywords: Historical GIS; Gender Parity; Education; Ottoman Empire; Christian Education; Human Capital Spillovers; Competition

Introduction

A significant literature demonstrates that the presence of historic missionary societies — especially Protestant societies — during the colonial period is significantly and positively associated with increased educational attainment and positive economic outcomes (Bolt and Bezemer 2009; McCleary and Barro 2019; Bai and Kung 2015). In most of these works, scholars claim that the transfer of human capital to local populations through the provision of schools, literacy campaigns, and vernacular translations of religious texts explains this relationship. Yet, it is also possible that missionaries affected long-term educational trends more indirectly through, for example, demonstration effects or spurring educational competition (Woodberry 2007). It is very hard to disentangle direct from indirect effects, especially for historical analyses that have limited data on missionary influence and educational outcomes. This task is not impossible, however. One potential way to do so is to explore the long term impact of missionary influence in places in which the direct beneficiaries of missionary education are no longer present.

To explore the indirect effect of missionaries on education, I study the educational legacy of American Protestant missionaries working amongst Ottoman Armenians in the late-nineteenth and early-twentieth centuries. Missionaries were banned from converting Muslims in the Ottoman Empire and concentrated most of their efforts on the conversion and education of the indigenous Ottoman Armenian population.[48] The missionary legacy in Turkey is difficult to pin down for the precise reason that large swaths of Armenian communities were destroyed and displaced as a result of the Armenian Genocide during World War I (WWI). The Turkish nation-state established in former empire's core territories

[48] The American Protestant missionaries also founded a Greek and Jewish Mission in the region in the early nineteenth-century. However, both these missions were limited in success and disbanded in 1844 and 1855 respectively.

after WWI was religiously homogenous due to the large scale ethnic violence and forced population movements of the early twentieth century. The mass expulsions of Armenians and Greeks led to an almost complete removal of these communities over a short time span, so that by 1927, 99 percent of the newly founded Turkish Republic registered as Muslim. Moreover, as a consequence of the early educational reforms of the early republican state, missionary schools were placed under government scrutiny and their operations severely curtailed.[49] This provides us with a unique situation well suited to empirically assess the long-run indirect effects of missionary societies on local human capital.

Losing a significant portion of missionary schools and highly educated minority groups undoubtedly led to a setback in education and literacy in the short-term in Turkey (Georgeon 1995: 173).[50] However, whether regions with prolonged exposure to missionary societies would maintain their educational lead long after the expulsions is not a trivial question. It is possible, for instance, that missionary education during the Ottoman-era had human capital spillover effects whereby the Muslim population living in close vicinity to missionary stations began to place greater value on education. Missionary effects on education could have also been sustained by spurring the Ottoman state's investment in schooling in places with a more active Christian educational landscape. Through some combination of emulation or competition, the legacy of missionaries could have been sustained through indirect channels even after the removal of the Armenian population. That being said, it is also equally possible that the removal of Armenians and missionary schools created a shock that could have had a persistent negative impact on education in

[49] According to a law based on March 23 1931, Turkish citizens were required to attend Turkish schools for primary education. As a result of the new regulation, over 1,200 missionary primary schools were closed down overnight and only higher levels of missionary education were allowed to continue their operations in the new Turkish Republic.

[50] The average enrollment in Muslim primary schools at the end of the nineteenth century was around 40 percent less than that found in Christian schools (Alkan 2000).

Turkey today. Scholars studying the consequences of forced expulsions of high-skilled minorities have generally found the removal of said people to be a detrimental to educational development of host countries (Waldinger 2011; Acemoglu, Hassan, and Robinson 2011). Others, in turn, stress the importance of intergenerational transmission of human capital for the sustained effects of schooling (see, Nimubona and Vencatachellum 2007). Consequently, whether a positive missionary legacy can be measured in the long-run in the absence of their target population is an empirical question that, so far, has not been rigorously addressed.

To evaluate long-term missionary legacies, I build and geocode an entirely new historical Geographic Information Systems (GIS) dataset of Protestant mission settlements and Gregorian Armenian schools. To this I add district-level Ottoman census information and socio-economic data for contemporary Turkey. Using this novel dataset, this article begins by evaluating the impact of Christian schooling for contemporary educational attainment at different levels. I show that districts with a higher concentration missionaries do not have higher levels of contemporary educational attainment. That being said, I do find evidence of a missionary legacy in Turkey working through indirect channels. In the second part of the article, I show that missionary presence and missionary-triggered religious competition had long-term effects on reducing the gender gap in education.

Through a battery of robustness checks I demonstrate that the relationship I establish very likely reflects the causal effects of educational competition rather than selection bias. First, my baseline results are robust to the inclusion of potential geographic, climatic, commercial and historical factors that might also have influenced educational development in Turkey. I also check whether an active Christian educational market explains female education and gender parity in primary level Muslim schooling for the late Ottoman period. I find that educational competition was influential in reducing the gender gap in education even before the large-scale expulsions in Anatolia. I show regions with a

heightened missionary presence and an active Christian education market had a larger number of female Muslim schools per capita and performed better on the gender parity index for Ottoman Muslim primary schools.

These findings allow us to interrogate both the established assumptions about missionary presence and historical development. They also help us specify the mechanisms through which the established missionary legacies are felt today. By removing the direct effects of missionary education, we are better able to isolate the indirect effects of missionary education for populations that were not directly targeted by their proselytizing efforts.

Related Literature

In *The Protestant Ethic and the Spirit of Capitalism*, Max Weber argued that a "Protestant ethic" was instrumental for the formation of capitalism and economic progress in Western Europe (Weber 1978). Following this seminal work, scholars have tried to grapple with the question of why Protestant regions of the world are more prosperous compared to their Catholic counterparts (e.g., Glaeser and Glendon 1998). Max Weber's interpretation rested on the idea that Protestant notions of salvation by grace propelled believers to work harder and save to show they were chosen by God. More recently, scholars have proposed an alternative explanation, stressing the role of education and a human capital channel in fostering economic development (Becker and Woessmann 2009). This theory rests on the assumption that Protestants placed a higher value on education. Scholars argue that higher schooling rates for Protestants in the past translated into higher economic prosperity today.[51]

[51] Becker, Pfaff, and Rubin (2016) provide a comprehensive survey of recent works on the short- and long-run effects of the Reformation, including Protestant-Catholic differences in human capital.

Similarly, both cross-country (Hall and Jones 1999) and within-country (Gennaioli et al. 2012) evidence supports the proposed link between human capital and prosperity. Further aiding this interpretation is the finding that early investment in human capital, once established, can have large and long-lasting effects on educational outcomes (Engerman, Mariscal, and Sokolof 2009; Huillery 2009). To cite one example, Gallego (2010) finds that primary enrolment in 1900 explains around 63 percent of cross-national variations in educational attainment figures today.

A related literature argues that the presence of historical missionary societies is associated with an increase in socio-economic standards. In the case of education, missionary investments in literacy and schooling propelled human capital formation within indigenous populations, prompting the intergenerational transmission of both knowledge and aspirations for education, which manifested in strong and persistent effects on increased educational attainment (McCleary and Barro 2019; Calvi, Mantovanelli, and Hoehn-Velasco 2019; Bolt and Bezemer 2009). Furthermore, it is argued that missionaries disproportionately affected male and female populations. A number of studies claim that the most significant contribution of missionary education was women's emancipation, which manifested itself in comparatively larger educational gains for women when compared to men (Nunn 2014; Fourie, Ross, and Viljoen 2014).[52]

Overall, these studies highlight the importance of early educational investments for contemporary development measures. Yet, the greater part of this literature lacks clarity regarding the mechanisms underlying the long-run consequences of historical educational institutions. Scholars propose what can be considered two distinct channels for the

[52] This finding receives support from more general studies of Protestantism. Becker and Woessmann (2008), for example, find that Protestantism was an important factor in the advancement of female education in nineteenth-century Prussia.

transmission human capital from missionaries to local populations. The first cluster of explanations can be labelled as direct effects and capture a host of mechanisms that flow from direct contact with missionaries. Those arguments falling under this umbrella highlight religious conversion and Westernization (Calvi, Mantovanelli, and Hoehn-Velasco 2019), diffusion of Western knowledge and norms (Bai and Kung 2015; Cagé and Rueda 2016; Waldinger 2017) and investments in schooling infrastructure by missionaries (Calvi, Mantovanelli, and Hoehn-Velasco 2019; Bolt and Bezemer 2009; Castelló-Climent, Chaudhary, and Mukhopadhyay 2017; Waldinger 2017; Wietzke 2015) as the key mechanisms for long-run education development. A second group of scholars stress indirect channels, specifically the role of competition or emulation in popularizing educational innovations introduced by Protestant missionaries to broader segments of the population (Lankina and Getachew 2013; Gallego and Woodberry 2010; Woodberry 2012; Trejo 2009; Woodberry and Shah 2004; Wantchekon, Klašnja, and Novta 2014). These two channels of influence on contemporary educational development are categorically distinct, yet few have tried to measure their effects separately. The main reason for this is that it is often hard to disentangle the direct effect of missionary education from the indirect. One way to clearly do so is exploring the consequences of missionary activities in places where missionaries and their target populations are no longer present.

This study considers Protestant missionary activities in Ottoman Turkey. Due to the removal of the Armenian population and closure of the bulk of missionary schools in the Turkish Republic, the legacies of Protestant missionaries should not work through direct channels. Rather, the case of Turkey provides us with a unique opportunity to separate direct effects from indirect effects and examine whether the impact of the latter can be observed in Turkey. If indirect effects exist, their influence should manifest through processes of emulation. Scholars of poverty and aspirations have found that social interactions with

skilled neighbors raise parental aspirations for their children, inducing them to invest more in their education (Dalton, Ghosal, and Mani 2016; Mookherjee, Ray, and Napel 2010). This argument goes hand-in-hand with other forms of human capital spillovers: "peer group effects," "social interactions" and "neighborhood effects" (Case and Katz 1991; Sanso-Navarro, Vera-Cabello, and Ximénez-De-Embún 2017). Using a longitudinal dataset from Benin, Wantchekon, Klašnja, and Novta (2014) show that descendants of uneducated people in villages with missionary schools do better than those in villages with no schools. Scholars have found these human capital externalities to manifest themselves both within and across ethnic groups (Cutler and Glaeser 1997; Glaeser et al. 1992).

Finally, this research speaks to debates within Ottoman historiography. Recent contributions to the study of Ottoman education recognize that the perception of threat from missionaries and the relative educational deprivation of Muslims in relation to Christians significantly shaped the inauguration and later investments in an empire-wide compulsory public education system (Evered 2012; Deringil 1998; Fortna 2002). Thus, a desire for an education of better quality by local Muslims could have been complemented by an indirect influence on the supply side. In analyzing the indirect effects of missionary activities, I hope to uncover whether this understanding has empirical backing and whether these legacies can be observed today.

Historical Context

Protestant Missionary Education

The late-eighteenth and early-nineteenth century Protestant religious revivals (also known as the "Second Great Awakening") galvanized American Protestants into finding new denominations, benevolent societies, and missionary organizations. The American Board of Commissioners for Foreign Missions (ABCFM) was one of the most influential missionary societies born out of this period. Propelled by evangelical zeal of the time, the ABCFM set itself the goal of "promulgating Christianity among the heathen" (ABCFM 1834: 67) of the world. After expanding its networks to Bombay, Ceylon, and the Hawaii, the ABCFM missionaries turned their attention to the Ottoman Empire and the Holy Lands it ruled over.

The ABCFM work in the Ottoman Empire began in 1820 when two missionaries, Levy Parsons and Pliny Fisk, landed in Izmir (Smyrna). The first generation of ABCFM missionaries were interested in converting the Jews and Muslims of the Ottoman Empire. However, when these efforts did not produce the desired results, the missionaries in 1856 decided to turn the bulk of their attention to the Gregorian Armenians.[53] This strategic shift turned the missionary gaze away from the coastal regions, inhabited by Muslims, Jews and Greeks, onto the hinterlands of Anatolia where the majority of Armenians were living. In these regions the missionaries established an extensive network of schools catering to all levels as a way of attracting local populations to their religious message. They opened kindergartens, primary and secondary schools in many towns and villages. They also founded several institutions of higher learning: Central Turkey College in Antep (1876), Euphrates College in Harput (1878), Central Turkey Girls' College in Maraş (1880), and Anatolia

[53] Gregorian Church is also referred to as the Armenian Orthodox Church or the Armenian Apostolic Church.

College in Merzifon (1886). By the turn of the century, the American Board of Foreign Missions had rapidly expanded its operations in Asiatic Turkey to include 12 stations and 270 outstations headed by 145 missionaries, 811 native workers and 1,266 schools at all levels catering to approximately 60,000 students (Dwight, Tupper, and Bliss 1904: 31).

Missionary schools were amongst the first purveyors of modern education[54] in the Ottoman Empire and offered an education of good quality. They provided modern curricula and innovations such as science laboratories, programs for girls, co-education, kindergartens, and demonstrated farm schools. There were also pivotal in introducing technological advancements — such as textbooks, blackboards, reading cards, desks, chairs — into Ottoman classrooms. The study of the Bible occupied a central place in missionary education. The Protestant principle of *sola scriptura* stresses the individual's right and need to read the Bible; this meant that spreading literacy and reading the Bible in the vernacular became central components of missionary education. Attesting to this focus, it is reported that 85 percent of Ottoman Protestants could read and write in the 1870s (Masters 2009: 387). The religious focus of missionary education was complemented by regular classes on history, literature, mathematics, science, economics, logic and philosophy (Merguerian 2006).

One of the most significant educational innovations of American missionaries in the region was the provision of education for women. ABCFM missionaries opened a girls' day school in Istanbul in 1832, and later transplanted similar institutions to remote Anatolian villages. Attempts to expand education to women was initially met with hostility from established elites of Eastern Christian churches. However, this began to change as the

[54] Modern school systems are characterized by: 1) a more or less differentiated school system with subdivision into classes, levels, types, and graduate qualifications, 2) teaching according to a prearranged curriculum, and 3) a systemic differentiation between teaching and learning (Adick 1992). Prior to the late eighteenth-century, the Ottoman Empire did not contain schools that fit this description.

popularity of these schools grew. Ottoman Christians realized that the failure to provide an education of equal footing would leave their girls under the influence of Protestant missionaries. Reflecting on the state of education in the city of Van at the end of the nineteenth century, British traveler H.F.B. Lnych wrote:

> There can be little doubt that the Armenian schools are greatly benefited by competition with the less fashionable American institutions. They at least receive a certain stimulus and some new ideas. This is notably the case in respect of their schools for girls, which owe their development to the American example (Lynch 1901: 95).

This sequence of events was representative of the interactions Protestant missionaries had with the established elites of the Eastern Churches. Greek, Armenian, and Bulgarian hierarchies all fought Protestant missionary inroads into their membership. Armenian schools were, in turn, frequently perceived by the missionaries as "established in imitation or rivalry" (ABCFM 1869: 6). Yet, at the same time, education for the missionaries was "a race" (Barnum 1890) or "a case of the survival of the fittest" (Barnum 1891). Given that both the Gregorian schools and the Protestant schools were targeting a common base, the success of one side invited completion and reform.

Gregorian Armenian Education

The Ottoman State was ruled based on the principle of Islamic Law (*shariah*). This meant that the Ottoman administration regarded Christian and Jewish populations as peoples of the book (*dhimmi*), and accorded them semi-autonomous status in their community affairs. This allowed these communities to maintain their language and traditions

within their own schools and to resort to community courts to resolve their legal disputes. Yet, despite the institutional space available to realize indigenous Christian schooling, it was not until the eighteenth century formalized schooling system developed among the Armenian community in the Ottoman Empire (Somel 2007).

Many of the early Armenian schools were funded by powerful *amiras* (Armenian notables) and provided a predominantly religious education geared towards the children of the religious or economic elite (Barnum 1893; Somel 2005: 254-55). This began to change as progressive Armenians started challenging the established sarraf-amira hierarchy[55] and vying for power over the Armenian Patriarchate. A group of Armenians who had been educated in Europe — referred to as the Young Armenians — labored to reform the Armenian educational system (Artinian 1988). In 1853, under the auspices of the Armenian Patriarchate, members of the Young Armenians established the National Educational Council. The Education Council was tasked with training teachers, preparing textbooks, and holding annual examinations (Lynch 1901: 457). The council was incorporated into the Political Assembly after the promulgation of the Ottoman Armenian National Constitution in 1862, and was crucial for the systemization of Armenian education in the Ottoman Empire.

Thus, starting in the 1860s, the Armenian Church led a concerted effort to expand its educational efforts beyond the confines of large metropolises. According to a survey conducted by the Armenian Patriarchate in 1834, there were 120 Armenian elementary schools in various parts of Anatolia (Ergin 1977: 753). By the 1870s, the number of Armenian schools in the provinces had more than quadrupled (Young 2001: 97). One crucial

[55] The sarraf-amiras were composed of bankers, merchants and money-lenders and given their dominant position in society were interested in preserving the status quo. The technocrat-amiras on the other hand, held official Ottoman posts and were interested in curtailing the power of the sarrafs, and thus were supporters of reform (Barsoumian 1982).

factor that propelled the Armenian community to invest in mass education and modernize its schooling system was the challenge the Armenian church received from the American Protestant missionaries. The doctrinal differences between the two camps (Chopourian 1972) and the subtraction of tax-paying members of the Gregorian community (Davison 1973: 118) generated significant tensions between the two camps. This forced the Armenian Patriarch to publish a bull of excommunication and anathema in 1846 barring all Armenians who were known to have dealings with Protestants from the Armenian Church. As a result, the Evangelical community was forced to seek official millet status and create its own community institutions. The official recognition of Protestant millet in 1850 undermined the unifying power of the Church (Kassouny 1931: 25; Richter 1910: 112) and challenged the overlap between race and religion in the Empire. Following this event, we can see the relations between the Armenian Church and Protestant missionaries started to evolve from persecution to competition. Crosby Howard Wheeler, a Protestant missionary stationed in Harput (modern-day Elazığ), summarizes the nature of this newfound competition as follows:

> But our efforts and those of the Protestant churches and communities, have likewise awakened the public spirit of the remaining Armenians, and the fears of their ecclesiastics, lest we get away all their adherents, so they too open schools, and in other ways teach the people…Most of the schools sustained by the Armenians may fairly be put to the missionary credit, since, to say nothing of the fact that their opening schools at all is owning to missionary influence, the great majority of them now kept open merely in opposition to Protestant schools, and would be closed if these were to cease (Wheeler 1868: 120).

The modernizing reforms that were carried out by the Armenian community in the first half of the nineteenth-century were mostly elite driven projects carried out by Armenians living in and around Istanbul. When Protestant missionaries entered the Ottoman educational market, upper-class male Armenian education was already established and provided by amira-funded Armenian schools and French Catholic missionary schools in Istanbul. Thus, in order to carve out a meaningful share of the educational market, Protestant missionaries concentrated their efforts on women, the poor and other socially marginalized members of the community for conversion. The entrance of Protestant missionaries into the educational market pressured the Armenian Patriarchate to expand its educational efforts into Eastern Anatolia and formalize a school system catering to all social classes and sexes. Ottoman provincial yearbooks show that Armenian and Protestant missionary schools were often built in the same year or in quick succession of one another (e.g., Taşkın 2013). Accompanying this quantitative change was the qualitative transformation of the Gregorian Armenian classroom. In order to remain competitive in the educational market and stop students from defecting to Protestant missionary schools, Armenian schools adopted many innovations introduced by missionaries. They started using standardized curriculums, printing textbooks, opening co-educational and girls' schools and started prioritizing the vernacular over classical Armenian. Thus, the spread of Protestant competition motivated Armenian elites to promote an education of higher quality for all social groups within the Armenian community. The question remains, however, whether this educational expansion had long-term effects on education in Ottoman Turkey given the subsequent removal of both Armenians and missionaries, an issue I now explore.

Data and Sources

To explore the indirect effects of missionary education, I use spatial analysis techniques to explore whether the presence of missionary and Gregorian schools and competition between both are related to subsequent levels of education. Spatial analysis techniques are an increasingly popular tool in examining the impact of historical missionary societies on modern societies (e.g., Calvi and Mantovanelli 2018; Castelló-Climent, Chaudhary, and Mukhopadhyay 2017; Waldinger 2017). This method is particularly instrumental to understanding the legacies of historical institutions because it allows researchers to combine spatial representation of substantive information from diverse time periods. This study contributes to this field and emerging methodology by examining the effects of historical educational competition in Ottoman Turkey on contemporary education measured as educational attainment of the population for elementary and high schools. The statistical component of my analysis is based on an original GIS dataset, covering all relevant educational institutions, the religious distribution of the population according to the 1893 Ottoman Census, and contemporary regional educational attainment figures.

1893 Ottoman Census and Administrative Divisions

The first step in the data collection process consists of mapping nineteenth-century demographic data onto historically accurate administrative boundaries. For the construction of historical population measures, I use the data reported by the Population Census of the Ottoman Empire conducted between 1881-1893 (Karpat 1985), excluding Ottoman regions that fall outside the boundaries of the modern Turkish republic. Excluded from my analysis is also the Sanjak of Kars, which was under Russian jurisdiction from 1878 to 1918.[56] I then

[56] As a result of the occupation of Kars by the Czarist Russia, most Ottoman schools in the

develop a geographical component of the 1893 Ottoman Census as a GIS dataset to gather, manage, and process the different geographic and statistics files to be created. Tanzimat-era Ottoman census data production used three spatial levels: (1) *vilayet* (province), (2) *sanjak* (sub-division), and (3) *kaza* (district). As the first two levels are too expansive spatially to produce refined research results, I arrive at the Ottoman *kaza* as my preferred unit of observation.

The 1893 Census reports the distribution of the population according to sex and religion at the *kaza* level.[57] Several scholars have identified these figures as the most reliable population figures of the nineteenth century (Elibol 2007; Karpat 1985; Behar 2000). There are several additional reasons for selecting this census over other censuses. To begin, the 1893 Census is the first official census to count both males and females.[58] While previous censuses did exist, these records were produced primarily for military purposes and thus counted only males. Efforts to approximate the total population (including women) could lead to biased results. Secondly, many early census counts were disrupted by wars underway in the Ottoman state during the nineteenth century. For example, the first organized attempt to count the Ottoman population was spearheaded by the Porte in 1829, only to be abandoned shortly thereafter with the outbreak of the Ottoman-Russian War.[59] This census

region were shut down (Ortaylı 1978; Topçu and Kop 2017). Thus, it is not possible to meaningful compare the legacies of educational competition in this region to those that remained under Ottoman rule.

[57] There are a few *vilayets* (provinces) – namely, Bitlis, Erzurum, Mamuratülaziz and Halep – where the 1893 census counts are not provided for the all constituent kazas. In order to complete the missing information for these provinces, I relied on vilayet *salnames* (provincial yearbooks) that were compiled around the time of the 1881-1893 census. See Table A.2 in the Appendix for a full list of salnames used to compensate for missing data.

[58] It is also the first census where the individual, rather than the household or production unit, was taken as a reference point. It was executed in an analogous fashion throughout the empire managed through a centralized authority unconnected to financial or military departments.

[59] This is commonly described as the first modern census. Population approximations for pre-modern period can be established through *tahrir* (inscription) books that were kept primarily for taxation purposes. The earliest example of this type of document dates back to the fifteenth century (Behar 2000).

covered only ten *eyalets* (provinces), leaving a great number of villages in those *eyalets* uncounted. Lastly, the 1893 Census is uniquely valuable in that it predates the ethno-religious violence that drastically altered the distribution of minorities in the region. The Hamidian Massacres (1894-1896) and the Armenian Genocide (1915) led to the decimation of large swaths of the Armenian and other Christian groups in the Ottoman Empire. Those who could escape this onslaught converted to Islam, migrated to larger cities, or sought a new life in Europe, North America, and Latin America. Taken together, these reasons point to the 1893 Census is the earliest and most reliable census to document the population in Ottoman Turkey.

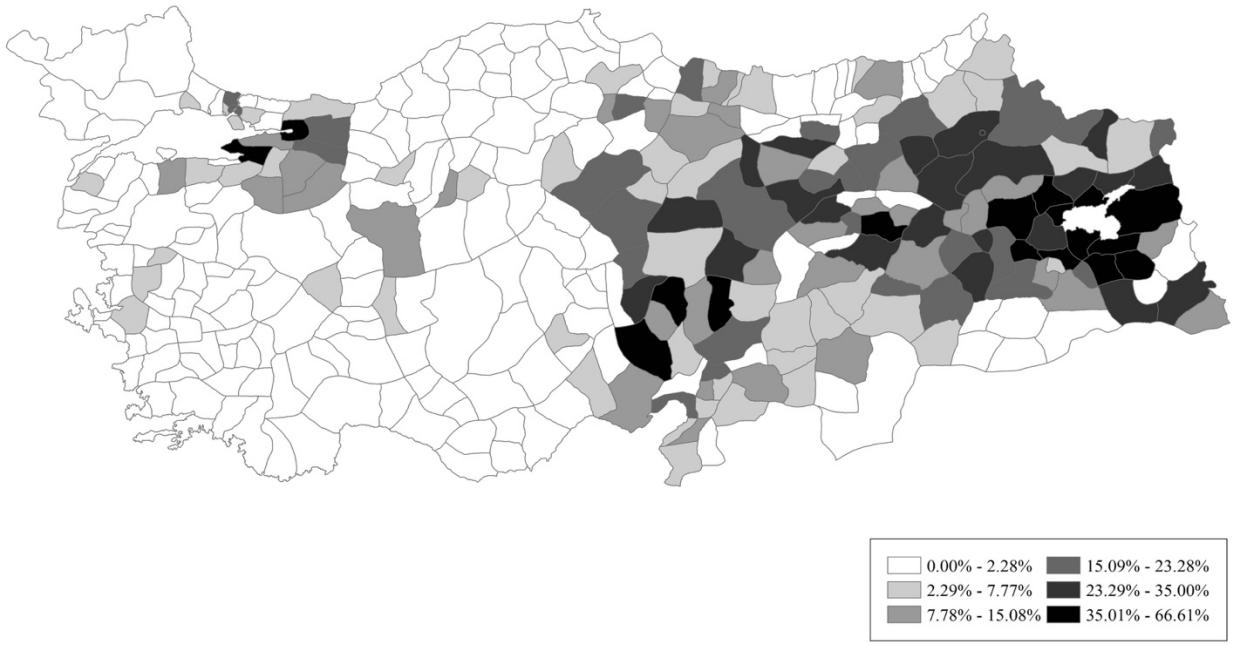
In order to map the Ottoman *kazas* captured in the 1893 Census onto modern Turkish districts, I used the 1899 map created by R. Huber, which contains the administrative and political divisions of the Ottoman Empire. The map was georeferenced to the surface of the earth and fit a modified "TUREF / LAEA Europe" projection.[60] Based on this map, I manually traced the administrative boundaries of all *kazas* contained within the 1893 census using tools in ArcGIS.[61] The next stage consisted of creating three sets of files. The first set contains *kaza* boundary files comprising 332 polygons, which allow for the spatial processing of census data. The file also serves to reconstitute an upward hierarchy of census geography: *kaza*, *sanjak*, and *vilayets*. Along with the *kaza* geographic files, two sets of statistical files that are linked to *kaza* and *sanjak* polygons were also created.

[60] The TUREF / LAEA projection uses the Turkish Reference Frame (TUREF) geographic as its base coordinate reference system and the Europe Equal Area 2001 (Lambert Azimuthal Equal Area) as its projection. The TUREF / LAEA is the recommended form of projection for the Turkey where true area representations are needed.

[61] Between 1893 and 1899, some kazas were disaggregated or integrated into other regions. For these locations, I relied on provincial yearbooks to trace how the geographical boundaries reflected in the 1899 map appeared in 1893. Figure A.3 in the Appendix displays the kaza polygons that I created superimposed onto the historical Huber map.

There is yet to emerge a standardized way of linking the names of historical sites and current gazetteers (Berman, Åhlfeldt, and Wick 2016). In order to match each modern Turkish district (~957) to an Ottoman district (~332), I used the historical gazetteer of the Ottoman Empire compiled by Sezen (2017). A significant majority of the administrative borders of the *kazas* were altered when the core region of the Ottoman Empire was succeeded by the Turkish Republic. The Ottoman gazetteer provides an index of 120,000 places from the reign of Suleiman the Magnificent, documenting the changing administrative boundaries of these historic localities. This record allows me to search for the names of modern Turkish districts *(ilçe)* and identify the Ottoman kaza to which they once belonged to. Due to the fact that Ottoman *kazas* were generally larger than modern Turkish districts, in most cases, I had multiple modern districts that matched with a single Ottoman *kaza*. Furthermore, for certain modern districts, it was not possible to identify the historic *kaza* or *sanjak* that these areas belonged to – in large part, because the given locality was created after the founding of the Turkish Republic and therefore did not exist in the Ottoman times. For such districts, I relied on the geographic coordinates of the district capital as an approximation. Figure 1 presents the share of the Armenian population in Ottoman Turkey according to the 1893 Ottoman Census.

Figure 1: Percentage of Ottoman Armenian Population (1893)



Historical Schooling Data

Protestant Missionary Stations and Schools

For the present study, the exact locations of historical mission stations and outstations are not provided. Past studies have used mission atlases such as the *Atlas of Protestant Missions*, *Atlas Hierarchicus* or the *World Atlas of Christian Missions* to obtain information on the locations of missions. Yet, these sources are known to omit many locations where missionaries and native workers operated, and can potentially yield biased results. Hence, I rely instead on archival missionary sources, such as annual reports, letters and diaries housed at the Archives of the ABCFM at Houghton Library.

Based on the names provided in these missionary publications, I found the exact geographic coordinates of 420 historical mission main stations and out-stations contained

within the borders of modern-day Turkey.[62] If the mission station became a present-day locality, I found its coordinates using online geocoding tools. A small minority of locations were cases wherein the name had remained relatively stable from the late Ottoman period to the consolidation of the modern Turkish state (e.g. Adabazar vs. Adapazari). More often, the location of former mission stations had changed in name or ceased to exist. One study finds that around 35 percent of all villages in Turkey experienced a name change since the establishment of the Turkish Republic in 1923 (Tunçel 2000). Part of this was the result of "toponymical engineering" (Öktem 2008), which aimed to erase the memory of an ethnically, religiously and linguistically diverse past – especially, in Eastern Anatolia. For these locations, I consulted a variety of sources (Hewsen and Salvatico 2001; Kévorkian and Paboudjian 2012; Nişanyan 2010) and relied on data triangulation (Denzin 1989) to aid the process of geocoding missionary stations.[63] In total, I was able to track down the coordinates for 97 percent of the missionary stations referenced in ABCFM annual reports.

[62] In contrast, the *Atlas of Protestant Missions* lists 21 main stations and 295 outstations in the Mission to Turkey without providing station names or locations. The map for Asiatic Turkey in appendix of the *Atlas of Protestant Missions* depicts the exact locations of only 22 stations in Asia Minor.

[63] Despite the multitude of sources used in the process of geocoding the locations of missionary stations, there still remained other important challenges to determining the exact locations. The lack of standardization of languages was a serious issue. In an Empire where illiteracy was widespread, locale names were often part of local everyday oral knowledge. Transliteration was one method capture the pronunciation. Yet even so, various spellings of locales existed. For example, the historical village of Arotsig (now under the Keban reservoir) could be written as Arosig, Arozig, or Arozik (reflecting differences between Western and Eastern Armenian). Adding to this was the fact that many regions in Eastern Anatolia contained religiously diverse populations. A given location could have a different name in Turkish, Kurdish (either Zaza or Kurmanji) or Armenian (ex. Arotsig was called Akmezraa in Turkish). Confounding this issue further was the reality that the missionaries were operating in a land foreign to them. While they did make significant efforts to learn the local languages of Anatolia, they were not experts, and in many instances recorded the same village name in numerous ways even within their own publications (example Kapikaya is recorded as Kapu Kaya, Kapoo-Kaya, Kapori Kaya in ABCFM Annual Reports). Finally, some village names were very common. One could find several villages called "Venk/Vank" (monastery in Armenian), "Gaban/Keban" (passage in Armenian) or "Yenice" (newish/newly in Turkish) in a radius of 100km. If I did encounter several villages with the same name I followed particular steps. I first went through the correspondences and diaries of missionaries to see if they gave any hints as to where that

The dataset contains 17 mission main-stations and 413 out-stations in total. For each station, I recorded the corresponding main station, regional mission, *kaza*, and *vilayet* that it belonged to. I also noted any variations on the name of the location, as well as the longitude and latitude of each location. To discern the differences between missionary educational activities and their broader evangelical work, I also collect data on the schools Protestant missionaries founded in Ottoman Turkey. This data comes from Gülbadi Alan (2015) work on American Protestant schools in the Ottoman Empire. Using the information described above in conjunction with census data from 1893, I calculate two different measures of missionary presence for each kaza: Missionary Schools per 1000 people and Missionary Stations per 1000 people.[64] Figure 2 shows the geocoded locations of all missionary stations contained within the borders of modern Turkey.

Figure 2: ABCFM Missionary Stations in Ottoman Turkey

particular village was. I paid special attention to the description of the immediate surroundings of the village such as other villages or any landscape marks (rivers, mountains, lakes, etc.) that might set the location apart from others. I also made sure that other sources provided evidence that a Christian or Protestant community lived in the said village. If no such hints existed, I would select the closest village with that name to the main station.

[64] Given that Protestant Missionaries primarily tried to convert members of East Christian churches, my population figure is the number of number of non-Muslims reported in the Ottoman Census of 1893.

Gregorian Armenian Schools

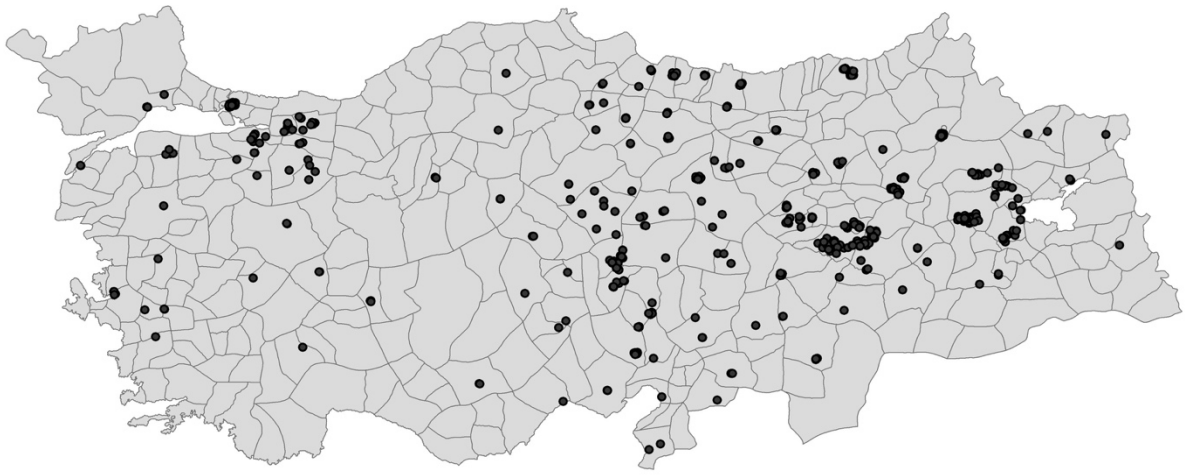
The data for the Armenian schools comes from the Cultural Heritage Map of Turkey created by the Hrant Dink Foundation (https://turkiyekulturvarliklari.hrantdink.org/en). The map carefully records Armenian, Greek, Syriac, and Jewish socio-cultural and spiritual life in Ottoman Turkey. Information on public buildings such as churches, schools, monasteries, cemeteries and hospital was created relying on primary and secondary sources. The online map contains the exact locations of 1252 Gregorian Armenian schools built during the Ottoman period. Using this source, I compute the exact number of schools in each kaza using tools in the ArcGIS software. Similar to the previous sections, I then calculate a "schools per capita" measure using the Armenian population figures in the 1893 Census. Figure 3 details the geocoded locations of all Gregorian Armenian schools in the Ottoman Empire.

Figure 3: Gregorian Armenian Schools in Ottoman Turkey

Competition Measure

Informed by the historical outline provided in Section 3, I also consider the competition between Protestant missionary and Armenian schools as an explanatory variable. In order to capture the intensity of local Christian competition, I rely on the geo-coded locations of nineteenth-century Gregorian Armenian schools and Protestant missionary stations. Taking advantage of the geographic scale of this data it is possible to determine the places where these two types of schools existed within a 5 km radius of one-another. I then calculate how many competitive dyads there are in each kaza. Finally, using the number dyads, I come up with a "competition per capita" figure for each kaza. Figure 4 shows the locations of all Competitive dyads in Ottoman Turkey.

Figure 4: Competitive Dyads in Ottoman Turkey



Outcome Measures

Throughout this article, I examine the relationship between the location of American Protestant and Gregorian Armenian institutions and contemporary pre-tertiary educational attainment. The central long-term outcome measures used in this article is educational

attainment for elementary and high school education in modern-day Turkey. For each level this is the share of the population above age 15 that has received elementary or high school education. The education data is obtained from the Turkish Statistical Institute (TÜİK) for the year 2010. Building on the district matching techniques detailed in the previous sections, I merge the contemporary educational figures with my GIS dataset. Additionally, using these figures, I calculate a gender parity index (GPI) for each educational level measured as the ratio between the absolute number of female and male population with a given degree in 2010.[65]

Control Variables

In order to account for potential exogenous drivers of public schooling being established in more urbanized or physically accessible areas, I construct several measures of demographic, geographic and climatic attributes. I rely on the share of Christians living in a given district as my proxy for ethno-religious diversity. The basis for selecting this measure over other more nuanced calculations of ethnic diversity is that one of my primary independent variables, missionary presence, altered the composition of religious diversity in the region.[66] Furthermore, it is imperative to control for historical Christian presence given that some studies have found that it is positively related to contemporary economic and educational outcomes in Turkey (e.g., Arbatli and Gokmen 2018). To capture geographic characteristics, I measure the average elevation of the district, the average annual temperature

[65] In recent years, scholars have gravitated towards using GPI – as opposed to other absolute measures of female education – to capture women's human capital (King and Hill 1997).
[66] The liberal reforms during the Tanzimat period did ease the restrictions surrounding Muslim conversion. However, the attempts at, and success of, such efforts were limited. By 1878, Cyrus Hamlin (1878: 91) estimated that a total of 50 Muslims had been converted in the past twenty years.

of the district, the average annual precipitation of the district,[67] and the minimum distance from the centroid of the district to major rivers and lakes. All geographical variables are constructed using tools in ArcGIS. I include these variables to account for any direct impact of geography on development. I also rely on several historical variables to capture differences across districts in initial states that may affect current educational levels. The list of controls include distance to late nineteenth-century railroad, nineteenth-century carriage road density, distance to major nineteenth-century ports, distance to the capital (Istanbul), distance to Ottoman trade routes, and a dummy variable indicating whether a kaza was the administrative capital of a sanjak in 1893. See Table 1 for the descriptive statistics of all variables used in my analysis.

Table 1: Summary Statistics

VARIABLES	N	Mean	SD	Min	Max
Share of the Population with Elementary Degree (2010)	332	0.55	0.076	0.252	0.69
Share of the Population with High School Degree (2010)	332	0.166	0.054	0.0416	0.36
GPI for High Schools (2010)	332	0.595	0.174	0.129	0.963
GPI for Elementary Schools (2010)	332	0.931	0.145	0.399	1.229
Total Population (1893)	332	42,606	84,415	0	873,565
(log) Population Density (1893)	332	2.702	1.104	-8.178	9.12
Christian Share of Population (1893)	332	0.171	0.190	0	0.929
Armenian Share of Population (1893)	332	0.0819	0.127	0	0.666
Number of Missionary Stations	332	1.244	2.461	0	30
Number of Missionary Schools	332	0.916	3.689	0	59
Number of Female Missionary Schools	332	0.105	0.685	0	11
Missionary Schools per Capita	332	0.188	0.926	0	12.14
Missionary Stations per Capita	332	0.725	5.274	0	90.91
Number of Armenian Schools	332	3.907	8.653	0	75
Armenian Schools per Capita	334	2.126	6.648	0	58.82
Number of Competitive Dyads	332	0.437	0.792	0	7
Competition per Capita	332	0.511	3.257	0	55.56
Average Temperature	331	115.7	33.23	30.29	190.9
Average Precipitation	331	646.1	211.8	316.5	2,085

[67] Precipitations and temperature are often correlated with each other so I include them separately in each model. The use of one variable over another did not alter my final results.

Average Elevation	332	1,029	604	12.68	2,569
(log) Distance to Lake	332	3.264	4.43	-0.283	10.95
(log) Distance to River	332	7.054	4.882	0	12.27
(log) Distance to Capital	332	12.85	1.572	0	14.13
19th Century Carriageway Density	332	0.0131	0.0128	0	0.064
(log) Distance to Carriageway	332	4.218	4.985	0	11.73
(log) Distance to 19th Century Railroad	332	10.08	4.676	0	13.83
(log) Distance to Port	332	10.83	2.835	0	13.17
(log) Distance to Ottoman Trade Route	332	4.243	4.814	0	11.55
Central Kaza Dummy	332	0.172	0.378	0	1
Number of Male Students at Ibtidâîs (1914)	274	699.8	1,014	0	8,847
Number of Female Students at Ibtidâîs (1914)	274	183.5	475.3	0	4,005
GPI for Ibtidâîs (1914)	267	0.213	0.203	0	0.953
Number of Female Ibtidâî Schools (1914)	274	1.536	2.593	0	21
Female Ibtidâî Schools per Capita (1914)	253	0.387	0.466	0	3.333
Concentration of Female Rüşdiyye Schools (1902-1919)	332	0.21	0.725	0	4.5

Results

Educational Attainment

In the following, I use the data set described in Section 4 to examine whether long-run educational outcomes differ among localities that had varying concentrations of Protestant missionary schools and Gregorian Armenian schools. Because the channels which direct effects can operate through are blocked, the following models are testing for the presence of indirect missionary effects only. As described in the previous section, I examine the relationship between the location of historical educational institutions and two different educational outcome variables. My baseline specification in given by:

$$y_i = \alpha(School_x)_{k_i} + \delta ln(PD_{1893}) + \beta X_i + \varepsilon_i$$

Where y_i is an outcome of interest, the share of the population with a given degree, in district i. The dependent variable measures percent of population with an elementary or high school degree. My main variable of interest, $(School_x)_{ki}$, captures the distribution of a given school x (Protestant Missionary or Gregorian Armenian) in the Ottoman kaza k to

which district i was assigned. I use the concentration of schools in a given kaza as my main measure of school presence. I also consider missionary stations per capita as an alternative measure capturing missionary presence. In all specifications, α measures the long-term link between nineteenth-century schooling and current educational outcomes. Population density, $ln(PD_{1893})$, is included as a proxy for initial economic conditions and urbanization levels. X_i denotes a host of control variables, namely demographic, geographic conditions, climate, location, and political characteristics. Standard errors here and in all following specifications are clustered at the level of the Ottoman sanjak in 1893. There existed 53 Anatolian sanjaks at the time. All control variables are described in detail in Section 4 and further information on the calculation of each variable is provided in the Appendix.

Missionary Institutions

Tables 2 begins by reporting the results for the base-line OLS specification for Protestant missionary schools and missionary stations, respectively. Contrary to past analyses of missionary education and educational outcomes, a comparison across columns shows that a majority of the models failed to identify relationship between missionary school concentration and elementary degree attainment. This finding therefore suggests that the impact of missionary education on these outcomes is direct. Model 5 does report a 0.04 percent increase in the share of the population with an elementary degree for a one unit increase in missionary stations per 1000 persons. Yet, this association disappears when including geographic, climatic, commercial and political controls in Models 6-8. The share of Christians in 1893, average elevation, average precipitation, distance to railroad and distance to capital are all statistically significant and *negatively* related to elementary degree holders in Model 8. Nineteenth-century carriage road density and distance to river on the other hand

are positively related to the share of the population with an elementary degree. Surprisingly, being an administrative capital in the nineteenth-century decreases the share of contemporary elementary enrolment by around 4 percent.

Table 2: Missionary Institutions and Elementary Enrollment

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
(log) Population Density (1893)	0.0135**	0.00802	0.00497	0.00664	0.0139**	0.00815	0.00503	0.00672
	(0.00667)	(0.00701)	(0.00651)	(0.00442)	(0.00667)	(0.00699)	(0.00650)	(0.00440)
Christian Share	-0.145****	-0.160****	-0.149****	-0.144****	-0.144****	-0.159****	-0.148****	-0.143****
	(0.0353)	(0.0257)	(0.0242)	(0.0232)	(0.0356)	(0.0259)	(0.0243)	(0.0233)
Missionary Schools Per Capita	-0.00412	-0.00237	-0.00108	-0.00115				
	(0.00336)	(0.00378)	(0.00333)	(0.00341)				
Missionary Stations Per Capita					0.000435*	0.000193	0.000297	0.000303
					(0.000259)	(0.000242)	(0.000280)	(0.000297)
Average Elevation		-4.77e-05****	-3.85e-05***	-3.34e-05**		-4.80e-05****	-3.86e-05***	-3.35e-05**
		(1.06e-05)	(1.20e-05)	(1.27e-05)		(1.04e-05)	(1.19e-05)	(1.27e-05)
Average Precipitation		-8.09e-05***	-5.18e-05*	-5.12e-05*		-8.09e-05***	-5.13e-05*	-5.08e-05*
		(2.43e-05)	(2.86e-05)	(2.77e-05)		(2.42e-05)	(2.86e-05)	(2.77e-05)
(log) Distance to Lake		-0.000625	-0.000669	-0.000667		-0.000558	-0.000624	-0.000620
		(0.00111)	(0.00107)	(0.00111)		(0.00111)	(0.00107)	(0.00110)
(log) Distance to River		0.00229**	0.00206**	0.00180**		0.00231**	0.00205**	0.00180**
		(0.000944)	(0.000849)	(0.000820)		(0.000963)	(0.000862)	(0.000835)
(log) Distance to Port			0.00108	0.000316			0.00108	0.000312
			(0.00123)	(0.00126)			(0.00124)	(0.00126)
(log) Distance to Ottoman Trade Route			0.000598	-4.76e-05			0.000590	-5.56e-05
			(0.000876)	(0.000882)			(0.000881)	(0.000887)
(log) Distance to 19th Century Railroad			-0.00314***	-0.00329***			-0.00318***	-0.00333***
			(0.000969)	(0.00110)			(0.000966)	(0.00111)
19th Century Carriageway Density			0.481	0.650*			0.485	0.653*
			(0.397)	(0.345)			(0.396)	(0.343)

(log) Distance to Capital				-0.00265				-0.00262
				(0.0103)				(0.0103)
Central Kaza Dummy				-0.0398****				-0.0398****
				(0.00879)				(0.00876)
Average Temperature								
Constant	0.538****	0.641****	0.632****	0.675****	0.536****	0.640****	0.632****	0.674****
	(0.0212)	(0.0314)	(0.0308)	(0.125)	(0.0210)	(0.0316)	(0.0309)	(0.125)
Observations	330	329	329	329	330	329	329	329
R-squared	0.146	0.319	0.353	0.387	0.144	0.319	0.353	0.388

Robust standard errors in parentheses
**** p<0.001, *** p<0.01, ** p<0.05, * p<0.1

Tables 3 replicates the eight models in Table 2 but uses high school degree attainment as the dependent variable and suggest that missionaries either had no indirect effect on this outcome or had negative indirect effects. As Model 1–4 show, no statistically significant differences were found between places with missionary schools and places that lacked such educational establishments. Whereas, looking at Model 5–8, we can see that the concentration of missionary stations is negatively related to high school degree holders in all models. In Model 8, a one unit increase in the missionary stations per capita decreases the share of the population with a high school degree by 0.04 percent. The only other variables that are positive and statistically significant in this final model are central kaza dummy and road density. Being a nineteenth-century administrative capital increases the share of the population with a high school degree by 3.97 percent, whilst a one-standard deviation increase in road density corresponds to around 1 percent increase for the share of the population with a high school degree. A one unit increase in the Christian share of the population on the other hand yields 3.54 percent increase in contemporary high school degree attainment. Log of population density in 1893 is significant in Models 1 through 7, but loses its significance in the final model.

Table 3: Missionary Institutions and High School Enrollment

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
(log) Population Density (1893)	0.0138****	0.0102****	0.00587**	0.00176	0.0136****	0.0100****	0.00578**	0.00168
	(0.00338)	(0.00266)	(0.00245)	(0.00328)	(0.00333)	(0.00265)	(0.00245)	(0.00332)
Christian Share	0.0399*	0.0393**	0.0466**	0.0367*	0.0392*	0.0383*	0.0455**	0.0355*
	(0.0232)	(0.0194)	(0.0185)	(0.0202)	(0.0234)	(0.0196)	(0.0187)	(0.0204)
Missionary Schools Per Capita	0.00107	0.00168	0.00253	0.00294				
	(0.00328)	(0.00240)	(0.00248)	(0.00260)				
Missionary Stations Per Capita					-0.000343*	-0.000414**	-0.000334	-0.000397*
					(0.000195)	(0.000193)	(0.000244)	(0.000210)
Average Elevation		-1.97e-05***	-1.06e-05	-1.15e-05		-1.94e-05***	-1.05e-05	-1.14e-05
		(7.16e-06)	(7.53e-06)	(8.28e-06)		(7.10e-06)	(7.60e-06)	(8.41e-06)
Average Precipitation		2.43e-06	1.89e-05	2.25e-05		2.22e-06	1.83e-05	2.18e-05
		(2.16e-05)	(2.23e-05)	(2.12e-05)		(2.15e-05)	(2.23e-05)	(2.11e-05)
(log) Distance to Lake		-0.000721	-0.000640	-0.000417		-0.000784	-0.000721	-0.000512
		(0.000669)	(0.000707)	(0.000717)		(0.000665)	(0.000706)	(0.000714)
(log) Distance to River		0.000655	0.000419	0.000548		0.000652	0.000408	0.000537
		(0.000632)	(0.000615)	(0.000607)		(0.000644)	(0.000631)	(0.000626)
(log) Distance to Port			-0.00222**	-0.00126			-0.00222**	-0.00126
			(0.00109)	(0.00122)			(0.00109)	(0.00122)
(log) Distance to Ottoman Trade Route			-0.000391	0.000200			-0.000388	0.000204
			(0.000756)	(0.000735)			(0.000761)	(0.000740)
(log) Distance to 19th Century Railroad			-0.00177**	-0.00105			-0.00170**	-0.000971
			(0.000761)	(0.000645)			(0.000761)	(0.000645)

19th Century Carriageway Density			0.864***	0.782***			0.856***	0.773***
			(0.271)	(0.265)			(0.270)	(0.265)
(log) Distance to Capital				-0.00450*				-0.00445*
				(0.00243)				(0.00242)
Central Kaza Dummy				0.0397****				0.0397****
				(0.00659)				(0.00664)
Average Temperature								
Constant	0.122****	0.148****	0.173****	0.214****	0.123****	0.150****	0.174****	0.215****
	(0.00938)	(0.0183)	(0.0254)	(0.0412)	(0.00930)	(0.0186)	(0.0257)	(0.0412)
Observations	330	329	329	329	330	329	329	329
R-squared	0.115	0.174	0.239	0.308	0.115	0.175	0.238	0.307

Robust standard errors in parentheses

**** p<0.001, *** p<0.01, ** p<0.05, * p<0.1

Gregorian Armenian Schools

The expansion and modernization Gregorian Armenian education was in part due to the stimulus it received from Protestant missionaries, and could have also led to human capital spillovers for the local Muslims. In order to test this indirect channel, Table 4 presents the results for the base-line OLS specification for Gregorian Armenian schools. Using Armenian schools per capita as my explanatory variable, I find no evidence that the concentration of Ottoman-era Armenian Schools has an influence on contemporary elementary degree attainment in Models 1–4 or high school degree attainment in Models 5–8. The direction and significance for the control variables in Tables 4 are nearly identical to those reported in the models with missionary institutions.

Table 4: Gregorian Armenian Schools and Educational Attainment

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
(log) Population Density (1893)	0.0138**	0.00812	0.00494	0.00657	0.0137***	0.0101****	0.00576**	0.00180
	(0.00662)	(0.00698)	(0.00649)	(0.00443)	(0.00333)	(0.00265)	(0.00250)	(0.00330)
Christian Share	-0.145****	-0.159****	-0.148****	-0.142****	0.0388	0.0388*	0.0470**	0.0357*
	(0.0345)	(0.0249)	(0.0230)	(0.0216)	(0.0235)	(0.0196)	(0.0190)	(0.0207)
Armenian Schools Per Capita	0.000170	-6.80e-06	-0.000114	-0.000327	0.000233	8.97e-05	-0.000134	0.000109
	(0.000695)	(0.000715)	(0.000730)	(0.000725)	(0.000421)	(0.000391)	(0.000396)	(0.000398)
Average Elevation		-4.81e-05****	-3.87e-05***	-3.36e-05**		-1.93e-05***	-1.05e-05	-1.13e-05
		(1.05e-05)	(1.19e-05)	(1.27e-05)		(7.07e-06)	(7.59e-06)	(8.37e-06)
Average Precipitation		-8.11e-05***	-5.16e-05*	-5.08e-05*		2.51e-06	1.88e-05	2.21e-05
		(2.42e-05)	(2.86e-05)	(2.76e-05)		(2.16e-05)	(2.23e-05)	(2.12e-05)
(log) Distance to Lake		-0.000569	-0.000646	-0.000645		-0.000765	-0.000697	-0.000486
		(0.00112)	(0.00108)	(0.00110)		(0.000663)	(0.000701)	(0.000709)
(log) Distance to River		0.00232**	0.00206**	0.00179**		0.000639	0.000382	0.000528
		(0.000963)	(0.000865)	(0.000834)		(0.000638)	(0.000632)	(0.000622)
(log) Distance to Port			0.00105	0.000208			-0.00226**	-0.00123
			(0.00122)	(0.00125)			(0.00107)	(0.00122)
(log) Distance to Ottoman Trade Route			0.000617	-1.23e-05			-0.000386	0.000176
			(0.000865)	(0.000875)			(0.000760)	(0.000740)

(log) Distance to 19th Century Railroad			-0.00316***	-0.00334***			-0.00173**	-0.000998
			(0.000963)	(0.00109)			(0.000772)	(0.000667)
19th Century Carriageway Density			0.490	0.671*			0.863***	0.766***
			(0.390)	(0.338)			(0.264)	(0.259)
(log) Distance to Capital				-0.00261				-0.00435*
				(0.0103)				(0.00240)
Central Kaza Dummy				-0.0404****				0.0398***
				(0.00854)				(0.00654)
Average Temperature								
Constant	0.536****	0.641****	0.633****	0.676****	0.122****	0.148****	0.174****	0.212****
	(0.0208)	(0.0317)	(0.0309)	(0.126)	(0.00938)	(0.0185)	(0.0258)	(0.0405)
Observations	330	329	329	329	330	329	329	329
R-squared	0.143	0.318	0.353	0.388	0.115	0.174	0.237	0.306

Robust standard errors in parentheses

**** p<0.001, *** p<0.01, ** p<0.05, * p<0.

Christian Competition

In this section, I use the dataset and competition indices described in Section 4 to test whether long-run educational attainment figures differ among localities that had educational competition. My key independent variable is the number Protestant and Armenian schools within a 5-kilometer radius of one another in a given district adjusted to the Armenian population of that district. The empirical model I estimate is as follows:

$$y_i = \alpha(CompetitionPerCapita)_{k_i} + \delta ln(PD_{1893})_i + \beta X_i + \epsilon_i$$

A comparison across Model 1–4 in Table 5 shows that competition per capita is positively related to the share of the population with an elementary degree in all models. In Model 4, each additional competitive dyad per capita is associated with a 0.82 percent increase in the share of the population with an elementary degree. Similar to earlier models investigating elementary education, central kaza dummy, Christian share, and average elevation are negatively correlated with elementary degree attainment. Likewise, road density and average precipitation are positively related to elementary degree holders. This being said, I am unable to replicate this association for high school educational attainment. Looking at Models 5–8, we see that Christian Competition per capita is not related to high school degree attainment in any of the models. The results therefore suggest that missionaries had indirect effects on education through the competition mechanisms, although this only seems to hold for primary education.

Table 5: Christian Competition and Educational Attainment

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
(log) Population Density (1893)	0.0140**	0.00840	0.00527	0.00683	0.0137***	0.0100****	0.00575**	0.00175
	(0.00650)	(0.00684)	(0.00642)	(0.00442)	(0.00336)	(0.00269)	(0.00249)	(0.00332)
Christian Share	-0.156****	-0.167****	-0.157****	-0.152****	0.0400	0.0411**	0.0482**	0.0377*
	(0.0344)	(0.0247)	(0.0225)	(0.0215)	(0.0244)	(0.0202)	(0.0195)	(0.0213)
Christian Competition per Capita	0.00304***	0.00207****	0.00198***	0.00182**	-3.93e-05	-0.000511	-0.000497	-0.000314
	(0.000557)	(0.000542)	(0.000622)	(0.000631)	(0.000494)	(0.000422)	(0.000507)	(0.000442)
Average Elevation		-4.69e-05****	-3.73e-05***	-3.23e-05**		-1.97e-05***	-1.07e-05	-1.16e-05
		(1.04e-05)	(1.18e-05)	(1.26e-05)		(7.08e-06)	(7.57e-06)	(8.40e-06)
Average Precipitation		-7.97e-05***	-5.09e-05*	-5.03e-05*		2.23e-06	1.85e-05	2.21e-05
		(2.40e-05)	(2.82e-05)	(2.74e-05)		(2.16e-05)	(2.23e-05)	(2.11e-05)
(log) Distance to Lake		-0.000537	-0.000582	-0.000577		-0.000768	-0.000712	-0.000498
		(0.00111)	(0.00106)	(0.00109)		(0.000662)	(0.000701)	(0.000712)
(log) Distance to River		0.00226**	0.00201**	0.00176**		0.000649	0.000408	0.000529
		(0.000961)	(0.000861)	(0.000837)		(0.000649)	(0.000634)	(0.000630)
(log) Distance to Port			0.000998	0.000259			-0.00220**	-0.00126

			(0.00124)	(0.00127)			(0.00110)	(0.00123)
(log) Distance to Ottoman Trade Route			0.000487	-0.000139			-0.000373	0.000203
			(0.000859)	(0.000869)			(0.000766)	(0.000746)
(log) Distance to 19th Century Railroad			-0.00318***	-0.00331***			-0.00172***	-0.00101
			(0.000954)	(0.00110)			(0.000755)	(0.000644)
19th Century Carriageway Density			0.462	0.633*			0.862***	0.775***
			(0.387)	(0.339)			(0.267)	(0.263)
(log) Distance to Capital				-0.00281				-0.00430*
				(0.0101)				(0.00242)
Central Kaza Dummy				-0.0391***				0.0395***
				(0.00874)				(0.00659)
Average Temperature								
Constant	0.536****	0.638****	0.632****	0.676****	0.122****	0.149****	0.173***	0.213****
	(0.0204)	(0.0310)	(0.0305)	(0.123)	(0.00930)	(0.0185)	(0.0257)	(0.0409)
Observations	330	329	329	329	330	329	329	329
R-squared	0.159	0.326	0.360	0.393	0.114	0.174	0.238	0.306

Robust standard errors in parentheses
**** p<0.001, *** p<0.01, ** p<0.05, * p<0.1

Discussion

The results above suggest there is no positive and consistent association between missionary schools per capita and educational attainment in Turkey. This stands in stark contrast to the majority of works on missionaries which have found a consistent and positive association between missionary schools and educational development. These findings offer evidence that previous findings are driven by direct effects of missionary investments in schooling such as infrastructure and the intergenerational transmission of human amongst target populations. In the absence of both, I find that districts with a higher concentration of missionary stations are worse off in terms of high school degree attainment. One potential explanation for this observation is the detrimental impact of population movements that Eastern Ottoman Provinces experienced after WWI. Missionaries concentrated their efforts overwhelmingly in Armenian villages that were subsequently resettled by refugees from the Balkans and Caucasus following various episodes of ethnic violence in Eastern Anatolia. There is evidence to suggest that these regions today are more conservative and, consequently, lag behind in terms of education and literacy (Sakalli 2019).

Whilst missionary presence on its own does not contribute to contemporary elementary schooling, I find that a more active Christian educational market is a significant predictor of share of the population with an elementary degree. Ottoman historians have rightfully pointed out that one of the reasons the Porte invested in public education was the fear that Muslims were falling behind their Christian co-nationals in terms of education. A dynamic Christian educational market could have motivated the Porte to invest more in education and for Muslims to value education in the short-term. Both propositions will be further investigated in the robustness checks section.

Gender Parity Index (GPI)

Missionary Institutions

The literature on the legacy of missionary institutions also claims that missionaries had different effects on male and female educational outcomes. A number of analysts claim that missionaries empowered women primarily through indirect channels (Lankina and Getachew 2013; Nunn 2014). In order to test this claim, I include female-to-male ratios of attendance at elementary and high school levels of schooling as my dependent variable. Table 6 provides the results for my models with missionary institutions and gender parity for elementary levels of schooling. Looking at Models 1–4, missionary schools per capita is related to the GPI only in Model 3. In contrast, the results in Models 5–8 show that missionary stations per capita is positively related to the GPI for elementary schooling in all models. This means that each additional missionary station per capita in Model 8 is associated with an increase in the GPI by around 0.14 percent. Christian share, distance to major port, average precipitation, average elevation are all negatively related to the GPI at the elementary level. Contrary to the earlier models investigating the impact of overall educational attainment, the central kaza dummy fails to explain the gender parity in elementary education. Whereas, nineteenth-century road density is a significant predictor of both overall enrolment and improvement of female education — as one standard deviation increase in road density corresponds to around 3.8 percent increase in the GPI.

Table 6: Missionary Institutions and Gender Parity Index for Elementary Schools

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
(log) Population Density (1893)	0.0520****	0.0444****	0.0347***	0.0296***	0.0522****	0.0444****	0.0348***	0.0300***
	(0.0123)	(0.0126)	(0.0109)	(0.0106)	(0.0122)	(0.0125)	(0.0109)	(0.0106)
Christian Share	-0.178**	-0.200****	-0.177****	-0.187****	-0.175**	-0.198****	-0.175****	-0.185****
	(0.0689)	(0.0525)	(0.0485)	(0.0482)	(0.0689)	(0.0528)	(0.0487)	(0.0486)
Missionary Schools per Capita	0.00164	0.00336	0.00536	0.00612				
	(0.00509)	(0.00352)	(0.00383)	(0.00399)				
Missionary Stations per Capita					0.00164***	0.00121**	0.00134**	0.00122*
					(0.000442)	(0.000459)	(0.000596)	(0.000631)
Average Elevation		-7.86e-05****	-6.13e-05***	-5.09e-05*		-7.81e-05****	-6.05e-05**	-5.04e-05*
		(2.17e-05)	(2.29e-05)	(2.69e-05)		(2.14e-05)	(2.28e-05)	(2.68e-05)
Average Precipitation		-0.000155**	-0.000113	-0.000103		-0.000154**	-0.000112	-0.000103
		(6.98e-05)	(7.42e-05)	(7.43e-05)		(6.97e-05)	(7.40e-05)	(7.41e-05)
(log) Distance to Lake		-0.00203	-0.00214	-0.00164		-0.00204	-0.00216	-0.00171
		(0.00189)	(0.00202)	(0.00204)		(0.00188)	(0.00202)	(0.00204)
(log) Distance to River		0.00249	0.00211	0.00178		0.00239	0.00199	0.00167
		(0.00180)	(0.00159)	(0.00159)		(0.00181)	(0.00161)	(0.00161)
(log) Distance to Port			-0.00372	-0.00343			-0.00374	-0.00348
			(0.00261)	(0.00250)			(0.00262)	(0.00252)
(log) Distance to Ottoman Trade Route			0.000287	3.33e-05			0.000204	-4.85e-05
			(0.00172)	(0.00178)			(0.00173)	(0.00179)
(log) Distance to 19th Century Railroad			-0.00342	-0.00217			-0.00342	-0.00222

			(0.00236)	(0.00273)			(0.00235)	(0.00273)
19th Century Carriageway Density			2.235***	2.465****			2.219***	2.438****
			(0.663)	(0.676)			(0.666)	(0.680)
(log) Distance to Capital				-0.0165				-0.0157
				(0.0193)				(0.0189)
Central Kaza Dummy				-0.00835				-0.00881
				(0.0181)				(0.0180)
Average Temperature								
Constant	0.820****	1.014****	1.038****	1.235****	0.818****	1.012****	1.038****	1.226****
	(0.0388)	(0.0650)	(0.0746)	(0.239)	(0.0386)	(0.0651)	(0.0747)	(0.235)
Observations	330	329	329	329	330	329	329	329
R-squared	0.177	0.312	0.358	0.367	0.180	0.313	0.359	0.367

Robust standard errors in parentheses

**** p<0.001, *** p<0.01, ** p<0.05, * p<0.1

Counterintuitively, as one moves into higher levels of schooling I find contradictory results in respect to the impact of missionary schooling and missionary stations. In Models 3 and 4 in Table 7, each additional missionary school per capita corresponds to a 0.88 percent increase in the GPI for high schools. Whereas, looking at Model 5–8, we can see that missionary stations per capita is negatively related to the GPI in all models. Model 8 reports a 0.19 percent decrease in the GPI for a one unit increase in missionary stations per capita. What explains this discrepancy? Part of the reason could be the different strategies governing Ottoman investment in post-elementary education for women. As shown in Table 6, gender parity in elementary schooling is related to missionary presence (i.e. station presence) rather than the concentration of educational institutions they established in a given region. This finding aligns with Ottoman historians' interpretation that investment in compulsory primary education was driven by the existential threat of missionaries. Higher levels of female education on the other hand was a costly and undervalued endeavor and was most likely governed by separate dynamics. Furthermore, as mentioned in the previous section, missionary stations were set up in places where the Armenians formed a larger share of the population.[68] The conservative population that replaced the Armenians might not have valued non-compulsory female education. I will investigate this issue further in the robustness section to see whether the existence of primary and secondary female schools in the late Ottoman period was influenced by schools or stations differently.

[68] The correlation between number of Missionary Stations and Armenian share of the Population according to the 1893 Census is 0.4. See Figure A.2 in the Appendix for a visualization of this relationship.

Table 7: Missionary Institutions and Gender Parity for High Schools

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
(log) Population Density (1893)	0.0655****	0.0417****	0.0306****	0.0282****	0.0652****	0.0412****	0.0302****	0.0279****
	(0.0139)	(0.00720)	(0.00562)	(0.00583)	(0.0137)	(0.00709)	(0.00557)	(0.00583)
Christian Share	0.0208	-0.000955	0.0114	0.00591	0.0181	-0.00521	0.00712	0.00149
	(0.0879)	(0.0510)	(0.0506)	(0.0549)	(0.0882)	(0.0509)	(0.0506)	(0.0552)
Missionary Schools per Capita	0.000320	0.00485	0.00704*	0.00731*				
	(0.00927)	(0.00410)	(0.00413)	(0.00413)				
Missionary Stations per Capita					-0.00130***	-0.00177****	-0.00152**	-0.00157***
					(0.000440)	(0.000501)	(0.000573)	(0.000579)
Average Elevation		-0.000154****	-0.000123****	-0.000122****		-0.000153****	-0.000123****	-0.000122****
		(1.82e-05)	(2.06e-05)	(2.33e-05)		(1.81e-05)	(2.07e-05)	(2.34e-05)
Average Precipitation		-7.20e-05	-3.75e-05	-3.47e-05		-7.31e-05	-3.98e-05	-3.71e-05
		(5.74e-05)	(6.02e-05)	(6.03e-05)		(5.72e-05)	(6.02e-05)	(6.03e-05)
(log) Distance to Lake		-0.00273	-0.00277	-0.00261		-0.00295	-0.00304	-0.00288
		(0.00208)	(0.00202)	(0.00195)		(0.00207)	(0.00201)	(0.00195)
(log) Distance to River		0.00252	0.00143	0.00144		0.00254	0.00143	0.00144
		(0.00173)	(0.00177)	(0.00178)		(0.00174)	(0.00179)	(0.00180)
(log) Distance to Port			-0.00872**	-0.00829**			-0.00871**	-0.00827**
			(0.00386)	(0.00393)			(0.00389)	(0.00396)
(log) Distance to Ottoman Trade Route			-0.00100	-0.000797			-0.000968	-0.000762
			(0.00154)	(0.00161)			(0.00151)	(0.00160)

(log) Distance to 19th Century Railroad			-0.00575**	-0.00529**			-0.00551**	-0.00504*
			(0.00245)	(0.00261)			(0.00243)	(0.00261)
19th Century Carriageway Density			1.543**	1.540*			1.521**	1.518*
			(0.713)	(0.775)			(0.707)	(0.766)
(log) Distance to Capital				-0.00403				-0.00411
				(0.00803)				(0.00791)
Central Kaza Dummy				0.0150				0.0150
				(0.0204)				(0.0205)
Average Temperature								
Constant	0.415****	0.678****	0.797****	0.840****	0.418****	0.683****	0.801****	0.845****
	(0.0400)	(0.0505)	(0.0721)	(0.121)	(0.0395)	(0.0510)	(0.0727)	(0.120)
Observations	330	329	329	329	330	329	329	329
R-squared	0.176	0.444	0.484	0.485	0.178	0.446	0.485	0.486

Robust standard errors in parentheses

**** p<0.001, *** p<0.01, ** p<0.05, * p<0.1

Christian Competition

In this section, I use the competition score described in Section 4 to test whether the GPI in educational attainment differs among localities that had educational competition. Similar to the previous section, I consider the competition between Protestant missionary and Armenian schools. Basic statistics in Table 8 show that competition per capita is significantly and positively related to the GPI for elementary schooling in Models 1 through 4. In Model 4, each additional competitive dyad in a given kaza is associated with a 0.23 percent increase in the GPI for elementary school. Moreover, the size of the coefficient is slightly larger than the those for missionary stations per capita reported in Table 7. Road density remains positive and significant in Models 3 and 4, with a one standard deviation in road density corresponding to a 3.73 percent increase in the GPI in Model 4.

Model 5 through 8 in Table 8 reports the relationship between the Christian competition per capita and high school GPI. A comparison across columns shows that competition per capita is positive and statistically significant in all models. This means that a competitive educational environment also had positive educational legacies for reducing the gender inequality in high schools. In Model 8, each additional competitive relationship corresponds to a 0.35 percent increase in the GPI for high schools. Log population density and road density are both positive and significantly related to high school gender parity whilst distance to railroad, distance to port and average elevation are all negatively related. All in all, these results therefore offer clear and consistent evidence that missionary educational competition had indirect effects on female education, suggesting that Ottoman authorities were most likely to expand female education in regions when missionary and Armenian schools competed for female students.

Table 8: Christian Competition and Gender Parity Index

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
(log) Population Density (1893)	0.0521****	0.0445****	0.0349***	0.0299***	0.0658****	0.0419****	0.0308****	0.0286****
	(0.0120)	(0.0124)	(0.0108)	(0.0107)	(0.0137)	(0.00706)	(0.00555)	(0.00583)
Christian Share	-0.192***	-0.208****	-0.185****	-0.196****	-0.000600	-0.0111	-0.00124	-0.00694
	(0.0697)	(0.0533)	(0.0489)	(0.0483)	(0.0872)	(0.0500)	(0.0484)	(0.0531)
Competition per Capita	0.00382**	0.00206*	0.00192**	0.00193**	0.00574***	0.00264*	0.00287**	0.00295**
	(0.00151)	(0.00106)	(0.000940)	(0.000922)	(0.00211)	(0.00143)	(0.00131)	(0.00129)
Average Elevation		-7.69e-05****	-5.96e-05**	-4.93e-05*		-0.000151****	-0.000120****	-0.000120****
		(2.14e-05)	(2.26e-05)	(2.67e-05)		(1.79e-05)	(2.03e-05)	(2.32e-05)
Average Precipitation		-0.000153**	-0.000113	-0.000103		-7.00e-05	-3.70e-05	-3.43e-05
		(6.95e-05)	(7.37e-05)	(7.38e-05)		(5.66e-05)	(5.93e-05)	(5.94e-05)
(log) Distance to Lake		-0.00208	-0.00220	-0.00172		-0.00281	-0.00283	-0.00269
		(0.00188)	(0.00202)	(0.00204)		(0.00206)	(0.00201)	(0.00194)
(log) Distance to River		0.00239	0.00200	0.00166		0.00239	0.00127	0.00128
		(0.00179)	(0.00159)	(0.00159)		(0.00172)	(0.00175)	(0.00177)
(log) Distance to Port			-0.00381	-0.00351			-0.00885**	-0.00841**
			(0.00259)	(0.00249)			(0.00384)	(0.00391)
(log) Distance to Ottoman Trade Route			0.000150	-9.76e-05			-0.00120	-0.000988
			(0.00173)	(0.00179)			(0.00158)	(0.00166)
(log) Distance to 19th Century Railroad			-0.00336	-0.00211			-0.00566**	-0.00521**
			(0.00235)	(0.00272)			(0.00238)	(0.00255)

19th Century			2.197***	2.419****			1.488**	1.478*
Carriageway Density								
			(0.663)	(0.680)			(0.706)	(0.766)
(log) Distance to Capital				-0.0163				-0.00372
				(0.0188)				(0.00774)
Central Kaza Dummy				-0.00788				0.0158
				(0.0181)				(0.0204)
Average Temperature								
Constant	0.820****	1.012****	1.040****	1.233****	0.415****	0.676****	0.799****	0.838****
	(0.0377)	(0.0646)	(0.0746)	(0.234)	(0.0392)	(0.0500)	(0.0715)	(0.118)
Observations	330	329	329	329	330	329	329	329
R-squared	0.184	0.313	0.358	0.367	0.187	0.445	0.485	0.487

Robust standard errors in parentheses

**** p<0.001, *** p<0.01, ** p<0.05, * p<0.1

Robustness Checks

My results show that historical educational competition played a crucial role in shaping regional educational attainment patterns in contemporary Turkey. I interpret my findings as evidence that religious competition leads to an expansion in the provision of public goods, especially in respect to female education. The existential threat of missionaries alongside competition between Protestant and Armenians increased the supply and demand for female education even after missionary and Armenian schools were no longer present. In order to test whether educational competition impacted contemporary economic development through the above specified mechanisms, we need to examine whether its influence can be observed in the short term as well. In this section, I perform various additional analyses to demonstrate that regions with competitive educational environments have higher educational development in the late Ottoman period, as proxied by student enrolment, schooling, and educational attainment rates.

Female Ibtidâî Schools per Capita

If educational competition in the Ottoman Empire stimulated investment in and demand for female education across ethno-religious lines, then we should expect Christian competition to also influence the concentration of Muslim female schooling in the short term as well — that is before the large-scale ethnic violence and displacement in Anatolia. To test this hypothesis, I use information on female ibtidâî schooling data collected from the Ottoman Educational Yearbooks of 1914-1915 (Alkan 2000). These statistical reports contain information on the number of male and female ibtidâî schools, number of people who have reached the compulsory schooling age, alongside figures on the number of

students enrolled at ibtidâî schools, all down to the kaza level.[69] Based on these variables it is possible to calculate the number of female ibtidâî schools per capita.[70] Using female schools per capita as my dependent variable, I investigate whether both Protestant missionary presence and a dynamic Christian educational market are both related to the Ottoman state's investments into female schooling. A comparison across columns in Table 9 shows that missionary stations per capita is the only explanatory variable that is positive and statistically significant. A one unit increase in missionary stations per 1000 people corresponds to around 0.1 percent increase in female schools per capita. More importantly, a one standard deviation increase in the share of Christians in a given kaza is associated with a 3.37 percent increase in the number of female schools per capita. We can see that both the presence of a significant Christian population and presence of missionary stations are both important variables explaining Ottoman investment in female education during its final years.

[69] The data is incomplete for some *kazas*. Only 253/332 of the *kazas* contain information on the number of eligible students and the number of actual students.
[70] I use the total number of females who have reached the compulsory age of schooling as my population figure. Consult the Data Appendix for additional information.

Table 9: Female Ibtidâî Schools and Christian Education

VARIABLES	Model 1	Model 2	Model 3
(log) Population Density (1893)	0.000608	0.000731	0.000938
	(0.0313)	(0.0313)	(0.0313)
Christian Share	0.581***	0.587***	0.536**
	(0.202)	(0.202)	(0.238)
Missionary School per Capita	0.00733		
	(0.0247)		
Missionary Stations per Capita		0.00207*	
		(0.00115)	
Competition Per Capita			0.00847
			(0.00588)
Average Elevation	-0.000184*	-0.000186*	-0.000182*
	(0.000108)	(0.000106)	(0.000107)
Average Precipitation	2.14e-05	2.48e-05	2.68e-05
	(0.000159)	(0.000160)	(0.000162)
(log) Distance to Lake	-0.00149	-0.00152	-0.00150
	(0.00452)	(0.00446)	(0.00447)
(log) Distance to River	0.000813	0.000587	0.000246
	(0.00713)	(0.00708)	(0.00731)
(log) Distance to Port	-0.0107	-0.0106	-0.0110
	(0.0143)	(0.0143)	(0.0144)
(log) Distance to Railroad	-0.0140*	-0.0142*	-0.0142*
	(0.00722)	(0.00727)	(0.00739)
Carriageway Density	3.332*	3.335*	3.289*
	(1.977)	(1.987)	(1.957)
(log) Distance to Capital	-0.0394	-0.0359	-0.0359
	(0.0548)	(0.0530)	(0.0529)
Central Kaza Dummy	0.0435	0.0437	0.0478
	(0.0919)	(0.0920)	(0.0929)
Constant	1.149	1.105	1.110
	(0.731)	(0.717)	(0.715)
Observations	253	253	253
R-squared	0.207	0.207	0.211

Robust standard errors in parentheses

**** p<0.001, *** p<0.01, ** p<0.05, * p<0.1

Female Rüşdiyye School Concentration

Next, I test whether missionary presence or Christian competition is related to the concentration of female rüşdiyye (upper-primary) Ottoman schools between 1901-1919. The data for female rüşdiyye school concentration comes from Selçuk Akşin Somel's (2001) work on the modernization of Ottoman education. As can be seen from Table 10, missionary schools positively effect rüşdiyye concentration, whilst the sign of the coefficient for missionary stations is negative. This mirrors my earlier findings regarding the opposite effect of stations and schooling on the gender parity index for secondary education. That being said, the p-value for both variables is 0.123 and 0.136 and not significant. The only explanatory variable that is statistically significantly related to upper-primary schooling is the number of female missionary schools in given kaza: I find that each additional female missionary school corresponds to around 1.3 percent increase the concentration of female rüşdiyyes. Thus, whilst lower level public instruction was spurred by a general fear of missionaries and the presence of a significant Christian population, we can see that the Porte's strategy in building higher educational institutions for women was partially motivated by the presence of female missionary schools in a given kaza.

Table 10: Female Rüşdiyye School Concentration

VARIABLES	Model 1	Model 2	Model 3	Model 4
(log) Population Density (1893)	0.0550	0.0544	0.0490	0.0535
	(0.0422)	(0.0414)	(0.0398)	(0.0417)
Christian Share	0.305	0.296	0.292	0.371
	(0.425)	(0.422)	(0.423)	(0.460)
Missionary School per Capita	0.0262			
	(0.0173)			
Missionary Stations per Capita		-0.00278		
		(0.00178)		
Female Missionary School			0.0612**	
			(0.0267)	
Competition per Capita				-0.0176
				(0.0112)
Average Elevation	0.000104	0.000105	0.000101	9.35e-05
	(9.98e-05)	(9.91e-05)	(0.000100)	(9.98e-05)
Average Precipitation	-5.47e-05	-6.05e-05	-5.84e-05	-6.71e-05
	(0.000148)	(0.000149)	(0.000147)	(0.000148)
(log) Distance to Lake	0.00651	0.00572	0.00678	0.00558
	(0.00503)	(0.00483)	(0.00504)	(0.00477)
(log) Distance to River	0.00446	0.00434	0.00475	0.00477
	(0.00853)	(0.00848)	(0.00856)	(0.00869)
(log) Distance to Port	-0.0111	-0.0111	-0.0124	-0.0106
	(0.0161)	(0.0162)	(0.0160)	(0.0162)
(log) Distance to Railroad	0.0213**	0.0219***	0.0206**	0.0217***
	(0.00819)	(0.00821)	(0.00813)	(0.00792)
Carriageway Density	-7.969*	-8.060**	-8.311**	-7.884*
	(3.985)	(4.023)	(4.040)	(3.964)
(log) Distance to Capital	-0.422****	-0.422****	-0.421****	-0.420****
	(0.105)	(0.106)	(0.104)	(0.104)
Central Kaza Dummy	0.00932	0.00893	-0.0101	9.35e-05
	(0.0524)	(0.0520)	(0.0547)	(0.0545)
Constant	5.346****	5.349****	5.373****	5.334****
	(1.239)	(1.245)	(1.234)	(1.230)
Observations	331	331	331	331
R-squared	0.489	0.489	0.491	0.494

Robust standard errors in parentheses

**** p<0.001, *** p<0.01, ** p<0.05, * p<0.1

Gender Parity Index for Ibtidâî Schools

In this section, I investigate whether the association between Christian schooling and gender parity index can be observed in the short-term. For these models, I use GPI for ibtidâî schooling in 1914 as my dependent variable. My primary independent variables are missionary schools per capita, missionary stations per capita and competition per capita. It can be seen from the data in Table 11 that both missionary schools and stations per capita are statistically significantly and positively related to a reduction in the gender gap in education during the late Ottoman times. Each additional missionary school per capita corresponds to a 3.58 percent increase in gender parity index, whilst each missionary station per capita equates to 0.5 percent increase. I also find that each competitive dyad is related to a 0.43 percent increase in the gender parity index. However, my results are not significant when I control for Christian share implying that the positive effect of competition on gender parity is in part captured by the share of Christians living in a district.

Table 11: Gender Parity Index at Ibtidâî Schools

VARIABLES	Model 1	Model 2	Model 3
(log) Population Density (1893)	-0.0382**	-0.0371**	-0.0398**
	(0.0148)	(0.0147)	(0.0150)
Christian Share	0.376****	0.384****	0.369****
	(0.0618)	(0.0590)	(0.0657)
Missionary School per Capita	0.0332***		
	(0.0118)		
Missionary Stations per Capita		0.00566****	
		(0.000643)	
Competition Per Capita			-1.94e-05
			(0.00142)
Average Elevation	-0.000126****	-0.000133****	-0.000133****
	(3.19e-05)	(3.18e-05)	(3.27e-05)
Average Precipitation	3.86e-05	4.74e-05	3.78e-05
	(6.34e-05)	(6.24e-05)	(6.32e-05)
(log) Distance to Lake	0.000762	0.000547	0.000384
	(0.00279)	(0.00273)	(0.00274)
(log) Distance to River	0.000798	-0.000190	4.66e-05
	(0.00203)	(0.00204)	(0.00209)
(log) Distance to Port	-0.00341	-0.00334	-0.00337
	(0.00671)	(0.00675)	(0.00670)
(log) Distance to Railroad	-0.00607***	-0.00611***	-0.00553***
	(0.00189)	(0.00185)	(0.00189)
Carriageway Density	3.015**	2.942**	2.984**
	(1.188)	(1.208)	(1.199)
(log) Distance to Capital	-0.0450***	-0.0406***	-0.0434***
	(0.0137)	(0.0122)	(0.0131)
Central Kaza Dummy	0.0190	0.0215	0.0202
	(0.0228)	(0.0232)	(0.0234)
Constant	0.952****	0.901****	0.951****
	(0.221)	(0.204)	(0.216)
Observations	267	267	267
R-squared	0.495	0.508	0.482

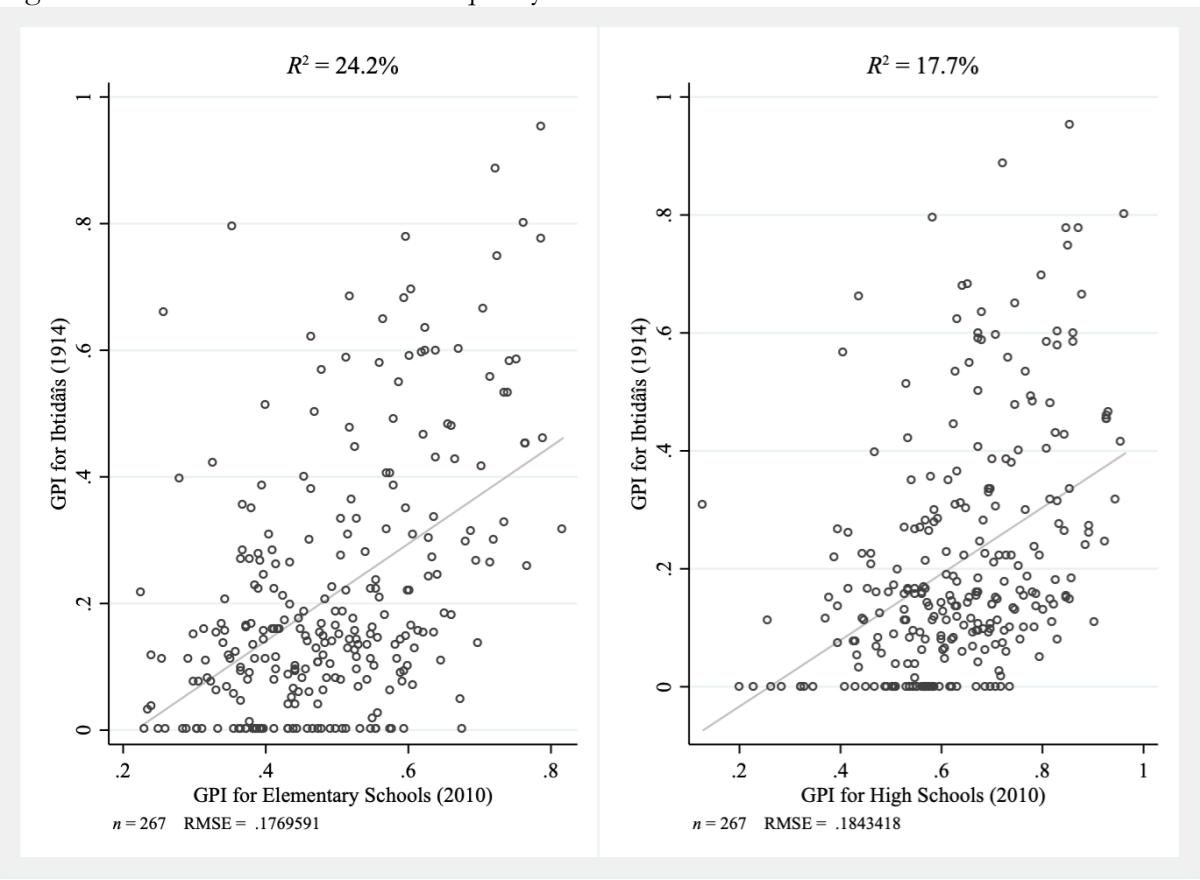
Robust standard errors in parentheses
**** p<0.001, *** p<0.01, ** p<0.05, * p<0.1

Spearman Ranks

Finally, I evaluate the persistence of cross-district variability of gender parity in educational attainment in Turkey. Figure 5 reports the unconditional correlation between GPI for elementary schools in 2010 and GPI for ibtidâîs in 1914. Results suggest a high degree of persistence in subnational differences in the gender gap in education. The regression for the full sample explains 24.2 percent of the subnational variation in gender gap for schooling. The Spearman rank correlation is 0.45 and a test rejects the null hypothesis that schooling variables in the past and today are independent.[71] This evidence suggests that the gender parity in education is highly persistent and that its early and current levels are closely related.[72] Substituting the gender parity index for elementary schools with the gender parity index for high school levels I find largely similar results. The regression for the sample explains about 17.7 percent of subnational variation. The Spearman rank correlation is 0.45; the test also rejects the null hypothesis that both these variables are independent.

[71] As comparison, Huillery (2009) colludes that the degree of persistence of educational institutions in former French West Africa is "strong" when their measures of early colonial investments in education explain about 30 percent of the current educational performance.
[72] When I control for population density and geographical variables, the GPI of Ibtidai schools explains 76 percent of GPI of Elementary Schools and 95 percent of GPI for High Schools.

Figure 5: Persistence of Gender Inequality in Education



Conclusion

Ottoman society offers unique opportunities to untangle the long-run direct and indirect effects of missionaries. Due to the removal of the Armenian population and closure of the majority of missionary schools, we are able to investigate how the remaining Muslim population responded to the intensification of Protestant missionaries' activities during the nineteenth century and whether this reaction had long-term effects. Using a novel historical GIS dataset, I found that missionary presence is negatively related to share of population with a high school degree. I interpret this finding resulting from the negative shock of Armenian expulsions and settlement of Muslim refugees in formerly Armenian villages. And whilst missionary presence had a negative effect on contemporary education, I offer evidence that the existence of multiple Christian educational institutions has a positive impact on total elementary enrolment. In line with the literature on Ottoman education, I postulate that a dynamic Christian educational market shaped the construction of ibtidâî schools. Missionary-triggered competition led to the broadening of educational provision by progressive Ottoman bureaucrats, leading to its greater social acceptability and demand.

More importantly, my results also suggest that both missionary presence and Christian competition generated qualitative changes in Ottoman and Turkish education, leading to the institutionalization of education for all social groups formerly excluded from the educational system. I find that concentration of missionaries and competition are both positive and significant predictors of gender parity at the elementary and high school levels. Protestant entrants into the Ottoman educational landscape had to work extra hard to capture a share of an already established market. As a result of the patriarchal and elitist nature of Ottoman and Armenian education, Protestant missionaries were compelled to target women for conversion. Complementing their focus on marginalized members of

Ottoman Armenian society were Protestant religious principles that prioritized egalitarian notions of social welfare. The native educational institutions thus had to adapt and change to this increasingly pluralizing religious market. Failure to do so meant losing adherents to their faith or placing them under the pernicious influence of American Protestant missionaries.

Previous research has identified a positive relationship between historical presence of missionaries and a host of socio-economic measures. This claim has been put forward without specifying whether such developmental outcomes are the result of direct or indirect effects. Using the unique case of Turkey, I am able to isolate the indirect effects and show that missionary presence is most intimately related to the reduction of gender inequality in education. This suggests that previous findings underlining missionary contributions to overall educational attainment are most likely the result of direct effects such as investments in educational infrastructure and intergenerational transmissions of human capital amongst recipients of the missionary message. Previous research on Turkey has attributed the persistent gender gap in education in Turkey to societal views on gender roles. While I do not dismiss the importance of culture specific explanations to educational development, both my case study and statistical analysis show that missionary involvement may be a powerful factor that altered local perceptions regarding women's education. This is highly significant given the high degree of persistence in the gender gap in education between the late Ottoman and contemporary Turkish periods.

The expansion of public schooling in the Ottoman Empire was part of a much broader phenomenon of worldwide expansion of state education in the nineteenth and twentieth centuries. What set the Ottoman case apart was that it its tenuous freedom from Western colonialism. Suffering multiple defeats at the hands of European powers, the empire attempted at various self-strengthening reforms that targeted the military, bureaucracy and education. Thus, in contrast to colonial territories, the indigenous rulers were significant

actors in the educational sphere. The Ottoman Empire shared this fate with a handful of large and multi-ethnic empires that remained independent whilst also falling under attack from the outside world and from internal opposition. The ruling elites in China, Japan, Siam and the Ottoman Empire saw education as the secret to the West's success and thus critical to safeguarding their own empires' futures. Missionary educators working in these places were seen both as harbingers of reform but also the personification of imperial anxieties over Western intervention into their domestic affairs. Missionaries, moreover, could not rely on colonial governments for protection and faced significant indigenous opposition, especially in places with institutionalized religious practices. These factors combined to produce relatively free educational marketplace where multiple indigenous and foreign actors competed against each other. This competitive environment was an especially fertile ground for indirect effects to flourish. Future research would thus benefit from examining such processes, especially in semi-colonial territories with long-standing histories of statehood.

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Appendix

Variable Definitions

Population Density: Natural logarithm of district population per square kilometer. It is computed using Ottoman and Turkish Censuses and the surface area of each district. The 1893 Ottoman Census is the first census to record men and women according to their millet (religious and ethnic affiliation). Figures are reported for each Ottoman kaza (district). Ottoman kaza (district) borders were manually drawn using ArcGIS. Surface area is calculated using these geocoded polygons. Missing information is filled using provincial yearbooks from the same period. The 1893 Ottoman Census has been transcribed into Latin characters by Karpat (1985). Modern Turkish Census results can be accessed through TurkStat's web application.

Christian Share of the Population (1893): The total number of (male and female) Christians in a given kaza divided by the total population of that kaza. The category includes Greeks, Armenians, Bulgarians, Catholics, Protestants, Latins, and Monophysites. The information comes from the 1893 Ottoman Census.

Number of Missionary Stations: Total number of Protestant missionary stations in a given kaza. The station names are sourced from primary source material located at the Archives of the American Board of Commissioners for Foreign Missions (ABCFM) at Houghton Library. Annual station reports, journals, and letters are consulted to find the exact location of missionary stations. Each name is then linked to a contemporary location using secondary sources. The total number of these stations are calculated for each kaza using spatial computations in ArcGIS.

Number of Missionary Schools: Total number of male and female Protestant missionary schools in a given kaza. The schooling data is sourced from Alan (2015). Each name is then linked to a contemporary location. The total number of schools are calculated for each kaza using spatial computations in ArcGIS.

Missionary Schools per 1000 people: The total number of missionary schools in a given kaza divided by the Christian population of that kaza times 1000.

Missionary Stations per 1000 people: Figures for number of schools per kaza are calculated through spatial statistics in ArcGIS. This number is then divided by the Christian population in each kaza then multiplied by 1000.

Number of Competitive Dyads: Number of Gregorian Armenian schools and Missionary stations within 5km of each other. Each dyad is located using ArcGIS and relies on the latitude/longitude information in my Historical GIS dataset. The total number of these nodes are calculated for each kaza using spatial computations in ArcGIS.

Competition per Capita: The total number of competitive dyads in a given kaza dividen by the Christian population of that kaza times 1000.

Average Elevation: The average elevation of a given district. The primary source is the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Global Digital Elevation Model Version 3 (GDEM 003). The dataset is jointly created by the Ministry of Economy, Trade, and Industry (METI) of Japan and the United States National Aeronautics and Space Administration (NASA). The ASTER GDEM's coverage spans from 83 degrees north latitude to 83 degrees south, encompassing 99 percent of Earth's landmass, with 30-meter posting and 1x1 degree tiles. The raster image for elevation is used to calculate average figures for each kaza using ArcGIS software.

Annual Mean Temperature: The average annual temperature of a given district. The primary source is the CHELSA (Climatologies at High Resolution for the Earth's Surface Areas) dataset. The CHELSA dataset includes monthly mean temperature and precipitation patterns for the time period 1979-2013. The raster image for regional temperature is used to calculate average figures for each kaza using ArcGIS software.

Annual Mean Precipitation: The average annual precipitation of a given district. The primary source is the CHELSA (Climatologies at High Resolution for the Earth's Surface Areas) dataset. The CHELSA dataset includes monthly mean temperature and precipitation patterns for the time period 1979-2013. The raster image for regional precipitation is used to calculate average figures for each kaza using ArcGIS software.

Distance to Nearest Lake: The logarithm of the minimum distance from the centroid of a district (in kilometres) to the nearest major lake. The shape file is downloaded from HydroLakes database (http://wp.geog.mcgill.ca/hydrolab/hydrolakes/) in vector format. The primary source is the HydroLakes database. The spatial computations are made using ArcGIS software.

Distance to Nearest River: The logarithm of the minimum distance from the centroid of a district (in kilometres) to the nearest major river. The shape file is downloaded from HydroLakes database (https://hydrosheds.org/page/hydrorivers) in vector format. The spatial computations are made using ArcGIS software.

Distance to Nearest Major Port: The logarithm of distance of a district (in meters) to the nearest major port. The spatial computations are made using ArcGIS software. The source of this data comes from the 1899 R. Huber Map. The major ports are Constantinople (Istanbul), Dardanelles (Çanakkale), Gallipoli (Gelibolu), Smyrna (Izmir), Silifke, Mersin,

Alexandrette (Iskenderun), Erekli (Karadeniz Ereğli), Inebolu, Sinop, Samsun, Ordu, Dunie, Kiressoun (Giresun), Tireboli, Trebizonde (Trabzon), and Rize.

Distance to Nineteenth-Century Railroad: The distance of a district (in meters) to the nearest railroad. The railroad information is manually traced using the Huber's Ottoman Map and predates the Ottoman investments in railroads in the twentieth-century. Distance calculations are made using ArcGIS software.

Distance to Ottoman Trade Routes: The logarithm of distance of a district (in kilometers) to the nearest Ottoman Trade route. The spatial computations are made using ArcGIS software. The data is downloaded from the Old World Trade Routes (OWTRAD) Project (http://www.ciolek.com/owtrad.html). The OWTRAD project documents 174 data points defining trade routes across the Ottoman Empire and relies primarily Halil İnalcık's work on trade routes between 1300 CE – 1600 CE.

Distance to Carriageway: The logarithm of distance of a district (in kilometres) to the nearest nineteenth-century carriageway (chaussées). The spatial computations are made using ArcGIS software. The source of the data is Huber's Ottoman Map of 1899. Roads are manually traced using ArcGIS software.

Carriageway Density: The magnitude-per-unit area of nineteenth-century carriageways that fall within given kaza. The spatial computations are made using the line density tool in ArcGIS software. The source of the data is Huber's Ottoman Map of 1899. Roads are manually traced using ArcGIS software.

Distance to the Capital Istanbul (Constantinople): The logarithm of distance of a district (in kilometers) to Istanbul (Constantinople) which was the capital of the Ottoman Empire (1299-1922). The spatial computations are made using ArcGIS software.

Central Kaza Dummy: Indicates whether the kaza in question was the administrative capital of a sanjak (sub-division) according to the 1893 Ottoman Census. The primary source I consulted for this information was the historical gazetteer of the Ottoman Empire compiled by Tahir Sezen (2017).

Number of ibtidâî Schools (1914): The primary source for these figures are the Statistical Review of the Ministry of Education (*Maarif-i Umumiyye İhsaiyat Mecmuası*) for the Muslim calendar year of 1336. This report enumerates the number of schools, teachers, students, and those who have reached a compulsory schooling age. The number of ibtidâî schools include both male and female ibtidâî schools.

Female ibtidâî Schools per Capita (1914): The total number of ibtidâî schools in a given kaza divided by the total number of female Muslims in that kaza.

İbtidâî Enrolment Figures (1914): The primary source for these figures are the Statistical Review of the Ministry of Education (*Maarif-i Umumiyye İhsaiyat Mecmuası*) for the Muslim calendar year of 1336. This report enumerates the number of schools, teachers, students, and those who have reached a compulsory schooling age. Enrolment rate is the number of students over the number of people who have reached a compulsory schooling age. The figure is calculated for each kaza.

İbtidâî Gender Parity Index (1914): The ratio of the absolute number female students to male students for the ibtidâî schools for the school year starting in 1914. The primary source for these figures are the Statistical Review of the Ministry of Education (*Maarif-i Umumiyye İhsaiyat Mecmuası*) for the Muslim calendar year of 1336.

Educational Attainment Figures (2010): The share of the population above the age of 15 that has received elementary or high school degree. The education data is obtained from the Turkish Statistical Institute (TÜİK) for the year 2010.

GPI for High Schools (2010): The total number of females above the age of 15 who are enrolled in a high school over the total number of males enrolled.

Supplementary Tables and Figures

Table A.2: Additional Sources Used for Ottoman Population Figures

Name of Kaza	Name of Sanjak	Name of Vilayet	Source
Ahlat Kaza	Bitlis Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Bitlis Kaza	Bitlis Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Hizan Kaza	Bitlis Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Mutki Kaza	Bitlis Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Capakcur	Genc Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Genc Kaza	Genc Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Kulp Kaza	Genc Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Bulanik Kaza	Mus Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Malazgirt Kaza	Mus Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Mus Kaza	Mus Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Sason Kaza	Mus Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Varto Kaza	Mus Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Eruh Kaza	Siirt Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Garzan Kaza	Siirt Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Pervari Kaza	Siirt Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Siirt Kaza	Siirt Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Sirvan Kaza	Siirt Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Carsancak Kaza	Dersim Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Cemisgezek Kaza	Dersim Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Hozat Kaza	Dersim Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Kizilkilise	Dersim Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Mazgirt Kaza	Dersim Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Ovacik Kaza	Dersim Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Arabkir Kaza	Elaziz Sanjak	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Egin Kaza	Elaziz Sanjak	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Elaziz Merkez Kaza	Elaziz Sanjak	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Keban Madeni Kaza	Elaziz Sanjak	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Adıyaman (Hisn-i Mansur) Kaza	Malatya Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname

Akcadag Kaza	Malatya Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Behisni Kaza	Malatya Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Kahta Kaza	Malatya Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Malatya Merkez Kaza	Malatya Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Pülümür (Kuzican) Kaza	Erzincan Sanjak	Erzurum Vilayet	1871 (1288 H.) Salname
Antakya Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Antep Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Bâb Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Belen Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Cebel-i Sem'ân Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Cisr-i Şuğûr Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Halep Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Harim Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Idlib Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Iskenderun Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Kilis Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Mare Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Münbiç Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Rakka Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Andirin Kaza	Maraş Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Elbistan Kaza	Maraş Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Maraş Kaza	Maraş Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Pazarcik Kaza	Maraş Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Zeytun Kaza	Maraş Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Birecik Kaza	Urfa Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Harran Kaza	Urfa Sanjak	Halep Vilayet	1900 (1318 H.) Salname
Rumkale Kaza	Urfa Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Suruc Kaza	Urfa Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Urfa Kaza	Urfa Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Albak Kaza	Hakkâri Sanjak	Van Vilayet	1897 (1315 H.) Salname
Beytussebap	Hakkâri Sanjak	Van Vilayet	1897 (1315 H.) Salname
Çölemerik	Hakkâri Sanjak	Van Vilayet	1897 (1315 H.) Salname
Gevar Kaza	Hakkâri Sanjak	Van Vilayet	1897 (1315 H.) Salname
Hamidiye (Van) Kaza	Hakkâri Sanjak	Van Vilayet	1897 (1315 H.) Salname
Semdinyan Kaza	Hakkâri Sanjak	Van Vilayet	1897 (1315 H.) Salname

Figure A.1: Ottoman Kazas According to the 1893 Census

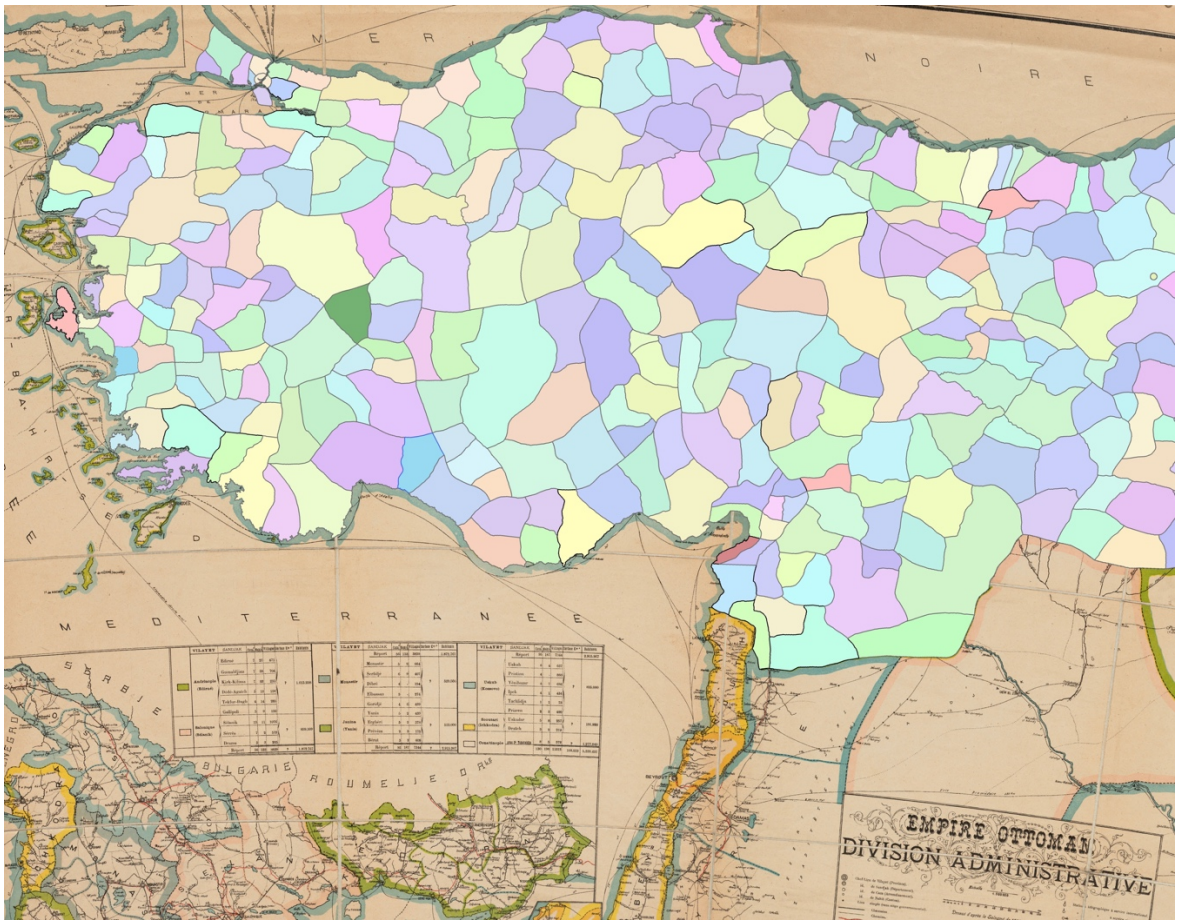
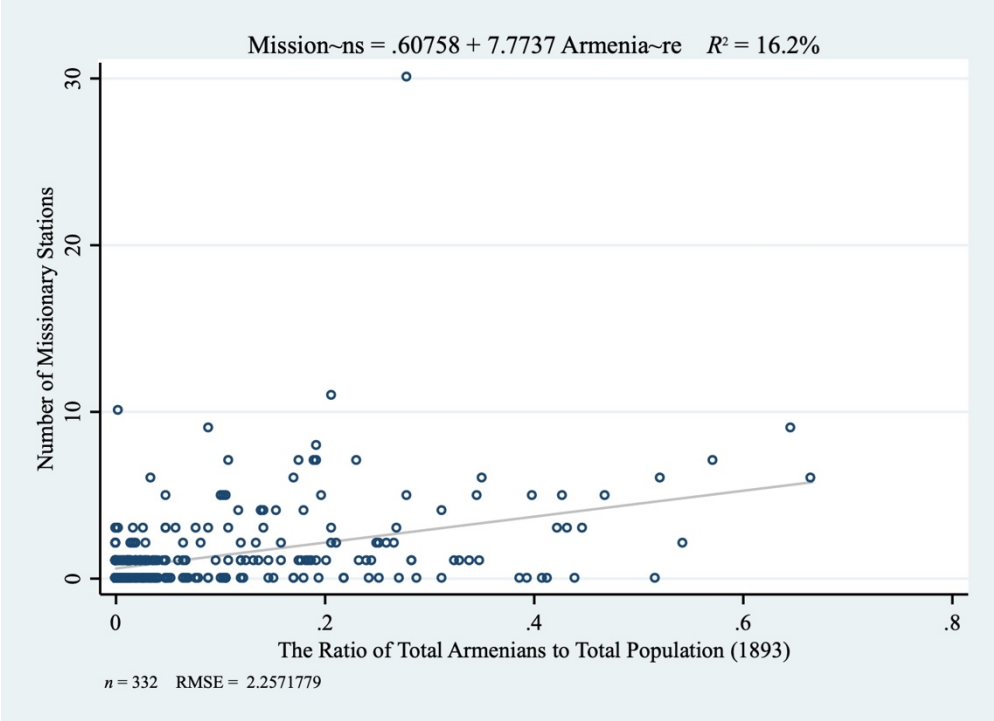


Figure A.2: Share of Armenian Populations vs. Number of Missionary Stations



Article 3: The Long Shadow of Ottoman Educational Competition: A Historical GIS Analysis of Historical Education and its Economic Legacies in Ottoman Turkey

Abstract: A large literature claims a strong and consistent association between historic missionary societies outside Europe and positive long-term socio-economic outcomes. Yet, most of these studies fail to specify whether this finding is the result of missionary investments in human capital or local actors stepping up their educational efforts in reaction to missionary activities. This study uses the Protestant missionary activities in Ottoman Turkey to separate both mechanisms. The Ottoman state and Armenians responded to missionary incursions by modernizing and expanding their education efforts. Moreover, after the foundation of the Republic, the majority of missionaries and Armenian population ceased to exist in modern Turkey. Using the blockage of direct effects, this study confirms the role of indirect effects or emulation has played in Ottoman Turkey. Results show that places with historically heightened competition between missionary schools and native educational institutions are more likely to have higher income, as measured by night-time light density.

Keywords: Historical GIS; Economic Development; Protestant Missionaries; Long-Run Development; Competition; Ottoman Empire; Education

Introduction

History is universally recognized as "mattering" in some way. How and why it matters has come under renewed scrutiny by a dynamic new empirical literature examining historical events as crucial determinants of current social and economic outcomes (see Nunn 2014). A growing number of works within this historical turn highlight a strong and consistent association between historic missionary societies outside Europe and positive long-term socio-economic outcomes. Much of this scholarship claims that missionaries fostered the accumulation of human capital and affected long-term economic development through their investments in schooling, vernacular texts, and book production. Yet, qualitative historical case studies of missionary societies also demonstrate that missionaries spurred local populations to invest more in education as a way to counteract the influence of missionaries (e.g., Deol 2000; Sharkey 2013). Hence, it is not clear whether the established relationship in the literature is the outcome of missionary investments in human capital or local populations who intensified their investments in education as a reaction to missionary endeavours. Separating both effects is a daunting task given the scarcity of historical data. Yet, it is not impossible. One way of separating both influences is to explore the long-term impact of missionary influence in pluralistic educational markets where the direct beneficiaries of missionary educational are no longer present.

The educational landscape of Ottoman Turkey presents us with one such situation. American Protestants gained a foothold in the Ottoman Empire in the 1820s and established a notable number of schools catering primarily to the Ottoman Armenian population. Yet, following the founding of the Turkish Republic, the greater part of missionary schools was forced to shut down.[73] Moreover, as a result of the ethnic violence and population

[73] The 1924 *Law of Unity of Education* (Tevrid-i Tedrisat Kanunu) centralized, nationalized and

movements during the transition from empire to nation-state, the majority of the Armenian population of Ottoman Turkey (Eastern Thrace and Asia Minor) was either killed or displaced. In other words, the two main channels of direct missionary investments – supply of schools and intergenerational transmission of human capital – are blocked, giving us a situation well suited to explore the indirect effects resulting from Muslim reactions to missionary influence.

For this case study, I construct an original historical GIS dataset containing the geocoded locations of Protestant missions, Ottoman government schools, and Armenian community schools that were operational within the borders of modern-day Turkey between the years 1820 and 1914. In line with recent research, I use the district's average satellite-recorded data on night-time light density (i.e., luminosity) as a proxy for district-level economic development.[74] Using this novel dataset, I fail to find evidence that missionary involvement in Turkey is associated with economic development. This is not surprising given that the greater part of the missionary schools and the populations they catered to are no longer present. Rather, it is places that historically had heightened competition between missionary schools and native educational institutions that are more likely to have higher income. These findings allow us to interrogate the established assumptions about missionary presence and historical development. They also provide a theoretical framework for

secularized schooling, rendering the religious education offered at missionary schools illegal. A subsequent law passed in 1931 mandated that Turkish citizens were to only attend Turkish primary schools. As a result, all but four high schools in Ottoman Turkey connected to Protestant missionaries ceased operating.

[74] Satellite-recorded data on nighttime lights from the surface of the Earth are overwhelmingly generated by human activity. In recent years, satellite images of nighttime light density have been used in different socio-economic studies to estimate economic development at the national and subnational level (e.g., Henderson, Storeygard, and Weil 2012; Michalopoulos and Papaioannou 2013). Several studies examining the legacy of missionary societies have also relied on luminosity as a measure of sub-national economic development (e.g., Castelló-Climent, Chaudhary, and Mukhopadhyay 2017).

examining the strategic adaptation of indigenous actors to missionary activities, especially in parts of the world that avoided Western colonialism.

The paper is organized as follows. I begin, in Section II, by describing the conceptual framework underlying the article. This section focuses on missionary investments in human capital and their links to economic development. Section III then traces the development of standardized education for different ethno-religious groups in the Ottoman Empire, paying special attention to how their conflicts and interactions with each other shaped this evolution. In so doing, this section offers qualitative evidence into how missionary activities shaped educational expansion through local reactions and competition. In Section IV, I provide a GIS analysis exploring how missionary educational activities affected economic development. I begin by describing my Geographic Information System (GIS) dataset for Ottoman Turkey. This original dataset combines contemporary survey data, geographic data, and data from historical records as part of one of the first rigorous attempts to develop a GIS dataset for the Ottoman Empire and its successor states. Using this dataset, I report OLS estimates of the relationship between schooling in the nineteenth-century and economic development today, examining variations across districts. In the final part of Section IV, I turn to the issue of causality and mechanisms. Finally, Section V offers concluding thoughts.

Missionaries, Gender Inequality and Economic Development

My proposed causal mechanism linking missionary involvement to modern growth draws on studies of human capital and economic development. Economists have long identified human capital as a key driver of economic prosperity (Schultz 1961). Building on this insight, a growing literature has found that regions with more intense exposure to missionaries have significantly higher levels of economic development (Bai and Kung 2015; Valencia Caicedo 2018; Boateng et al. 2019; Bolt and Bezemer 2009; Castelló-Climent, Chaudhary, and Mukhopadhyay 2017). It has been suggested that the educational institutions established by missionaries in the past proliferated human capital and affected long-term economic development. Such arguments find support from studies showing early educational investments, once established, create substantial inertia in educational levels across several cohorts through a combination of intergenerational transmission of human capital and agglomeration effects (Engerman, Mariscal, and Sokolof 2009; Gallego 2010).

Not all missionary orders had the same impact, though. A number of recent studies demonstrate that Protestant missionaries had a greater impact on female education than Catholic missionaries. Following the principle of *Sola Scriptura*, Protestants sponsored both male and female literacy to enable individuals to read the Bible for themselves. Using data from the first Prussian census 1816, Becker and Woessmann (2008) show that Protestantism is associated with a smaller gender gap in education. Meier zu Selhausen (2019) also demonstrates that enrolment was more equally distributed between the sexes in former British-ruled colonies in Africa and credits Protestant missionaries for this outcome. This line of thinking is corroborated by Nunn (2014) who finds Protestant mission presence during the colonial era Africa benefited the present-day education of women relative to men.

Such findings have important policy implications for contemporary nation states; not only because they demonstrate the origin of social inequalities, but also because empirical studies recognize gender parity in education is significantly and positively related to economic growth (Klasen and Lamanna 2009; Knowles, Lorgelly, and Owen 2002; Benavot 1989). Accordingly, one explanation for the established association between Protestant missionary activities and economic development could be evangelical efforts to expand female education. Scholars propose several different mechanisms for the connection between gender parity and development. Knowles, Lorgelly, and Owen (2002) for example suggest that investments in female and male schooling have declining marginal returns; hence, a more balanced distribution will produce higher GDP per capita. Others argue that reducing gender inequality in education may also cut down fertility (Benavot 1989). The argument being that this would lead to a reduction in population growth and an increase of investment, both of which would promote economic growth. Finally, women are more likely to devote their resources in education and health of their children; thus, a mother's education can be much more consequential for the expansion of education for the next generation (Currie and Moretti 2003).

In missionary studies, moving beyond the simple recognition of denominational difference, some researchers have also begun to acknowledge that the rivalry between Catholic and Protestant missionary orders may play a key role in determining long-term socio-economic outcomes. Trejo (2009) for example, finds that religious competition between Catholic and Protestant orders is a strong predictor of contemporary indigenous mobilization in Mexico. Gallego and Woodberry (2010) illustrate how the educational activities of missionaries were more productive in places where multiple missionary orders were allowed to vie for the conversation of native people. Anecdotal evidence suggests that parents considered the quality of mission schools when deciding where to send their

children (Berman 1974). As a result, the available evidence suggests competition fostered innovation, as both sides were incentivized to adopt educational technologies introduced into the schooling system (Bassey 1999).

Although past studies have identified interdenominational rivalry as an important intervening factor, the competition between indigenous actors and missionaries has been seldom addressed in quantitative studies of missionary societies. As a result, scholarship endorses a narrative that characterizes local populations as passive recipients of missionary technologies. One study that accounts for local actors is Lankina and Getachew (2013), who demonstrate that competition between different religious groups in Kerala triggered the expansion of the provision of female education by native actors. This shows that the emulation or reflex dynamic identified in studies of interdenominational Christian Competition can be extended to indigenous educational actors. Single country case studies of missionary societies in places with long-standing histories of statehood also support this view and draw attention to the conflict between missionaries and indigenous actors. Most such studies recognize that the educational, voluntary, and political organizations established by the Protestants encouraged native communities to form their own organizations (Deol 2000; Dunch 2001; Sharkey 2013).

These studies show that competition or emulation is a potentially important and neglected pathway through which missionaries could have given rise to local human capital. Yet, the greater part of the literature emphasizes what I call direct effects, that is a range of activities that spawned human capital via immediate contact with missionaries. The arguments falling under this heading most commonly emphasize diffusion of useful knowledge (Bai and Kung 2015; Cagé and Rueda 2016; Waldinger 2017) and investments in schooling infrastructure (Calvi, Mantovanelli, and Hoehn-Velasco 2019; Bolt and Bezemer 2009; Castelló-Climent, Chaudhary, and Mukhopadhyay 2017; Waldinger 2017; Wietzke

2015) as the two key mechanisms by which missionaries impacted long-run economic development.

As discussed above, a number of studies have also begun to recognize indirect channels, specifically the role of competition or emulation in popularizing educational innovations introduced by Protestant missionaries to broader segments of the population (Lankina and Getachew 2013; Gallego and Woodberry 2010; Woodberry 2012; Trejo 2009; Woodberry and Shah 2004; Wantchekon, Klašnja, and Novta 2014). To date, there has been no attempt to measure the effects of these two channels separately. One reason for this is that it is often hard to disentangle the direct effect of missionary education from the indirect due to the scarcity of historical data. One way to do so is exploring the consequences of missionary activities in places where missionaries and their target populations are no longer present.

The present article examines whether educational competition in the Ottoman has legacies for subnational variations in economic development in Turkey today. The competitive Ottoman school system popularized education and incentivized indigenous actors to copy the pedagogic innovations introduced by Protestant missionaries, and thereby, could have contributed to the proliferation of human capital and subsequent growth. The Armenian Patriarchate and Ottoman state fought the efforts of Protestant missionaries by expanding efforts to modernize their school systems and bring education to the masses. Similar to other parts of the world, missionaries popularized and advanced the cause of educating women across religious lines (Alan and Bolat 2011). In improving the gender parity in education, they might also have contributed to greater development.[75]

[75] Yumusak, Bilen, and Ates (2013) find that gender inequality between 1968-2006 hindered economic development in Turkey. I investigate this link further by taking a longer-term view of consequences of gender inequality.

A study of missionary activities among Ottoman Armenians provides particularly powerful insight into potential indirect effects because of the subsequent elimination and removal of the Armenian population. Indeed, with the disappearance of the Armenian population, any direct effects missionaries had on economic development through human capital formation also disappeared. Yet their indirect effects potentially persisted despite the purge of the bulk of the Armenian population and closure of the majority of missionary schools. This is because similar to the Armenian Patriarchate, Ottoman authorities felt threatened by missionaries, and Ottoman-state schools responded to the incursion of the missionaries. Public education was standardized and expanded to the provinces as a reaction to both the comparatively superior quality of missionary and indigenous Christian education (Deringil 1998; Fortna 2002). A second reason is that many of the abandoned Armenians properties were used to compensate for the inadequacies in the educational supply of Muslim schooling following episodes of ethnic violence that killed and displaced much of the Armenian population.[76] This included not just the school buildings or monasteries but also school benches, blackboards, book cabinets and even paper and pens. Thus, many of the Armenian schools built to counter Protestant missionary efforts were, in effect, turned into government schools. In this way, missionary-triggered competition also equipped the Ottoman and Turkish state with additional education resources. I explore these potential causal mechanisms in the historical background and statistical analysis sections that follow.

[76] The regulation of November 8th 1915 governing abandoned property (Emval-i Metruke) stipulated that the right of use of any of building or object connected to education left from Armenians would be given to the Ministry of Education (Üngör and Polatel 2011).

Historical Background

The Ottoman Empire experienced growing foreign intervention into its domestic affairs throughout the long-nineteenth century. Empowered by capitulations and unequal treaties, Western powers penetrated deep into the Ottoman lands and established a staggering number schools catering to indigenous non-Muslim communities. One of the most significant entrants into this Ottoman thriving educational landscape was Protestant missionaries of American Board of Commissioners for Foreign Missions (ABCFM). Inspired by the evangelical zeal of the Second Great Awakening (1795–1810), the ABCFM opened its Middle Eastern chapter with the aim of converting Muslims and Jews of the Holy Land. These early attempts, however, were unsuccessful and led to a reappraisal of original goals and a reorienting the Board's evangelizing efforts towards Ottoman Armenians. The American Board concentrated on printing-, educational-, and health-related investments to convert local populations. Yet, proselytizing efforts ran into significant obstacles due to the mass illiteracy in Ottoman society and ultimately forced the missionaries' hand in prioritizing their educational work (Dwight 1850: 22, 30).

When ABCFM missionaries first started surveying Ottoman territories, they encountered a localized and rudimentary educational system devoid of most contemporary developments in pedagogy (Smith and Dwight 1834: 65). Schooling for women was practically non-existent, and the few centres of learning that were in operation served to train religious officials. Thus, when the first Protestant missionary school in the Capital opened in 1834, it was the foremost institution to offer a "variety of learning as eastern and western languages, with arithmetic, bookkeeping, geography, zoology, physics, astronomy, and theology" (Arpee 1909: 97). Over the next decades, the missionaries introduced a host

of educational innovations into the Ottoman education system such as Lancaster method, science laboratories, programme for girls, co-education, and kindergartens (Stone 1984).

The ABCFM began occupying centres of Armenian populations in the interior of the country starting in the 1830s, and built an expansive network of schools structured at various levels over a short span of time. By the turn of the century, the Board had an impressive 132 high grade and 1,134 lower schools with a total of 60,964 under instruction in Asiatic Turkey (1904). The rapid expansion of missionary schools was met with resistance by both the Armenian Apostolic Church and the Ottoman state.[77] But they also forced these indigenous actors to step up their educational works in order to match the foreign competition. Commenting about educational development in Asia Minor, Elias Riggs writes:

> Armenians, Greeks, and Jesuits vie with one another in setting before ambitious youth the glittering advantages of their several school systems. Sweeping reforms have been introduced into the national educational organizations, and numerous crude efforts have been made in the line of private schools. But beyond all competition the first place in the scale of excellence and success is assigned, though unwillingly, to the schools established by the American Protestant Missionaries, or under their influence and guidance by natives. This is grudgingly but inevitably acknowledged by even the public officials and jealous ecclesiastics, albeit with sundry grindings of the teeth and muttered imprecations (Riggs 1886).

[77] See Figure A.7 in the Appedix for a histogram depicting the distribution of the establishment of missionary stations.

Armenian ecclesiastical authorities made sure that missionary influence was counteracted through the construction of new Gregorian schools.[78] According to a survey conducted by the Armenian Patriarchate, there were only 115 schools located in the provinces in 1834 (Young 2001: 97). Under the influence of the Tanzimat Reforms, and partially in reaction to missionaries, this number would quadruple over the next 40 years. As one missionary notes, Protestant schools exerted a "reflex influence on the Armenian schools, increasing both their number and their value." (ABCFM 1861: 304).

Most of these educational institutions have not survived to the present day. On the eve of World War I, the Armenian community possessed 1,996 schools with around 173,000 students (Kévorkian and Paboudjian 2012: 64). Today, there remains no functional Armenian schools in Turkey outside Istanbul.[79] After 1915, a good number of Armenian schools were commandeered under the Law of Abandoned Properties (Emval-i Metruke) and transferred to the Ministry of Education (Üngör and Polatel 2011).[80] The Turkish Republic capitalized on the consequences of Armenian-Protestant rivalry by usurping "abandoned" Armenian schools. Hence, missionary-led competition furnished the Turkish state with additional

[78] Missionary labours amongst the Armenian community was met with concern by ecclesiastical authorities. Protestants were extreme in their theological critique of Gregorian traditions and practices. They challenged the unifying power of the Armenian Church and threatened to cut into its valuable tax base. Thus, beginning in 1839, the Armenian Patriarchate started issuing a series of anathemas barring members of the Gregorian Church who were known to have dealings with Protestant missionaries (Dwight 1850: 186–88). In the context of the ecclesiastic-civil organization of the millet system, these bulls translated into a loss of all rights, legal status, and total banishment for the emergent Protestant community.

[79] According to a 2012 survey, there are 16 Armenian schools in Istanbul with approximately 3,000 students (Polatel et al. 2012).

[80] To give one example, an Educational Inspection Review conducted in the province of Mamuratülaziz in the year 1916 found that 13 out of the 62 schools inspected during the period in question were built on property left over from Armenians (Gençoğlu 2014). Due to insufficient data, it is not possible to ascertain the nation-wide percentage of Armenian properties that was converted to Turkish schools. Yet, archival evidence suggests that confiscation and repurposing of Armenian schools as public educational institutions was not an isolated phenomenon and occurred regularly across the country (Üngör and Polatel 2011: 70–71, 82–83, 121, 125, 131, 145; Durmaz 2015: 845).

educational resources and accordingly could have resulted in a larger generation of human capital and economic growth. This is one way in which educational competition could have legacies for contemporary development. Rivalry in the school system also had implications for the expansion of Ottoman public education. The Ottoman state was an active player in the educational system and had to adapt to the incursion of Protestant missionaries and differential modernization taking place between its Muslim and Christian subjects. This next section will outline how the Porte responded to both challenges.

Ottoman Reactions

During the Tanzimat Period (1839–1876), education took centre stage as a tool to reform society, and a way to socialize the population into the newly inaugurated idea of Ottoman citizenship. Despite the financially precarious position the Ottoman Empire found itself in the nineteenth-century, the imperial bureaucracy mobilized a great deal of resources to realize its educational vision. These initiatives culminated in the 1869 Regulation of Public Education (Maârif-i Umûmiyye Nizâmnâmesi, RPE), a watershed moment in Ottoman attempts to institute an empire-wide compulsory modern public education system (Somel 2001). The 1869 RPE systematized previous efforts, and called for a centrally planned Ottoman education system that separated schooling into five distinct tiers: 1) *sıbyan/ibtidâî* (primary), 2) *rüşdiyye* (upper primary), 3) *idadîye* (secondary school), 4) *sultanîye,* and 5) âliye. According to the plan, schools of the first three levels were to be opened in each village, town or quarter of a stipulated population, while *sultanîyes* were to be present in each vilayet capital (Evered 2012: 205–46).

The Ottoman public education system that crystallized in the latter half of the nineteenth century was a partial imitation of, and reaction to the American facilities (Deringil

1998: 112–34; Fortna 2002).[81] The first generation of missionaries were welcomed by the Ottoman state as respected educations. During the 1830s, missionary Rev William Goodell aided the establishment of Lancaster-style schools[82] for the Ottoman military by providing them with the appropriate curriculum, textbooks and other essential materials (Stone 1984: 47; Aksu 2008). The amicable relationship between the American Protestants and the Porte began to deteriorate, however, in conjunction with the remarkable missionary expansion over the course of the second half of the nineteenth century. The Ottomans started to suspect these schools for the roles they played in inciting local populations to rebellion. On top of this, the Ottoman state was worried Muslims were falling behind non-Muslim subjects in matters of education. The missionary schools provided a higher quality of education, and thus were successful in attracting many Ottoman subjects. Provincial governors frequently lamented the incursion of missionaries and urged the central government to intervene to curtail missionary activities. Prominent Ottoman reformer Midhat Pasha's evaluation of the condition of education in Syria is representative of the anxieties of state officials of the time:

> Whereas, on the one hand, the non-Muslims acquire a solid knowledge of crafts and literature in the various French, British and American schools, on the other hand, the Muslim population constituting about 80 percent of the population in the province is left in ignorance…In some of the towns there is only an old secondary school, but no primary schools, let alone any higher-level institutions (quoted in, Sakaoğlu 1985: 481).

[81] The 1869 Regulation of Public Education not only formalized public education in the Empire, it was also an attempt to control missionary institutions as it stipulated that all foreign schools had to submit their curricula and teachers to public inspection.

[82] These types of schools were founded in England during the eighteenth-century by schoolmaster Joseph Lancaster (1778-1838). The schools operated on the principle of using brighter students as monitors to teach fellow pupils. The Lancaster system was adopted as a cost effective way of teaching a large number of students.

The Ottoman government tried to contain the growing presence of missionary activity in the Empire by requiring all foreign schools to carry permits and to submit their curricula and teachers to public inspection (Şahin 2011). Yet, the realization on the part of the Government that they could not close down all the missionary schools led to a concerted effort for the improvement of the quantity and quality of Muslim schools (Alan 2008: 388; Deringil 1998: 131). In 1905, the governor of Beirut wrote that the only way to, "ensure that Muslim children are saved from the harmful clutches of the Jesuits and Protestants [in this city] is for there to be established a network of modern schools capable of competing with them" (quoted in, Deringil 1998: 131). The next section will investigate whether this rivalrous dynamic has long-lasting socio-economic ramifications.

Statitical Analysis

To systemically examine how Ottoman-era educational competition may have had long-term impacts on economic development, I construct a district-level dataset that allows me to exploit the spatial variation in the development of education in Ottoman Turkey for the period 1820–1914. Spatial analysis techniques are an increasingly popular tool in examining the impact of historical missionary societies on modern societies (e.g., Calvi and Mantovanelli 2018; Waldinger 2017; Castelló-Climent, Chaudhary, and Mukhopadhyay 2017). This method is particularly instrumental to understanding the legacies of historical institutions because it allows researchers to combine spatial representation of substantive information from diverse periods. In the remaining section, I will describe the variables I employ in my empirical analysis.

Data

1893 Census and Administrative Divisions

The first step of my data creation process started by transcribing Ottoman census data, creating geographic component of the administrative boundaries and linking both these sections through ArcGIS software. My population data is obtained from the Ottoman Census conducted between 1881 and 1893 (Karpat 1985). I exclude both regions that fall outside of modern national boundaries of Turkey and the Sanjak of Kars, which was occupied by Czarist Russia between 1878 and 1918.

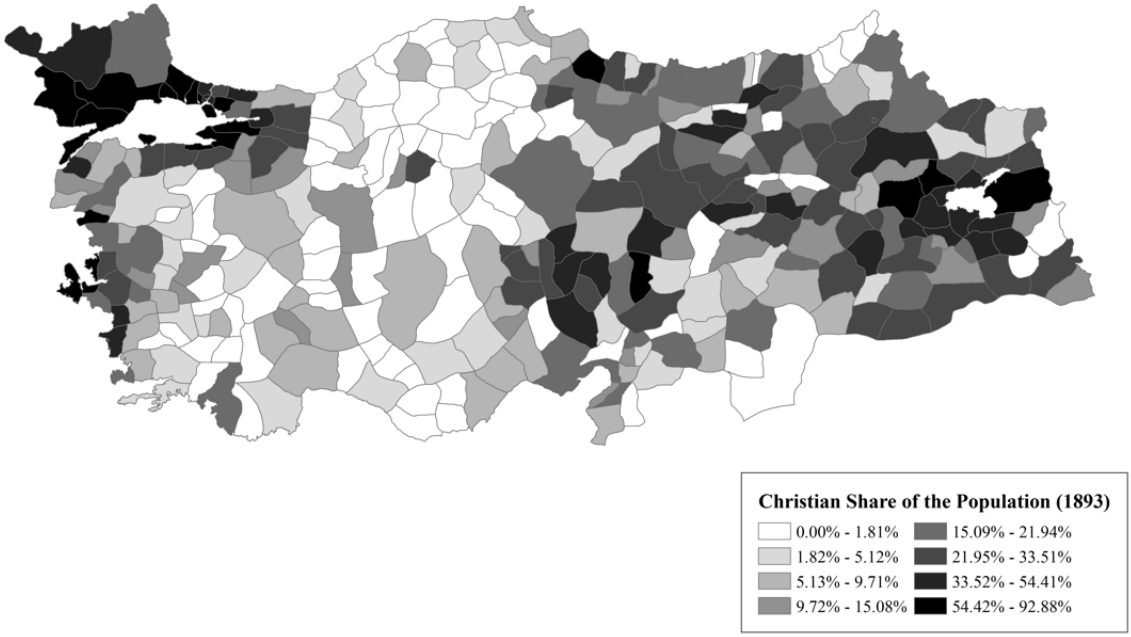
It should be noted that the Ottoman Census, as with any historical survey, is susceptible to and includes errors whether during tabulation or collection. Yet, despite these errors, the data contained within the 1893 Census is recognized as the most reliable population figures of the nineteenth century (Elibol 2007; Karpat 1985). It is the first census

to count both males and females and predates the episodes of large-scale violence that drastically altered the ethno-religious make-up of the region. The questions asked by enumerators during these years provide an invaluable demographic resource for the time, detailing the gender and ethno-religious structure of the population within each district or kaza.[83] I sort my data into the three spatial levels used in the 1893 Census: (1) *vilayet* (province), (2) *sanjak* (subprovince), and (3) *kaza* (district). Arbatli and Gokmen (2018) find that Christian share of the population is correlated with economic development in Ottoman Turkey; accordingly, I generate a value for each kaza and control for this variable in my statistical analysis.

This demographic data is compounded by geographic information from a political map of the Ottoman Empire produced by R. Huber (1899). The original map was created using modern surveying methods and displays, among other things, administrative divisions, railways, carriageways, and major ports of the Ottoman Empire. I georeferenced the digitized image of the map to the surface of the earth and fitted it to a modified "TUREF / LAEA Europe" coordinate system. Based on this, I manually traced the *kaza* borders in ArcGIS and generated 332 boundary shapefiles linked through an upward hierarchy of census geography to *sanjak* and *vilayet*. Figure 1 presents the share of the Christian population in Ottoman Turkey according to the administrative district boundaries of the 1893 Ottoman Census.

[83] There a few districts in the 1893 Census where the population information is unavailable. In order to complete this missing information, I rely on vilayet salnames (provincial yearbooks) that were produced around the same period. Consult Table A.3 in the Appendix for a full list of salnames used.

Figure 6: Christian Share of the Ottoman Population (1893)



Historical School Data

Protestant Missionary Stations and Schools

The main source of information on the locations of Protestant missions in Ottoman Turkey are annual reports, letters and diaries housed at the ABCFM archives at Houghton Library. Based on individual station names, I find the exact geographic coordinates of Protestant missions with the help of a few sources. If the mission station has become a present-day locality, I find its geographic coordinates using online geocoding tools. More often, former missions have changed their names or ceased to exist. The missionaries predominantly operated in Armenian villages and the names of these villages were altered during various nation-building attempts in the late Ottoman and Turkish Republican periods. In these cases, I consulted Kévorkian and Paboudjian's encyclopedic work – 1915 Öncesinde Osmanlı'da Ermeniler [Armenians in the Ottoman Empire before 1915] – which includes maps, locations, and names of Armenian villages during the Ottoman-era. In addition, I also

consult Index Anatolicus (*https://nisanyanmap.com/*), an online map that catalogues current and historic places names within the borders of Turkey. Using both these sources, I successfully geocoded 420 historical mission stations and out-stations, corresponding to around 97 percent of missionary stations referenced in ABCFM annual reports.

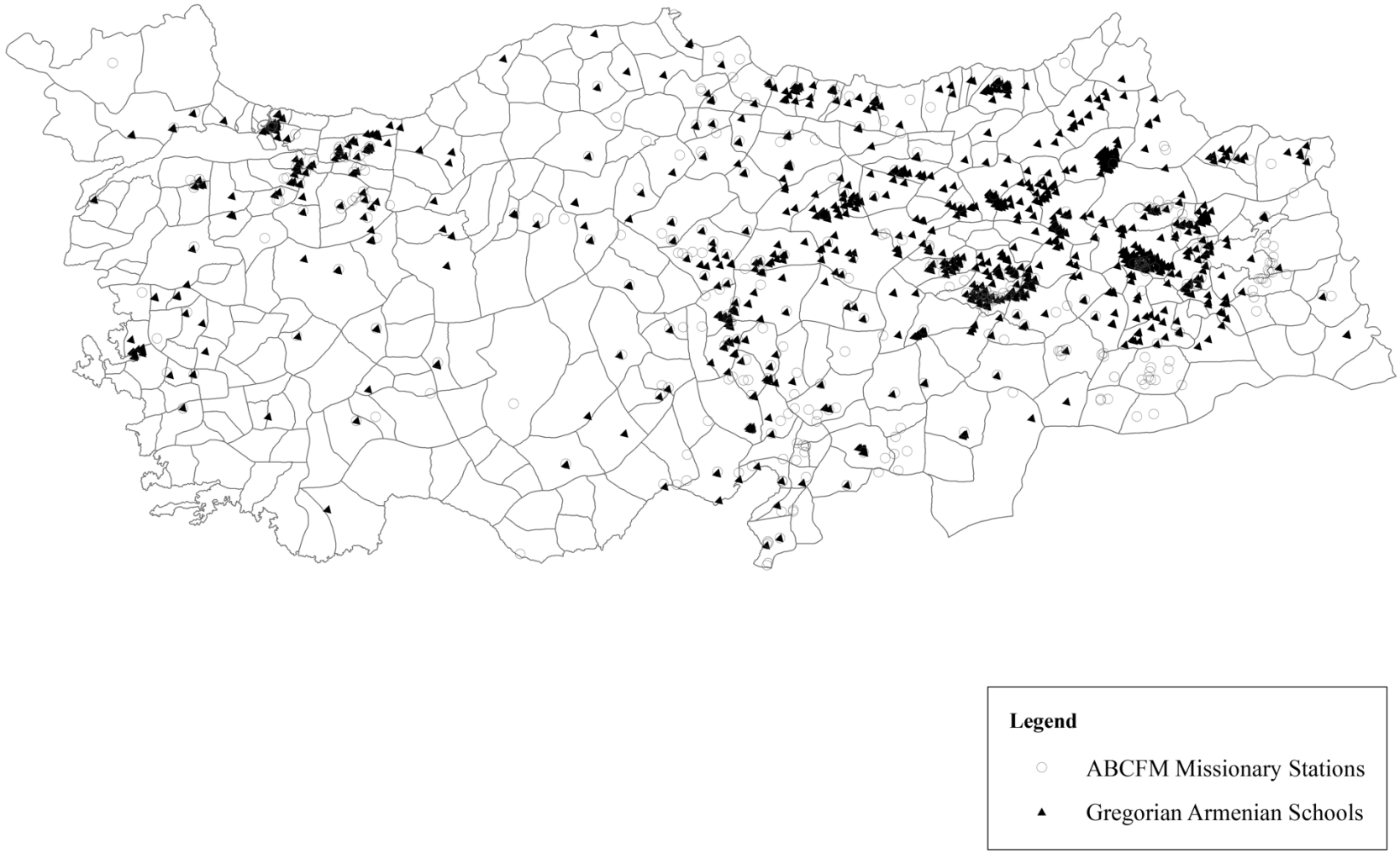
In order to separate the impact of missionary educational activities from their evangelical work, I also collect data on the number of missionary schools. The main source of this data is Gülbadi Alan's (2015) work on American Protestant schools in the Ottoman Turkey. Based on the information described above I calculate two alternate measures of missionary presence for each kaza: missionary schools per capita and missionary stations per capita. In all my school concentration measures, the reference population is the group of people targeted by each institution.[84]

Gregorian Armenian Schools

The main source of information on locations of Armenian schools comes from the Cultural Heritage Map of Turkey created by the Hrant Dink Foundation.[85] The online map relies on primary and secondary sources to chart the locations of Ottoman era non-Muslim public buildings, including, churches, schools, monasteries, cemeteries and hospitals. Based on this map, I record the geocoded locations of 1252 Gregorian Armenian schools built during the Ottoman period. Figure 2 shows the locations of all ABCFM missionary stations and Gregorian schools contained within the borders of modern Turkey

[84] This is the non-Muslim population for missionaries, the male and female Muslim population for Ottoman schools and Armenian population for Gregorian schools.
[85] https://turkiyekulturvarliklari.hrantdink.org/en.

Figure 7: Locations of ABCFM Missionary Stations and Gregorian Armenian Schools



Ottoman State Schools

During the late nineteenth-century, several models of Ottoman schools emerged. The most widespread state institutions were the ibtidâî (modern primary) schools and rüşdiyye (advanced primary) schools. The data for Ottoman state-run schools are drawn from two main sources: 1) The 1914–1915 Ottoman Educational Yearbook, which reports the number of male and female ibtidâî schools down to the kaza-level, and 2) Selcuk Aksin Somel's (2001) work on the modernization of Ottoman education which includes data on the distribution of male and female rüşdiyye schools for each kaza at sanjak level. Based on these two sources, I calculate four independent variables: 1) male ibtidâî schools per capita (1914), 2) female iptidâî schools per capita (1914), 3) average distribution of male rüşdiyye schools (1902-1908), and 4) average distribution of female rüşdiyye schools (1902-1908).

Competition Measure

In order to capture the intensity of competition between different types of schools, I rely on the Herfindahl-Hirschman Index (HHI). The HHI is one of the most commonly used indicators to represent market concentration. The HHI is preferable over other proxies of competition given that it accounts for the number of actors in a market, as well as their concentration by incorporating the relative market size of all actors in a given market. It is calculated by squaring the market share of all actors in a market then summing the squares, as follows:

$$H = \sum_{i=1}^{N} s_i^2$$

Based on this formula, I calculate three HHI indices: one for Christian Competition (Armenian vs. Protestant), one for Imperial Competition (Ottoman vs. Protestant), and a final one for Total Competition (Ottoman vs. Armenian vs. Protestant). Higher numbers on

the HHI indicate less competitive or monopolistic market arrangements whilst lower numbers indicate more competitive market situations.[86]

Outcome Measure

A key challenge to conducting subnational analyses of development is the paucity of economic indicators at a highly localized level. To circumvent this issue, I rely on satellite imagery of light density at night (i.e., luminosity), a metric that recent work by Henderson, Storeygard, and Weil (2012) has suggested is a reliable proxy for income.[87] This technique also has the added advantage of calculating current economic levels for administrative boundaries that have altered over time. The luminosity data is recorded worldwide by the Operational Linescan System flown on the Defence Meteorological Satellite Program (DMSP) satellites. The data is available online from the US National Oceanic and Atmospheric Administration (NOAA). I aggregate luminosity in the year 2000 across all pixels within Ottoman kaza boundaries. I then divide total luminosity by district area to calculate average light density for each district.

Control Variables

An important concern regarding the validity of quantitative studies of missionaries is that numerous factors may have affected both the missionaries' decision to establish a mission in a specific location and the locations' long-term developmental potential. I therefore include a host of control variables to account for potentially exogenous drivers of

[86] See Figure A.4 for the subnational variation of the Christian Competition Index for Ottoman Turkey.
[87] See Figure A.5 in the Appendix for an image of night-time lights for Turkey in year 2000. Figure A.6, on the other hand, plots log average GDP of each district against its log average luminosity.

subnational development. In my results tables, control variables can be grouped into four broad categories: geographic, climate, transportation, and political characteristics.

Geographic controls include distance to the nearest river, to the nearest lake, and altitude. Climate control variables are mean temperature and precipitation patterns for the period 1979–2013. Due to the fact that temperature and precipitation patterns are often correlated with each other, I include them separately in my models.[88] It is also possible that transportation networks play a significant role in defining the missionaries' location decisions. Areas with well-developed transportation network are more likely to be targeted by the early missionaries as more accessible. To take this into account, I use the information in the Huber map to construct variables measuring the districts' access to railways, carriageways and major ports as of 1899. I also control for historical trade routes and include a measure for the distance to the Anatolian Silk Road (circa 1200–1400 CE) as well as the distance to Ottoman trade routes (circa 1300–1600 CE). Finally, location relative to places of political importance can affect economic prospects. In the case of the Ottoman Empire, missionaries, who embarked from Istanbul might have been more likely to select a site for a mission based on proximity to the Ottoman capital. In addition, administrative capitals of subprovinces might have made missionaries more likely to establish a mission there. I therefore control for these variables. See Table 12 for the descriptive statistics of all variables used in my analysis.[89]

[88] Substituting one for the other did not alter my results. Thus, I exclude the Models containing average temperature from my result tables.
[89] Data sources are discussed in further detail in the Appendix.

Table 12: Summary Statistics

VARIABLES	N	Mean	SD	Min	Max
(log) Luminosity	330	1.252	0.991	-2.140	4.141
Christian Share of the Population (1893)	332	0.171	0.190	0	0.929
(log) Population Density (1893)	332	2.702	1.104	-8.178	9.120
Number of Missionary Stations	332	1.244	2.461	0	30
Number of Missionary Schools	332	0.916	3.689	0	59
Number of Female Missionary Schools	332	0.105	0.685	0	11
Missionary Schools Per Capita	332	0.188	0.926	0	12.14
Missionary Stations Per Capita	332	0.725	5.274	0	90.91
Male Ibtidâî Per Capita	253	2.385	1.801	0	14.43
Female Ibtidâî Per Capita	253	0.387	0.466	0	3.333
Total Ibtidâî Enrollment (1914)	252	20.10	15.60	0	113.1
Male Rüşdiyye School Concentration (1902-1908)	332	1.187	1.154	0.160	7.500
Female Rüşdiyye School Concentration (1902-1908)	332	0.210	0.725	0	4.500
Christian Competition Index	332	0.924	0.161	0.500	1
Imperial Competition Index	332	0.866	0.171	0.500	1
Total Competition Index	273	0.771	0.224	0.341	1
Number of Male Students at Ibtidâîs (1914)	274	699.8	1,014	0	8,847

Number of Female Students at Ibtidâîs (1914)	274	183.5	475.3	0	4,005
GPI for Ibtidâî Enrolment (1914)	267	0.213	0.203	0	0.953
GPI for Literacy (1927)	306	0.714	10.05	0	176
GPI for Primary School Enrolment (1937)	319	0.420	0.212	0.0405	1.200
Average Temperature	332	115.7	33.23	30.29	190.9
Average Precipitation	332	646.1	211.8	316.5	2,085
Average Elevation	332	1,029	604.0	12.68	2,569
19th Century Road Density	332	0.0131	0.0128	0	0.0637
(log) Distance to Lake	332	3.264	4.430	-0.283	10.95
(log) Distance to River	332	7.054	4.882	0	12.27
(log) Distance to Capital	332	12.85	1.572	0	14.13
(log) Distance to 19th Century Train	332	10.08	4.676	0	13.83
(log) Distance to Port	332	10.83	2.835	0	13.17
(log) Distance to Ottoman Trade Route	332	4.243	4.814	0	11.55
Central Kaza Dummy	332	0.172	0.378	0	1

Endogeneity

Despite the extensive controls included in my models, endogeneity can still be a concern for geographical analyses of long-term effects of missionary orders. It is possible, for example, that more developed regions attracted more Protestant activity in the past, and that these regions continue to perform better in the present. Scholars have most commonly tried to address this issue by controlling for correlates of development, placebo-type tests, or creating instrumental variables.

Anecdotal evidence suggests that endogeneity is not as large of a problem for the region of Turkey as it is for other parts of the world.[90] The locations of missionary stations were primarily driven by opportunities for conversion, which was based most commonly on the number of Christians, especially Armenians, in a given locale (see Smith and Dwight 1834: 101). Early missionary efforts did focus on more accessible and prosperous coastal towns; however, especially after the 1850s, American missionaries turned their attention to the relatively impoverished Eastern Vilayets where the majority of Armenians lived.[91] The Eastern Vilayets were historically (and continue to be) underdeveloped due to the uneven development of Ottoman and later Turkish capitalism. The landlocked interior had harsh climatic conditions, were devoid of roads and railroads and thus lacked the means to export the agricultural and mineral goods it produced (Clay 1998: 1).

On the other hand, the most developed and populous maritime provinces of Aydin and Istanbul occupy only 2.1 and 1.8 percent of total number of stations in my sample.

[90] My historical data confirms this qualitative account. Using as population density in 1893 as my dependent variable, I find that missionary stations were much more likely to be established in relatively scarcely populated regions.

[91] According to the 1893 Census, Ottoman Anatolia was divided in 15 provinces. The six Eastern Provinces of 1893 accounted for 52.3 percent of all stations and outstations in my dataset.

Despite expending large sums of money, the missionaries lamented how their proselytizing endeavours bore little fruit in important port cities like Smyrna (Greene 1872), Constantinople (ABCFM 1869) and Trabzon (ABCFM 1853: 105). According to missionary archives, efforts to attract and hold converts in these places encountered "powerful obstacles" because of the "worldliness, dissipation and irreligion" (ABCFM 1853: 105) that characterized such maritime towns. This stood in stark contrast to the favourable picture painted of the inhabitants of the rural regions, who were portrayed as more open to the gospel message given that they possessed "simplicity of faith, conscientiousness, an eagerness for the truth, and an eagerness to impart it to others" (ABCFM 1859).

OLS Estimates

Historical Education and Luminosity

In this section, I assess the relationship between historical educational institutions and the log of light density at night as my measure of development. My baseline specification in given by:

$$y_k = \alpha(School_x)_k + \delta ln(PD_{1893})_k + \beta X_k + \epsilon_k$$

Where y_k is the outcome of interest (i.e., log of light density in 2000) in district k. My main variable of interest, $\alpha(School_x)_k$, captures the distribution of a given school x (Protestant Missionary or Ottoman) in the Ottoman kaza k.[92] I use the number of schools per 1000 people in a given kaza as my main measure of school presence. In all specifications, α measures the long-term link between nineteenth-century schooling and current

[92] I also run models with "Armenian schools per capita" as my main explanatory variable. None of these models identified a significant relationship between schooling and development. This is to be expected given the removal of the Armenian population from Ottoman Turkey. Due to space restrictions, I do not include these models.

development outcomes. Population density, PD_{1893}, is included as a proxy for initial economic conditions. Controlling for historical population density is essential to make a meaningful comparison between changes in outcome measures across districts with different distribution of educational institutions. X_k denotes the set of exogenous geographic, climatic, transport, and politic factors that might influence regional economic development. Standard errors are clustered at the level of the Ottoman sanjak in 1893.

The results of Table 13 investigate the association between missionary presence and economic development in Turkey. A comparison across columns shows that none of the models identify a significant relationship between missionary schools and higher levels of income. This stands in contrast to the established consensus concerning Protestant education's legacies for economic development. Moreover, when I substitute schooling with station presence in Models 5 through 8, I find that a one unit increase in stations per capita decreases log luminosity by around 0.7 and 0.9 percent. Missionary stations were established in the Eastern Anatolia and most of their target population were either killed or displaced during various episodes of ethnic violence. Thus, without the intergenerational transmission of human capital or persistence of missionary education, missionary presence in Turkey either had no direct effect or a negative effect on economic development in Turkey.

Table 13: Missionary Presence and Nighttime Luminosity

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(log) Population Density (1893)	0.322**	0.179*	0.159*	0.132+	0.325**	0.179*	0.159*	0.130+
	(0.121)	(0.072)	(0.065)	(0.067)	(0.121)	(0.072)	(0.065)	(0.066)
Missionary Schools Per Capita	-0.065	-0.043	-0.039	-0.037				
	(0.085)	(0.038)	(0.033)	(0.033)				
Missionary Stations Per Capita					-0.008+	-0.010*	-0.008*	-0.008**
					(0.005)	(0.004)	(0.003)	(0.003)
Christian Share	1.113**	1.060***	0.901***	0.835**	1.100**	1.043***	0.891**	0.821**
	(0.405)	(0.281)	(0.256)	(0.244)	(0.409)	(0.284)	(0.258)	(0.247)
Average Elevation		-0.001***	-0.001***	-0.001***		-0.001***	-0.001***	-0.001***
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Average Precipitation		-0.000	-0.000	0.000		-0.000	-0.000	0.000
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
(log) Distance to Lake		-0.019*	-0.006	-0.005		-0.019+	-0.006	-0.005
		(0.010)	(0.009)	(0.009)		(0.010)	(0.009)	(0.010)
(log) Distance to River		0.002	-0.001	0.001		0.003	0.000	0.001
		(0.009)	(0.009)	(0.009)		(0.009)	(0.010)	(0.009)
(log) Distance to Port			-0.017	-0.009			-0.017	-0.009
			(0.017)	(0.018)			(0.017)	(0.018)
(log) Distance to Ottoman Trade Route			-0.041***	-0.037***			-0.041***	-0.036***
			(0.008)	(0.009)			(0.008)	(0.008)
(log) Distance to 19th Century Train			-0.026*	-0.022*			-0.026*	-0.022*
			(0.010)	(0.010)			(0.010)	(0.010)
19th Century Road Density			-1.112	-2.020			-0.989	-1.854
			(3.734)	(3.419)			(3.695)	(3.365)
(log) Distance to Capital				-0.018				-0.023
				(0.069)				(0.068)
Central Kaza Dummy				0.329***				0.332***

				(0.095)				(0.095)
Constant	0.205	1.564***	2.131***	2.245*	0.193	1.573***	2.131***	2.306*
	(0.341)	(0.296)	(0.410)	(0.962)	(0.344)	(0.293)	(0.409)	(0.948)
Observations	330	329	329	329	330	329	329	329
R-squared	0.210	0.482	0.528	0.541	0.208	0.483	0.528	0.542

Robust standard errors in parentheses
**** p<0.001, *** p<0.01, ** p<0.05, +p<0.1

Table 14 reports the results for the baseline OLS specification but focuses on Ottoman state-run male schools. The results indicate that while *ibtidâî* (primary) schools are not related to contemporary light density, *rüşdiyye* (upper primary) schools are. A one unit increase in the average distribution of male *rüşdiyye* schools increases the log luminosity by 23 percent in Model 8. The relationship between *rüşdiyye* schools and luminosity remains significant even after climactic, geographic, and historical controls are included in the models. These results suggest that early investment in primary education by the Ottoman had long-run consequences. This effect, however, seems to be limited to advanced levels of primary education.

Table 14: Male Ottoman Schools and Nighttime Luminosity

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(log) Population Density (1893)	0.183	0.107	0.082	0.079	0.206*	0.123*	0.106+	0.105+
	(0.123)	(0.070)	(0.064)	(0.061)	(0.103)	(0.060)	(0.058)	(0.059)
Male Ibtidai Schools per Capita	-0.031	0.017	0.020	0.013				
	(0.033)	(0.027)	(0.025)	(0.023)				
Male Rüşdiyye School Concentration					0.289***	0.168***	0.156***	0.214***
					(0.049)	(0.034)	(0.037)	(0.044)
Christian Share	1.485***	0.941**	0.867**	0.920**	0.997**	0.995***	0.858***	0.848***
	(0.359)	(0.311)	(0.285)	(0.299)	(0.342)	(0.238)	(0.228)	(0.234)
Average Elevation		-0.001***	-0.001***	-0.001***		-0.001***	-0.001***	-0.001***
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Average Precipitation		-0.000	0.000	0.000		-0.000	0.000	-0.000
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
(log) Distance to Lake		-0.010	0.005	0.002		-0.017+	-0.004	-0.007
		(0.012)	(0.011)	(0.011)		(0.010)	(0.009)	(0.009)
(log) Distance to River		-0.006	-0.011	-0.006		0.001	-0.001	0.003
		(0.009)	(0.010)	(0.010)		(0.009)	(0.009)	(0.009)
(log) Distance to Port			-0.009	0.003			-0.012	-0.007
			(0.018)	(0.019)			(0.016)	(0.017)
(log) Distance to Ottoman Trade Route			-0.042***	-0.034**			-0.041***	-0.034***
			(0.011)	(0.012)			(0.008)	(0.008)
(log) Distance to 19th Century Train			-0.023*	-0.029*			-0.022*	-0.027*
			(0.010)	(0.012)			(0.010)	(0.010)
19th Century Road Density			2.813	1.597			0.730	-1.121
			(3.631)	(3.759)			(3.267)	(3.300)
(log) Distance to Capital				0.144				0.115+
				(0.100)				(0.064)
Central Kaza Dummy				0.362**				0.339***

				(0.110)				(0.090)
Constant	0.649+	1.759***	2.155***	0.230	0.189	1.457***	1.917***	0.388
	(0.361)	(0.305)	(0.409)	(1.304)	(0.258)	(0.241)	(0.364)	(0.891)
Observations	253	253	253	253	330	329	329	329
R-squared	0.160	0.406	0.467	0.497	0.290	0.507	0.549	0.569

Robust standard errors in parentheses
**** p<0.001, *** p<0.01, ** p<0.05, + p<0.1

Table 15 reports the results for the baseline OLS specification for Ottoman state-run female schools. A comparison across columns shows that only Model 1 identified a significant relationship between ibtidâî concentration and log luminosity. In line with the patterns outlined with Ottoman male schools, this association changes when we consider female rüşdiyye schools. Female rüşdiyye schools are significantly and positively related to contemporary luminosity in all models. In agreement with the literature on gender inequality and economic growth, the results also indicate that investments in female education made greater contributions to present-day development. The size of coefficients for female rüşdiyye schools is nearly double that of male rüşdiyye schools—with a one-point rise in the average distribution of female rüşdiyye schools leading to an increase of 40 percent in contemporary log luminosity.

Table 15: Female Ottoman Schools and Nighttime Luminosity

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(log) Population Density (1893)	0.167	0.107	0.081	0.079	0.240*	0.130*	0.107+	0.107+
	(0.124)	(0.070)	(0.064)	(0.060)	(0.110)	(0.058)	(0.057)	(0.058)
Female Ibtidâî Schools per Capita	0.301**	0.039	0.013	0.007				
	(0.097)	(0.073)	(0.083)	(0.080)				
Female Rüşdiyye School Concentration					0.395***	0.266***	0.255***	0.340***
					(0.071)	(0.039)	(0.044)	(0.064)
Christian Share	1.272**	0.924**	0.869**	0.928**	0.909*	0.928***	0.812***	0.789**
	(0.364)	(0.315)	(0.295)	(0.301)	(0.376)	(0.238)	(0.231)	(0.240)
Average Elevation		-0.001***	-0.001***	-0.001***		-0.001***	-0.001***	-0.001***
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Average Precipitation		0.000	0.000	0.000		-0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
(log) Distance to Lake		-0.010	0.004	0.002		-0.016	-0.003	-0.006
		(0.012)	(0.011)	(0.011)		(0.010)	(0.009)	(0.009)
(log) Distance to River		-0.005	-0.010	-0.005		-0.001	-0.003	-0.000
		(0.009)	(0.010)	(0.009)		(0.009)	(0.009)	(0.009)
(log) Distance to Port			-0.010	0.003			-0.011	-0.005
			(0.018)	(0.019)			(0.016)	(0.017)
(log) Distance to Ottoman Trade Route			-0.042***	-0.033**			-0.039***	-0.033***
			(0.011)	(0.011)			(0.008)	(0.008)
(log) Distance to 19th Century Train			-0.023*	-0.030*			-0.023*	-0.028**
			(0.011)	(0.012)			(0.010)	(0.010)
19th Century Road Density			3.149	1.833			2.297	0.966
			(3.729)	(3.843)			(3.451)	(3.519)
(log) Distance to Capital				0.150				0.113+
				(0.102)				(0.064)
Central Kaza Dummy				0.361**				0.332***

				(0.111)				(0.090)
Constant	0.531	1.756***	2.169***	0.159	0.370	1.617***	2.019***	0.559
	(0.338)	(0.297)	(0.399)	(1.326)	(0.300)	(0.243)	(0.355)	(0.865)
Observations	253	253	253	253	330	329	329	329
R-squared	0.179	0.405	0.465	0.497	0.269	0.508	0.550	0.570

Robust standard errors in parentheses
**** p<0.001, *** p<0.01, ** p<0.05, + p<0.1

Educational Competition and Luminosity

In the following section, I use the dataset and Herfindahl-Hirschman indices described in Section 4 to test whether long-run development outcomes differ among districts that had educational competition. Based on the historical narrative provided in Section 3, I will consider the three significant relations of competition: 1) the competition between Protestant missionary and Armenian schools (i.e., Christian Competition), 2) competition between Protestant missionary and Ottoman state-run schools (i.e., Imperial Competition), and 3) competition between Protestant, Ottoman, and Armenian schools (i.e., Total Competition). My key independent variable is an educational competition index for each district calculated for all three sets of educational competition. The empirical model I estimate is as follows:

$$y_k = \alpha(CompetitionIndex_x)_k + \delta ln(PD_{1893})_k + \beta X_k + \epsilon_k$$

Basic statistics show that the estimated relationship of competitiveness between Protestant schools and native institutions and luminosity is significant and positive. In Models 1 through 3 in Table 16, the Christian Competition index is negatively related to luminosity. In other words, *ceteris paribus*, a move from a district that has a monopolistic education market to a district with a highly competitive Christian education market increases log luminosity around 25 percent. The coefficients for imperial and total competition indices are even higher. Models 4 through 6 run the same models but replace the Christian Competition index with imperial competition index. Results suggest a 45 to 54 percent increase in log luminosity moving from a monopolistic education market to a more competitive one. Models 10 through 12 include the total competition index, and reaffirm the role competition has played in contemporary development, reporting a 50 to 54 percent

increase in log luminosity for a similar growth in rivalry. This implies that the most notable competitive relationship was the one that included the Ottoman state, highlighting the importance to consider indigenous state actors in non-colonial settings.

Table 16: Competition Indices and Nighttime Luminosity

VARIABLES	(1) Christian	(2) Christian	(3) Christian	(4) Imperial	(5) Imperial	(6) Imperial	(7) Total	(8) Total	(9) Total
(log) Population Density (1893)	0.168*	0.147*	0.119+	0.189*	0.164*	0.133+	0.174*	0.146*	0.110+
	(0.071)	(0.064)	(0.065)	(0.079)	(0.071)	(0.073)	(0.070)	(0.062)	(0.060)
Christian Competition Index	-0.541*	-0.489*	-0.411+						
	(0.223)	(0.203)	(0.213)						
Imperial Competition Index				-0.722*	-0.686*	-0.645*			
				(0.285)	(0.276)	(0.289)			
Total Competition Index							-0.687**	-0.770***	-0.718**
							(0.210)	(0.199)	(0.217)
Christian Share	1.007***	0.863**	0.801**	0.856**	0.729**	0.669**	0.786*	0.706*	0.630*
	(0.279)	(0.252)	(0.239)	(0.268)	(0.241)	(0.228)	(0.300)	(0.272)	(0.258)
Average Elevation	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Average Precipitation	-0.000	0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
(log) Distance to Lake	-0.017	-0.004	-0.003	-0.016	-0.004	-0.003	-0.011	0.002	0.004
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)	(0.012)	(0.012)
(log) Distance to River	0.005	0.001	0.002	0.008	0.004	0.005	0.006	0.002	0.002
	(0.009)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
(log) Distance to Port		-0.016	-0.009		-0.016	-0.009		-0.007	0.001
		(0.016)	(0.018)		(0.017)	(0.018)		(0.018)	(0.020)
(log) Distance to Ottoman Trade Route		-0.040***	-0.035***		-0.038***	-0.034***		-0.040***	-0.035**
		(0.008)	(0.008)		(0.008)	(0.009)		(0.011)	(0.011)
(log) Distance to 19th Century Train		-0.029**	-0.023*		-0.031**	-0.026*		-0.032**	-0.024*
		(0.010)	(0.010)		(0.010)	(0.010)		(0.009)	(0.010)
19th Century Road Density		-0.989	-1.680		-0.756	-1.416		0.966	0.440
		(3.627)	(3.324)		(3.662)	(3.312)		(3.886)	(3.390)
(log) Distance to Capital			-0.030			-0.034			-0.048

			(0.065)			(0.066)			(0.063)
Central Kaza Dummy			0.305**			0.307**			0.296**
			(0.098)			(0.097)			(0.110)
Constant	2.072***	2.588***	2.781**	2.168***	2.705***	2.987**	2.161***	2.635***	3.082**
	(0.385)	(0.420)	(0.908)	(0.347)	(0.440)	(0.994)	(0.332)	(0.412)	(0.919)
Observations	329	329	329	329	329	329	272	272	272
R-squared	0.488	0.532	0.544	0.493	0.537	0.549	0.492	0.547	0.560

Robust standard errors in parentheses
**** p<0.001, *** p<0.01, ** p<0.05, + p<0.1

Robustness Checks

My results show that historical educational competition played a crucial role in shaping regional development patterns in the Ottoman Turkey. In light of the literature on Ottoman education, I interpret my findings as evidence of a human capital legacy of educational competition. Competition increased both the number and quality of schools which in turn led to higher levels of human capital and thus economic growth. I argue that competition influenced educational expansion through both supply and demand channels. In what can be considered supply-side influences, educational competition between Armenian and Protestants drove pedagogical innovations and expansion of schooling to broader segments of the Christian population. These changes were not restricted to Christian communities, however. The Ottoman state felt threatened by the growing educational and economic disparity between its Muslim and Christian subjects. The educational competition of the nineteenth century thus generated a reflex effect by spurring the Ottoman state to reform its educational system and increase the number of schools in the provinces.

Rivalry between different schools also triggered changes in the demand for education. Armenians and Muslims living in the provinces petitioned the capital to invest in more in education as a way to counterbalance the influence of Protestant missionaries (Derderian 2019: chapter 3). These efforts did not go unnoticed by missionaries as they frequently boasted that education was becoming better valued as a result of their efforts (Barnum 1890). I claim that such changes had positive human capital spillovers for the local Muslim populations. Through this reflex dynamic, the inertia created had a lasting impact on local development, despite the fact that the Christian populations in question have ceased to exist in these geographies.

Emulation and greater demand for education by local populations are two important mechanisms explaining the link between competition and development. Yet, there is another channel that needs to be considered. Following the ethnic violence that displaced much of the Armenian population, many of the abandoned properties of Armenians were usurped by the State, to be used as schools, prisons, police stations or hospitals. In the realm of education, the abandoned properties of Armenians were used to compensate for the inadequacies in the educational supply of Muslim schooling. Thus, a large number of the Armenian schools built to counter Protestant missionary efforts were in effect turned into government schools. In this way, competition also equipped the Ottoman and Turkish state with additional resources connected to schooling.

To test whether educational competition impacted contemporary economic development through the above specified mechanisms, we need to examine whether its influence can be observed in the short—and long-term. In this section, I use the precise nature of my geocoded data to account for fixed effects. I also perform a multitude of robustness analyses to demonstrate that regions with competitive educational environments in the nineteenth century have higher human capital as proxied by student enrolment, schooling, and literacy. The following section will examine these figures at distinct junctures in the late Ottoman and Republican Turkey.

Village-Level Data

My district-level analysis in the preceding section makes a strong case for the positive and causal legacy of educational competition in Ottoman Turkey. Higher levels of Christian, Imperial and Total Competition explain a substantial variation in current levels of subnational development in contemporary Turkey. I find this result is robust to a rich set of controls. Furthermore, I present archival evidence reveals that missionary labours in urban centres bore little fruit. Nonetheless, my district-level robustness checks cannot entirely rule out an endogeneity problem. In this section, following the example of Arbatli and Gokmen (2018), I use random points, instead of districts, as my unit of analysis. Specifically, I exploit *within-district* variations in the proximity to both Protestant missionary stations and Gregorian Armenians Schools across these points instead of *within-subprovince* variations in the competition indices across districts.

In doing so, I am able to evaluate the legacy of historical educational competition patterns on current economic activity at a highly localized level. Since in such a fragmented analysis, I am able to account for district-level fixed effects, I can also rule out the potential bias due to selection of educational institutions across district boundaries within a subprovince. Many of the latent variables that could independently shape both the historical distribution of economic activity as well as the variation in education competition within a subprovince or province become plausibly less relevant when I focus my attention onto variations across points within a district.

I employ the geocoded locations of Protestant missions and Armenian schools as my measurements of schooling presence. Given that I do not know the exact locations of Ottoman ibtidâî or rüşdiyye schools, I exclude them from my analysis in this section. Using the geocoded locations of Christian schooling, I am able to isolate places where Armenian

and Protestant existed within a 5 km radius of one another. This interaction serves as my measurement of Christian educational competition. I regress luminosity on the presence of educational institutions in the close vicinity of 25,708 random points[93] conditional on a large set of potential confounders. My estimating equation is a follows:

$$(AvgLum5km)_i = \eta + \alpha(Competition5km)_i + \theta' X_i + \delta_i + \varepsilon_i$$

Where i is the locality, either urban or rural. $(AvgLum5km)_i$ is the log of mean luminosity in year 2000 with 5 km radius of i. $(ChristianCompetition5km)_i$ is a binary variable indicating the presence of both an Armenian school and Protestant missionary station within 5 km radius of the district "i". X_i is a vector of geographic attributes as well as historical and contemporary correlates of development. Geographic attributes consists of longitude, latitude, elevation, distances to the nearest major river, lake. Commercial correlates include an indicator for locations within 15 km to an Ottoman urban centre (circa 1900)[94] and distances to historical trade routes. Contemporary controls are an indicator of locality types (city, hamlet, isolated dwellings, town or village), distance to modern railroad network, distance to nearest province centre, and distance to each of the four biggest commercial/industrial centres (Istanbul, Izmir, Ankara, Bursa).

The detailed nature of the data allows me to account for province or district fixed effects denoted by δ_i, thereby, evaluating educational competition legacy using only the variations across points within a given administrative unit. A major advantage of including fixed effects at such a local level is that reduces the likelihood of selection bias by eliminating

[93] I started with a random sample of 47,933 points in Turkey with at a minimum distance of 1 km between them. Some of the districts from the Ottoman-era were split between Turkey and its neighboring states. I exclude the points that fall outside the borders of modern Turkey. Similar to the previous section, I also exclude the Sanjak of Kars from my analysis. Following this my random sample size was reduced to 25,708 locations.

[94] The sample of Ottoman cities comes from Yunus Uğur's (2018) work on Ottoman cities. See the Variable Definitions section in the Data Appendix for a list of the sample of cities included in the analysis.

large portions of variation thought to contain confounding factors. I effectively compare the locations that are not only geographically and culturally very close but also governed by the same subnational administrative body. Therefore, such locations are very unlikely to vary with respect to omitted factors that may confound the causal relationship between presence of competition and luminosity.

Table 17 summarizes my results. Models 1 through 3 use the entire sample, compiling urban and rural points together, while Models 3 through 6 uses rural locations only. I start in Model 1 by introducing my variable of interest together with a dummy variable for location type. The next two columns introduce geographic, climatic, economic and political controls. Controlling for these variables reduces the coefficients of interest. Adding province fixed effects, in Model 3, further decreases the effect of Christian Competition, but does not affect its significance. Model 3 suggests a location with both a Protestant mission and Armenian school within a 5 km radius is 104 percent more lit up than other comparable location in the same district.

One might be concerned that my results are driven by relatively more urbanized locations rather than rural areas. It is likely that Christian Competition was prevalent in historically more urban centres and towns. To address this issue, in Models 4 through 6, I estimate my models on the sample of villages only. The results are significant and very similar to the findings in the previous models. This suggests that the persistence of Christian Competition on local development is not merely an urban phenomenon. Even though the mass expulsions and closure of missionary schools dealt a serious blow to the viability of selected locations, competitive environments—i.e., places that had both a Protestant and Armenian school—are significantly more prosperous today.

Table 17: Educational Competition and Luminosity at the Village-Level

	Full Sample			Villages Only		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Competition	0.991***	0.848***	0.715***	0.892***	0.784***	0.681***
	(0.103)	(0.082)	(0.063)	(0.102)	(0.082)	(0.065)
Village Dummy	-0.116	-0.276***	-0.264***			
	(0.079)	(0.077)	(0.049)			
Distance to Lakes		-0.000	0.000		-0.000	0.000+
		(0.000)	(0.000)		(0.000)	(0.000)
Latitude		0.013	-0.025		0.002	-0.042
		(0.029)	(0.073)		(0.027)	(0.070)
Longitude		0.035***	0.023		0.042***	0.035
		(0.009)	(0.095)		(0.008)	(0.080)
Average Elevation		-0.001***	-0.001***		-0.001***	-0.001***
		(0.000)	(0.000)		(0.000)	(0.000)
Average Precipitation		0.000	-0.000*		0.000	-0.000*
		(0.000)	(0.000)		(0.000)	(0.000)
Distance to Ports			-0.000+			-0.000*
			(0.000)			(0.000)
Distance to Roads			-0.000			-0.000
			(0.000)			(0.000)
Distance to Train			0.000*			0.000*
			(0.000)			(0.000)
Distance to Commercial Centers			-0.000			-0.000
			(0.000)			(0.000)
Province Capital			-0.000***			-0.000***
			(0.000)			(0.000)
Constant	0.790***	0.210	3.155	0.682***	0.131	3.188
	(0.108)	(1.147)	(3.453)	(0.053)	(1.099)	(3.208)

Observations	25,708	25,708	25,708	22,297	22,297	22,297
R-squared	0.049	0.245	0.237	0.039	0.226	0.220
Number of Provinces			80			80

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Competition and Human Capital Indicators

Ottoman Enrolment & Schooling Figures (1914)

The first reliable and detailed statistics on schooling rates[95] in the Ottoman Empire comes from the 1914–1915 Educational Yearbooks. These statistical reports contain information on the number of people who have reached the compulsory schooling age, alongside figures on the number of students enrolled at ibtidâî schools, all down to the kaza level.[96] Based on these two variables it is possible to calculate schooling rates for the period in question. Limiting my focus to kazas that had at least one Christian institution, I perform a reduced OLS analysis in Table 18 – with control variables limited to physical access – to investigate the relationship between Muslim enrolment and Christian Competition.[97] Basic statistics show that a move from a highly competitive educational market (HHI score: 0.5) to a purely monopolistic educational market (HHI score: 1) decreases the average Muslim enrolment in that kaza by around 4.7 percent.[98] Furthermore, when I substitute the dependent variable with the female-male ratio of enrolled students, I find the Christian share of the population, missionary station and school presence are all positively and significantly related to the gender parity index (GPI) at ibtidâî schools. This shows that districts with a greater concentration of missionaries and a large indigenous Christian population perform better on the GPI – supporting the view that Ottoman education was modernized and

[95] Schooling rate is defined as the relationship between the actual number of students and the population of that age group.
[96] The data is incomplete for some *kazas*. Only 253/332 of the *kazas* contain some information on the number of eligible students and the number of actual students.
[97] I exclude Total and Imperial Competition indices from my analysis because their calculation uses total ibtidâî school numbers, which is correlated with total enrolment figures.
[98] When I include Christian share of the population as a control variable, both Christian share and Christian Competition lose their significance. Christian share on its own is significant; one unit increase in the population that is Christian corresponds to 21 percent increase in total enrolment at ibtidâî schools in 1914.

expanded as a reaction to missionary threat. It also shows that presences of a large indigenous Christian population had a positive influence on the advancement of Muslim female schooling, demonstrating the importance of "peer group effects" or "neighbourhood effects" in Ottoman Turkey. I also examine the determinants of female rüşdiyye school concentration since these upper-primary schools were singled out as the main human capital channel for long-run development. The results from this analysis corroborate my earlier findings and show that Christian Competition, Total Competition and Missionary School presence are statistically significant and correlated with female rüşdiyye school concentration; with each additional unit increase representing 2 to 4.5 percent increase in rüşdiyye school concentration.

Table 18: Missionary Presence, Competition and Education in the Late Ottoman Period

VARIABLES	(1) Ibtidâî Enrolment	(2) Ibtidâî GPI	(3) Ibtidâî GPI	(4) Ibtidâî GPI	(6) Rüşdiyye	(8) Rüşdiyye	(9) Rüşdiyye
(log) Population Density (1893)	1.941*	-0.025	-0.026	-0.033+	0.028	0.035	0.029
	(0.962)	(0.016)	(0.016)	(0.017)	(0.035)	(0.038)	(0.038)
Christian Share		0.375***	0.367***	0.206**	0.285	0.342	-0.042
		(0.062)	(0.065)	(0.075)	(0.437)	(0.437)	(0.376)
Missionary Stations Per Capita		0.006***					
		(0.001)					
Missionary Schools Per Capita			0.033**				
			(0.010)				
Missionary School Presence					0.205***		
					(0.058)		
Christian Competition Index	-9.317+			-0.107		-0.178+	
	(5.243)			(0.066)		(0.103)	
Total Competition Index							-0.381*
							(0.188)
Average Elevation	0.001	-0.000***	-0.000***	-0.000***	0.000	0.000	-0.000
	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
(log) Distance to River	0.012	0.000	0.001	-0.003	0.008	0.007	0.007
	(0.274)	(0.002)	(0.002)	(0.003)	(0.010)	(0.010)	(0.012)
(log) Distance to Port	-0.392	-0.004	-0.004	-0.006	-0.012	-0.010	-0.011
	(0.493)	(0.006)	(0.006)	(0.006)	(0.016)	(0.016)	(0.017)
(log) Distance to Train	-0.835+	-0.006**	-0.006**	-0.009***	0.020*	0.022*	0.022*
	(0.494)	(0.002)	(0.002)	(0.002)	(0.009)	(0.009)	(0.009)
(log) Distance to Capital	-4.920	-0.032*	-0.036*	-0.028+	-0.435***	-0.437***	-0.430***
	(3.363)	(0.013)	(0.015)	(0.016)	(0.110)	(0.114)	(0.108)
Central Kaza Dummy	4.135	0.033	0.030	0.039	-0.079	-0.049	-0.026
	(3.183)	(0.024)	(0.023)	(0.034)	(0.064)	(0.057)	(0.055)
Constant	95.978*	0.832***	0.876***	0.986**	5.442***	5.588***	5.815***

	(41.619)	(0.200)	(0.218)	(0.293)	(1.286)	(1.275)	(1.372)
Observations	156	251	251	147	316	316	257
R-squared	0.260	0.478	0.464	0.396	0.477	0.471	0.468

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Schooling rates can include both supply and demand dynamics. Higher enrolment figures can reflect both a greater number of schools and a greater demand for education, both of which can increase the number of students in enrolled in a school. One way to isolate the influence of Christian Competition on the supply side is to look at the expansion of school networks during this period. The 1913-1914 Educational statistics provide the number of ibtidâî schools built before and after 1908 for each vilayet (province), which provides a unique glimpse into the extent of government investment in education during this period. Early twentieth century is when missionary activity reached its height, so we should expect the number of schools built after 1908 to be higher than those built before 1908 in above average competition provinces. Overall, I find that provinces with above median competition have built 3.7 times more ibtidâî schools after 1908 than they did prior to 1908. Whereas, below provinces with below median competition built only 1.77 times more schools.

Literacy in the Early Republican Period

The first census of the Turkish Republic was conducted in 1927. According to this census, the total population of Turkey was 13.6 million, 97.4 percent of those counted registered as Muslim, and the overall literacy rate was reported as 10.58 percent.[99] Whilst these figures are an important source of data for early schooling figures in the Turkish Republic, their use can also be problematic for two main reasons. Firstly, these figures predate the change to a Latin script and are based on the ability to comprehend the Arabic alphabet, and secondly, a significant proportion of the young population educated during the Hamidian period died in battlefronts due to a protracted period of wars (Balkan Wars, WWI, and Greek-Turkish Wars).[100] A more reliable source to investigate the legacy of early educational investment is the second Turkish Republican Census of 1935. According to this census, the literacy rate of the total population was around 19.25 percent. Using provincial averages of literacy reported in the Census of 1935, I find that the average difference in literacy between high and low competition provinces is around 1 percent. When I break down this finding further, I discover that this contrast is driven by gender variations in literacy, as high competition provinces have an average female literacy of 7.1 percent, whereas for low competition provinces this figure is 5.8 (see Figure A.8 in the Appendix). As a final check, I examine enrolment in primary schools in 1935 and find that a one unit increase in female missionary schools per Capita corresponds to a 3 percent increase in the gender parity in Turkish public primary schools (see Table A.4 in the Appendix). This shows

[99] 17.42 percent for men and 4.68 percent for women.
[100] When I ran an OLS analysis with a merged 1927 Census that included all environmental and historic controls I found that a move from a monopolistic Christian educational market to a higher competitive one increased overall literacy by 0.7 percent.

that the legacy of Protestant investments in women's education persisted even after the closure of missionary schools and removal of Christian population.[101]

[101] The unconditional correlation between GPI for ibtidâî schools in 1914 and GPI for Turkish primary schools in 1937 is 44.2 percent (see Figure A.9 in the Appendix). Spearman rank coefficient is 65.8 and a test rejects the null hypothesis that both variables are independent.

Discussion

Through an original study based on a new dataset, this paper finds that late Ottoman era Protestant missionary activity had mixed effects on the social fabric of the Ottoman Turkey. Protestant missionaries pioneered modern schooling by introducing new types of educational technologies and institutions into the Ottoman Empire. Over time, in what could be regarded as reflex or indirect effects, missionary efforts led to the broadening of educational provision by progressive Gregorian Armenians and Ottoman bureaucrats, leading to its greater social acceptability and demand. These actors' combined efforts led to the institutionalization of women's education and facilitated the building of indigenous Muslim and Armenian schools outside major metropolises. I find, in turn, that such early investments in gender parity and human capital had positive long-run consequences for economic development in Turkey.

Previous studies have found that missionary presence correlates with positive contemporary development measures without clarifying the actual mechanism through which missionary investments is likely to persist. While some scholars have focused on investments in infrastructure and intergenerational transmission of human capital, others have begun to recognize that emulation and competition might be an important and neglected channel. This study set out to separate these mechanisms and determine how the local Muslim population responded to the expansion of missionary activities. Turkey is a unique case to do so because the two direct channels, investments in schooling infrastructure and intergenerational transmission of human capital, are inhibited. Using an original GIS dataset, I find no evidence of a missionary legacy on economic development in Turkey. That being said, I was able to confirm the role that indirect effects or emulation has played in Ottoman Turkey by showing that places with historically heightened competition between missionary

schools and native educational institutions are more likely to have higher income, as measured by night-time light density.

The study also examines mechanisms through which educational competition may have affected long-term development. Results suggest that rivalry between different educational actors were associated with better quality and access to education. Competitive districts in the late Ottoman period have higher overall ibtidâî enrolment and superior gender parity scores. The Ottoman State also invested heavily in competitive provinces, as school-building efforts were twice as high in these districts during the Hamedian period. This finding parallels the literature on Ottoman education which highlights the relative deprivation between Muslim and non-Muslim subjects of the Empire as a key explanatory factor in the expansion of an empire-wide public schooling (e.g., Deringil 1998). The historical presence of competition is also associated with higher quality of educational during the Republican period. The first two Turkish censuses show that competitive districts report better female literacy rates and better gender parity figures. A large literature claims that gender equality can be beneficial for economic development. The findings in this paper confirm this link over the long-term, showing that competition – working through gender parity – had positive human capital spillovers for the Muslim population and is a significant factor explaining subnational variations in economic development. The results may help inform our understanding of gender parity as a mechanism through which missionary orders may shape long-term effects. They also indicate that emulation or reflex dynamics may shape long-term development.

My empirical study, while drawing on the literature missionaries, gender and development, also has implications for theory, as it helps specify the mechanisms of strategic adaptation of missionary groups to a non-colonial context where the dominant religion is different from their own. Colonized regions commonly limited the operation of indigenous

schooling and relied primarily on European missionaries to educate native populations. In contrast, in non-colonized regions, the state was an active participant in the educational market and had to adapt to missionary incursions. The Ottoman Empire serves as a crucial case for missionary studies given its non-colonial status, long-standing history of statehood, and well-organized native Christian population. Both the Ottoman state and Gregorian Armenians felt threatened by Protestant missionaries and, as a result, were incentivized to increase the number of their own schools and improve the quality of their educational systems. Failure to do so meant losing adherents to their faith or placing them under the pernicious influence of American Protestant missionaries. Future studies of missionary orders might benefit from recognizing the importance of rivalry with indigenous actors, especially in places with long-standing histories of statehood and absence of colonialism.

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Appendix

Variable Definitions

Population Density: Natural logarithm of district population per square kilometer. It is computed using Ottoman and Turkish Censuses and the surface area of each district. The 1893 Ottoman Census is the first census to record men and women according to their millet (religious and ethnic affiliation). Figures are reported for each Ottoman kaza (district). Ottoman kaza (district) borders were manually drawn using ArcGIS. Surface area is calculated using these geocoded polygons. Missing information is filled using provincial yearbooks from the same period. The 1893 Ottoman Census has been transcribed into Latin characters by Karpat (1985). Modern Turkish Census results can be accessed through TurkStat's web application.

Number of Missionary Stations: Total number of Protestant missionary stations in a given kaza. The station data is sourced from primary source material from the Archives of the American Board of Commissioners for Foreign Missions (ABCFM) at Houghton Library, Harvard University. Annual station reports, journals, and letters are consulted to find the exact location of missionary stations.

Number of Missionary Schools: Total number of male and female Protestant missionary schools in a given kaza. The schooling data is sourced from Alan (2015). Figures for number of schools per kaza are calculated through spatial computations in ArcGIS.

Average Elevation: The average elevation of a given district. The primary source is the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Global Digital Elevation Model Version 3 (GDEM 003). The dataset is jointly created by the Ministry of Economy, Trade, and Industry (METI) of Japan and the United States National Aeronautics and Space Administration (NASA). The ASTER GDEM's coverage spans from 83 degrees north latitude to 83 degrees south, encompassing 99 percent of Earth's landmass, with 30-meter posting and 1x1 degree tiles. The raster image for elevation is used to calculate average figures for each kaza using ArcGIS software.

Annual Mean Temperature: The average annual temperature of a given district. The primary source is the CHELSA (Climatologies at High Resolution for the Earth's Surface Areas) dataset. The CHELSA dataset includes monthly mean temperature and precipitation patterns for the time period 1979-2013. The raster image for regional temperature is used to calculate average figures for each kaza using ArcGIS software.

Annual Mean Precipitation: The average annual precipitation of a given district. The primary source is the CHELSA (Climatologies at High Resolution for the Earth's Surface Areas) dataset. The CHELSA dataset includes monthly mean temperature and precipitation patterns for the time period 1979-2013. The raster image for regional precipitation is used to calculate average figures for each kaza using ArcGIS software.

Distance to Nearest Lake: The logarithm of the minimum distance from the centroid of a district (in kilometres) to the nearest major lake. The shape file is downloaded from HydroLakes database (http://wp.geog.mcgill.ca/hydrolab/hydrolakes/) in vector format. The primary source is the HydroLakes database. The spatial computations are made using ArcGIS software.

Distance to Nearest River: The logarithm of the minimum distance from the centroid of a district (in kilometres) to the nearest major river. The shape file is downloaded from HydroLakes database (https://hydrosheds.org/page/hydrorivers) in vector format. The spatial computations are made using ArcGIS software.

Distance to Nearest Major Port: The logarithm of distance of a district (in meters) to the nearest major port. The spatial computations are made using ArcGIS software. The source of this data comes from the 1899 R. Huber Map. The major ports are Constantinople (Istanbul), Dardanelles (Çanakkale), Gallipoli (Gelibolu), Smyrna (Izmir), Silifke, Mersin, Alexandrette (Iskenderun), Erekli (Karadeniz Ereğli), Inebolu, Sinop, Samsun, Ordu, Dunie, Kiressoun (Giresun), Tireboli, Trebizonde (Trabzon), and Rize.

Distance to Ottoman Trade Routes: The logarithm of distance of a district (in kilometers) to the nearest Ottoman Trade route. The spatial computations are made using ArcGIS software. The source of this data is the Old World Trade Routes (OWTRAD) Project (http://www.ciolek.com/owtrad.html).

Distance to Carriageway: The logarithm of distance of a district (in kilometres) to the nearest nineteenth-century carriageway (chaussées). The spatial computations are made using ArcGIS software. The source of the data is Huber's Ottoman Map of 1899. Roads are manually traced using ArcGIS software.

Carriageway Density: The magnitude-per-unit area of nineteenth-century century carriageways that fall within given kaza. The spatial computations are made using the line density tool in ArcGIS software. The source of the data is Huber's Ottoman Map of 1899. Roads are manually traced using ArcGIS software.

Distance to the Capital Istanbul (Constantinople): The logarithm of distance of a district (in kilometers) to Istanbul (Constantinople) which was the capital of the Ottoman Empire (1299-1922). The spatial computations are made using ArcGIS software.

Central Kaza Dummy: Indicates whether the kaza in question was the administrative capital of a sanjak (sub-division) according to the 1893 Ottoman Census. The primary source I consulted for this information was the historical gazetteer of the Ottoman Empire compiled by Tahir Sezen (2017).

Ibtidâî Enrolment Figures (1914): The primary source for these figures are the Statistical Review of the Ministry of Education (Maarif-i Umumiyye Ihsaiyat Mecmuasi) for the Muslim calendar year of 1336. This report enumerates the number of schools, teachers, students, and those who have reached a compulsory schooling age. Using this information, it is possible to calculate relatively accurate enrolment rates for the period in question.

Ibtidâî Gender Parity Index (1914): The ratio of the absolute number female students to male students for the Ibtidâî schools for the school year starting in 1914. The primary source for these figures are the Statistical Review of the Ministry of Education (Maarif-i Umumiyye Ihsaiyat Mecmuasi) for the Muslim calendar year of 1336.

Gender Parity in Literacy (1927): The ratio of the absolute number of literature females to literate males. The literacy figures are an indication of competency over the Arabic alphabet. The primary source for these figures is the 1927 Census available on the Turkish Statistical Institute's (TÜİK) website.

Primary School Gender Parity Index (1937): The ratio of the absolute number female students to male students for public primary schools for the school year starting in 1937. The primary source for these figures are Educational Yearbooks for 1937–1938.

Supplementary Tables and Figures

Table A.3: Additional Sources Used for Ottoman Population Figures

Name of Kaza	Name of Sanjak	Name of Vilayet	Source
Ahlat Kaza	Bitlis Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Bitlis Kaza	Bitlis Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Hizan Kaza	Bitlis Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Mutki Kaza	Bitlis Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Capakcur	Genc Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Genc Kaza	Genc Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Kulp Kaza	Genc Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Bulanik Kaza	Mus Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Malazgirt Kaza	Mus Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Mus Kaza	Mus Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Sason Kaza	Mus Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Varto Kaza	Mus Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Eruh Kaza	Siirt Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Garzan Kaza	Siirt Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Pervari Kaza	Siirt Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Siirt Kaza	Siirt Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Sirvan Kaza	Siirt Sanjak	Bitlis Vilayet	1892 (1310 H.) Salname
Carsancak Kaza	Dersim Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Cemisgezek Kaza	Dersim Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Hozat Kaza	Dersim Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Kizilkilise	Dersim Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Mazgirt Kaza	Dersim Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Ovacik Kaza	Dersim Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Arabkir Kaza	Elaziz Sanjak	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Egin Kaza	Elaziz Sanjak	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Elaziz Merkez Kaza	Elaziz Sanjak	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Keban Madeni Kaza	Elaziz Sanjak	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Adıyaman (Hisn-i Mansur) Kaza	Malatya Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname

Akcadag Kaza	Malatya Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Behisni Kaza	Malatya Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Kahta Kaza	Malatya Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Malatya Merkez Kaza	Malatya Kaza	Elâziz (Elazığ) Vilayet	1893 (1311 H.) Salname
Pülümür (Kuzican) Kaza	Erzincan Sanjak	Erzurum Vilayet	1871 (1288 H.) Salname
Antakya Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Antep Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Bâb Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Belen Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Cebel-i Sem'ân Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Cisr-i Şuğûr Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Halep Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Harim Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Idlib Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Iskenderun Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Kilis Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Mare Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Münbiç Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Rakka Kaza	Halep Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Andirin Kaza	Maraş Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Elbistan Kaza	Maraş Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Maraş Kaza	Maraş Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Pazarcik Kaza	Maraş Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Zeytun Kaza	Maraş Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Birecik Kaza	Urfa Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Harran Kaza	Urfa Sanjak	Halep Vilayet	1900 (1318 H.) Salname
Rumkale Kaza	Urfa Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Suruc Kaza	Urfa Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Urfa Kaza	Urfa Sanjak	Halep Vilayet	1892 (1310 H.) Salname
Albak Kaza	Hakkâri Sanjak	Van Vilayet	1897 (1315 H.) Salname
Beytussebap	Hakkâri Sanjak	Van Vilayet	1897 (1315 H.) Salname
Çölemerik	Hakkâri Sanjak	Van Vilayet	1897 (1315 H.) Salname
Gevar Kaza	Hakkâri Sanjak	Van Vilayet	1897 (1315 H.) Salname
Hamidiye (Van) Kaza	Hakkâri Sanjak	Van Vilayet	1897 (1315 H.) Salname
Semdinyan Kaza	Hakkâri Sanjak	Van Vilayet	1897 (1315 H.) Salname

Table A.4: Gender Parity in Turkish Republican Primary Schools (1935)

VARIABLES	
(log) Population Density (1893)	-0.001
	(0.010)
Christian Share	0.198**
	(0.061)
Female Missionary Schools Per Capita	0.021**
	(0.008)
Average Elevation	-0.000*
	(0.000)
Average Precipitation	-0.000*
	(0.000)
(log) Distance to Lake	0.003
	(0.003)
(log) Distance to River	0.004*
	(0.002)
(log) Distance to Port	-0.002
	(0.005)
(log) Distance to Ottoman Trade Route	-0.002
	(0.002)
(log) Distance to 19th c. Railway	-0.004+
	(0.002)
(log) Distance to Capital	-0.077***
	(0.017)
Central Kaza Dummy	0.062**
	(0.022)
Constant	1.558***
	(0.243)
Observations	316
R-squared	0.521

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Figure A.3: Ottoman Kazas According to the 1893 Census

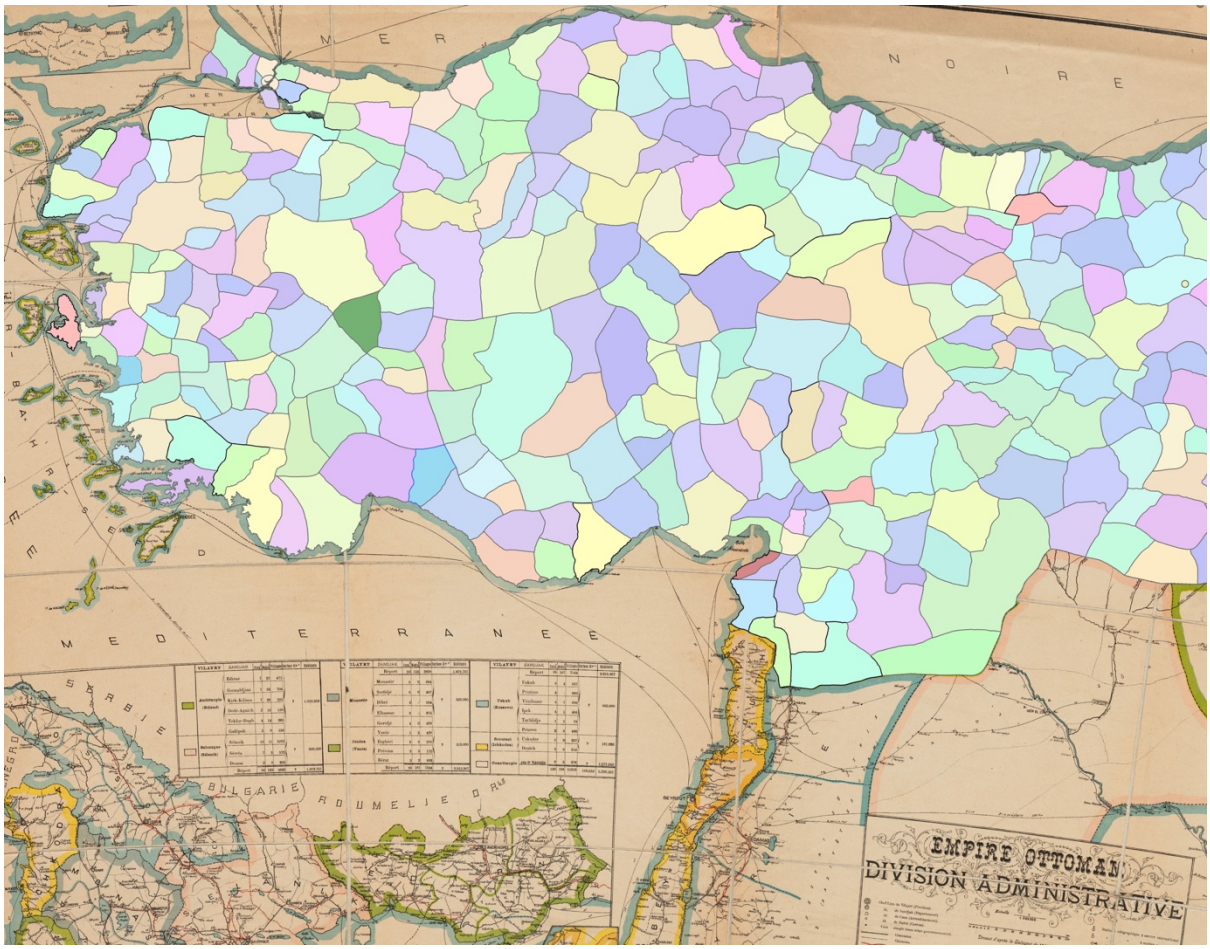


Figure A.4: Subnational Distribution of Christian Competition Scale

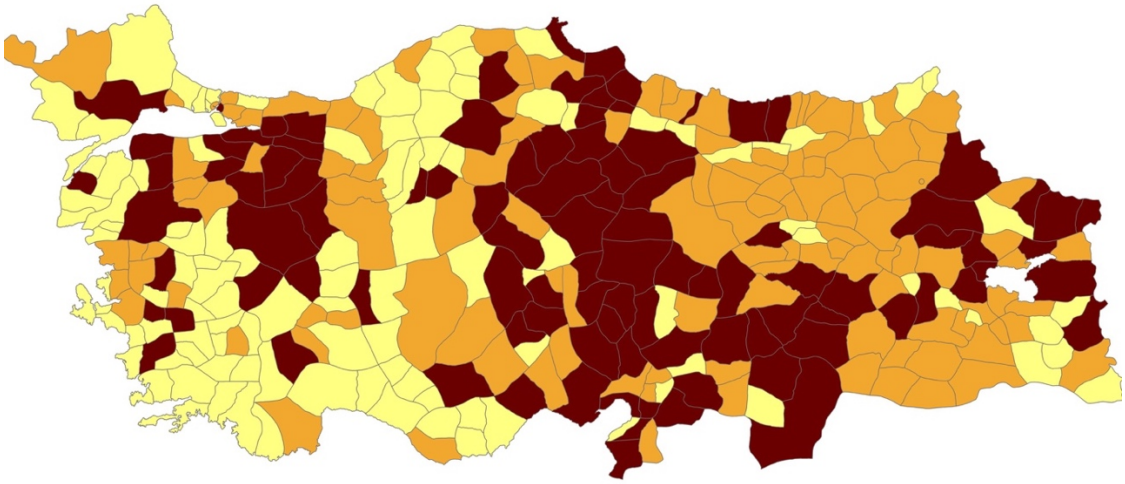


Figure A.5: Luminosity in Turkey

Figure A.6: The Relationship between District Income and Luminosity

Figure A.7: The Distribution of the Establishment of Missionary Stations

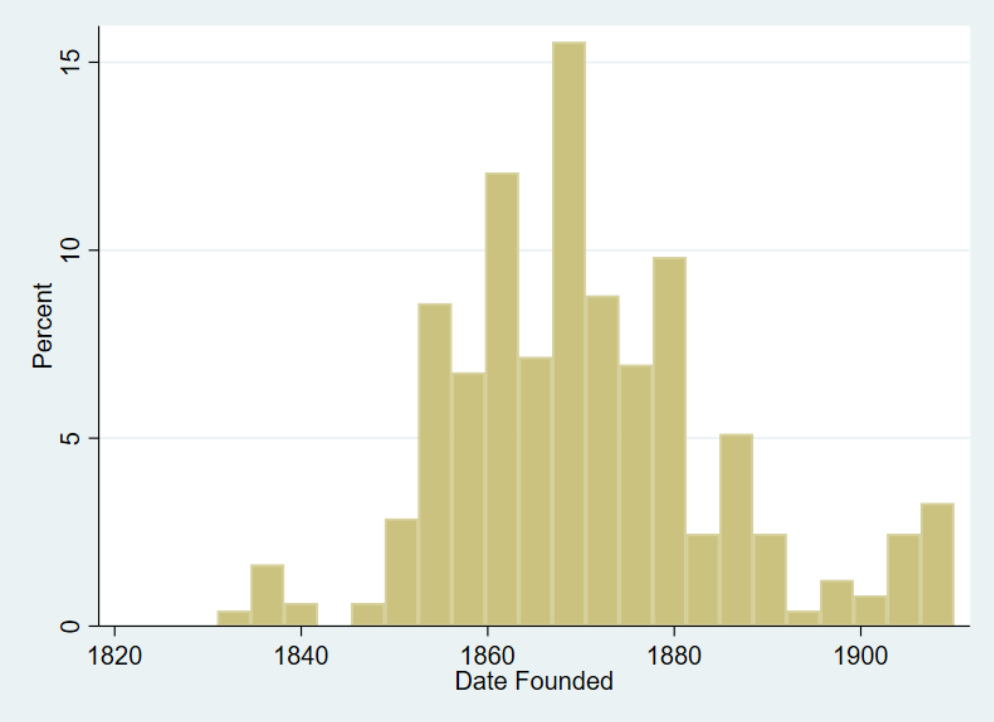


Figure A.8: Competition and Provincial Literacy Averages

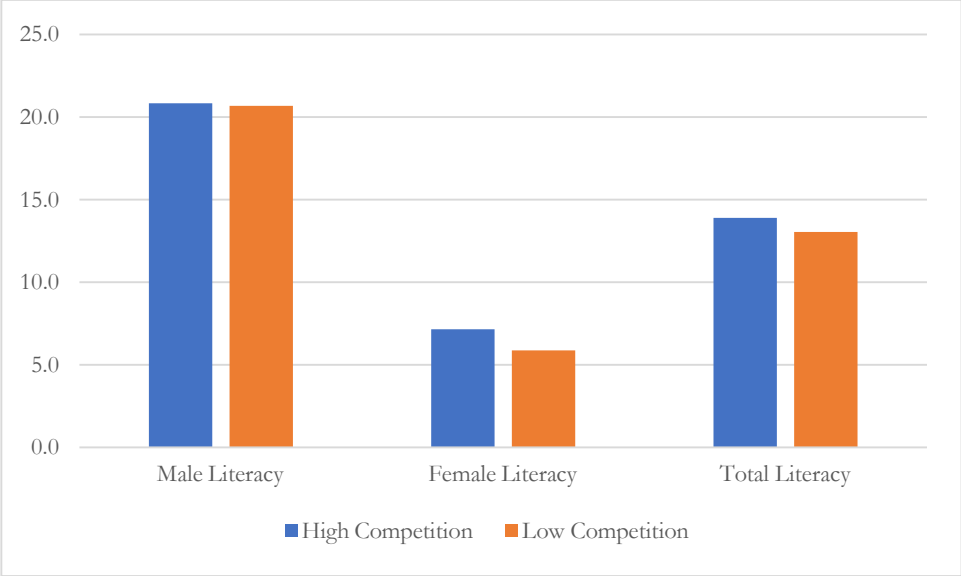
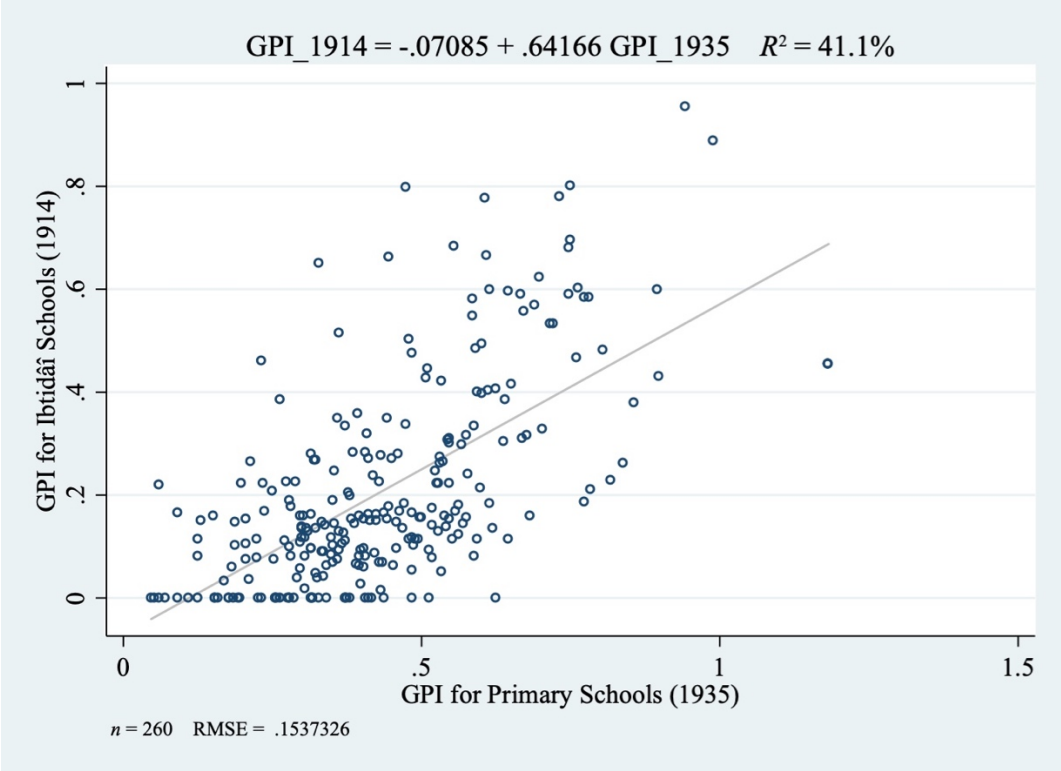


Figure A.9: Unconditional Relationship between Gender Parity Index in Primary Schools in 1914 and 1935



Conclusion

The origins of this project lay in understanding the ways in which countries that escaped colonialism tried to modernize and adapt to a world not of their own making. One dominant theme in such regions was the pressure these diverse continental empires were experiencing in the Hobbesian world of the late-nineteenth century. The era of high imperialism in which better equipped Western armies swallowed up territories across the globe made the prospect of becoming a future colony or protectorate all too real. Unsurprisingly, the initial reform attempts in these buffer zones centred on the military domain. Subsequent efforts at "catching up" aimed to build a modern state and bureaucracy, and included the first steps in the promotion of an educated mass capable of adapting to the military and economic requirements of the modern age.[102] The efforts at educational reform, like other areas, harboured an uneasy relationship with the West wherein elites struggled to incorporate the supposedly cultural neutral science and technology of the West while leaving the cultural realm untouched. All three articles presented here centre on the defensive modernization or self-strengthening in the educational field, one manifestation of the encounter between the Ottoman Empire and the West in the long-nineteenth century.

This dissertation relies on archival data from Boston and Turkey and a wide body of published primary and secondary historical search. It employs mixed-method comparative analysis to investigate the ways in which Armenian Patriarchate and Ottoman state

[102] The prevailing belief amongst the intelligentsia of the non-western world was that these other societies had to learn from the West in order to be able to guard themselves against the West. Whilst the answer to as to how to accomplish this best was rarely agreed on, the common strategy in this initial period can be characterized by what scholars term "defensive modernization" (Black 1967; Curtin 2002) – the idea is to incorporate the supposedly culturally neutral science and technology, while leaving the cultural realm untouched. This was, for example, the case with the modernization efforts of the Tanzimat reforms in the Ottoman Empire, the Wakon, Yosei-program in Japan, and Chinese Confucian reformism during the late nineteenth-century.

responded to Evangelical activities. Protestant missionaries have been an important part of the global diffusion of modern education, and the Ottoman Empire was no exception. American Protestant Missionaries started operating in the region in the 1820s and established an impressive number of schools catering to a significant portion of the non-Muslim Ottomans. They complemented existing local initiatives whilst also popularizing many pedagogical innovations previously unknown in the Middle East. That being said, the rapid expansion of missionary schools took place during a period of growing Western intervention in Ottoman affairs and thus fed into Ottoman fears that they were acting as foreign agents intent on destroying the empire. This paranoia is very much alive in Turkey today. Countless academic articles are penned chastising missionaries for the role they played in the breakup of the Ottoman Empire. The government of Turkey adopts a similarly suspicious stance towards missionaries. According to the Protestant Church Association Press secretary Soner Tufan, approximately 60 Protestants were deported in 2019 alone because they were considered a "threat to national security." (Kılıçdağı 2020).

The first article dives into this contentious literature to better understand the role missionaries played in the growth and formation of Armenian nationalism. An established literature claims that missionaries aided the development of Armenian nationalism by alienating Armenians from their fellow Muslims, importing ideas related to nation building and standardizing the vernacular language. Using an original dataset of nationalists from the late Ottoman period, I demonstrate how these arguments fail to explain why most Armenian nationalists were educated in Armenian schools. This finding informs the second part of the article where I reorient the debate within Turkish historiography by shifting the spotlight onto the contentious relationship between Ottoman Armenians and American Protestants. Through a narrative analysis based on archival data and primary and secondary sources, I show that out of the antagonistic encounter between both parties came a renewed impetus

to build new schools, reach a larger segment of the Armenian population and reform the educational system. All three factors were essential in expanding nationalist ideas beyond the confines of major cities and played a crucial role in the strengthening Armenian nationalism.

The second and third articles empirically test the insights gained from the first article. Specifically, I claim that competition between different types of schools aided the dissemination and popularization of pedagogical innovations. To this end, I build an entirely original HGIS dataset that combines contemporary socio-economic statistics, geographic information, and historical population and schooling data from archival sources. Both these articles contribute to the quantitative literature on missionaries which claims that the presence of historic missionary societies is positively associated with increased educational attainment and economic outcomes today. One shortcoming of this growing literature has been the inability to specify whether this established relationship is the result of missionary investments in human capital or local actors intensifying their investments in education as a response to missionary activities. Articles 2 and 3 step fill this gap and provide evidence of human capital spillovers across ethno-religious lines. Using the historical experience of Ottoman Turkey, I am able to discount any possible direct effects that might be the result of Protestant or Armenian investments in education. Rather, the robust link between educational competition in the past and contemporary socio-economic development today indicates that Muslim educational expansion was partially a reaction to Christian developments in education. Both articles strengthen this claim by examining Ottoman schooling and enrollment figures and complementing this with a narrative analysis.

In the second article I show how regions with a heightened missionary presence and an active Christian educational market perform better on the Gender Parity Index for pre-tertiary schooling during both the Ottoman and Turkish periods. To this statistical finding, I add archival evidence, demonstrating how missionary-triggered competition led to the

broadening of educational provision by the Armenian Patriarchate and Ottoman state and led to an institutionalization of female education.

The third article, on the other hand, uses the findings of the second paper to investigate the link between gender parity and economic development. A large literature argues that improvements in gender parity correspond to economic development. The results in this paper confirm this link over the long-term, showing that competition—working through gender parity—had positive human capital spillovers for the Muslim population and is a significant factor explaining subnational variations in economic development in Turkey today. Results demonstrate that places with historically heightened competition between missionary schools and native educational institutions are more likely to have higher income, as measured by night-time light density.

My main purpose with these three distinct yet interconnected articles was to discover, describe, and understand the ways in which missionary-triggered competition had broader societal consequences. In doing so I speak to two specific literatures and try to put oft-cited arguments within these academic bubbles under further empirical scrutiny. The dissertation does so by placing the missionaries in the historical and social context they were operating in and recognizing them as actors of an emerging Ottoman education system. The qualitative literature on missionaries has begun to acknowledge that evangelical activities were not only about conversion; they had far-reaching social consequences even for the groups that rejected the evangelical message. This is most true in the Ottoman Empire where Protestant conversion attempts bore little fruit (Makdisi 2008). Turkish scholarship commonly depicts Protestant missionaries as corrupt external actors working in collusion with Ottoman Christians intent on destroying the empire. This narrative overlooks the fact that Ottoman Christians frequently resisted missionary operations and tried to counteract them by stepping up their educational efforts. It also ignores the fact that many missionaries were Ottoman

citizens (after 1869 Citizenship Law). The "Ottoman-Americans", in turn, were born in the region and commonly identified themselves with the communities their parents tried to proselytize. Many others still were local Christians who had converted to Protestantism for their own personal, material or spiritual gain.

A mirror image of this interpretation can also be found in the quantitative literature in economic history, political science and sociology that claims that missionary investments during the colonial period had a range of positive effects. This perspective tends to view non-Western societies as empty vessels in which missionary technologies were transferred into, disregarding in the process the ways in which local institutions adapted to and changed as a result of missionary activities. Thus, the first contribution of this dissertation has been bringing in indigenous voices into the quantitative study of missionaries.

Identifying competition as social form with concrete socio-economic consequences is my second contribution. Competition is recognized as an important mechanism of change in economic sociology but is rarely investigated in political or comparative historical sociology. The argument here is similar to that proposed by Adam Smith in *The Wealth of Nations* several centuries earlier: that is, self-interested behaviour in mutually competitive exchanges, unintended by the actors, often produces some social or economic good. The missionaries posed an important challenge to the unifying power of the Gregorian Church. The existential and financial crisis born out of this challenge created a significant impetus for change. Yet, in expanding beyond major cities, prioritizing the education of girls, modernizing the curriculum, the Armenian Patriarchate was only intending to curtail defections to Protestantism and hold on to its position in Ottoman society. Self-interested as it may be, this led education to an expansion of education in society. This same insight can be extended to the ways in which the Ottoman state responded to the differential modernization taking place between its Christian and Muslim subjects. It is important to

note that self-interest should not be confused with selfishness or greed. Self-interest only makes sense in the atmosphere of mutual cooperation and is both driven and retained by a desire for approval. In an empire in "decline" where a rising Christian middle-class met the Muslims' anxieties, this desire for approval could have acquired a force of its own.

The use of GIS technology in Ottoman studies are rare but on the rise (Arbatli and Gokmen 2018; Stanev, Alvarez-Palau, and Martí-Henneberg 2017; Kabadayi, Gerrits, and Boykov 2020). This study marks one of the first efforts to apply GIS technology to the study of the Ottoman Empire. I have created Ottoman-era administrative boundary files that possess unique value for future research. I have also built and geocoded an entirely new dataset of Protestant mission settlements. For each settlement, I document the exact geographic location, the educational investments, as well as geographic and historical characteristics. In doing so, the information contained here also serves as a database of villages that have undergone name changes from the transition from the Ottoman Empire to the Turkish Republic. Whilst my project focuses on the legacies of educational institutions, future scholars can use the blueprint here for their own particular projects. Benefitting from this research are not only quantitative historical studies, but also a larger foundation of anthropological, political, and historical work that deals with the multi-ethnic past of modern-day Turkey. Producing these data is amongst the most significant contributions of the present work.

This study reiterates the importance of geography or environment in human capital transmissions. Social interactions with skilled neighbours raise parental aspirations for their children, inducing them to invest more in their education. This effect has been captured in the literature by concepts such as "neighbourhood effects" or "peer group effects." The present dissertation provides evidence for such effects in a pre-industrial and largely agrarian society. It also makes an additional contribution to this literature, demonstrating that such

human capital spillovers can occur across ethno-religious lines. This is especially noteworthy since late Ottoman period is described as a deeply divided society where social distance between ethnic groups was widening.

The dissertation provides important insight into historical determinants of economic growth in Turkey. One of the contributions of this study was to suggest and substantiate that Ottoman era investments in education are among the long-term determinants of Turkish economic growth. Ottoman-era male and female rüşdiyye schools are consistently associated with economic development, as proxied by nighttime lights. I have also shown how gender parity in the Ottoman-era ibtidâî schools is a significant predictor of gender parity in educational attainment today. In showing that history matters and that it can have long-term persistent impacts, this dissertation speaks to the growing historical development literature (Robinson, Acemoglu, and Johnson 2001; La Porta et al. 1997). Moreover, in showing how local institutions responded to evangelical missionaries the three articles demonstrate the persistent impact of religious events and specifically the Protestant religion in shaping our present world.

This dissertation diverges from previous works in the historical development literature by examining a non-Western, non-colonized, multi-ethnoreligious contiguous empire that was trying to survive in the highly competitive environment of the more developed empires.[103] Such places usually had imperial structures representing a world religion and had long-standing cultural identities and histories of statehood contained within approximately the same borders. Conversions to Protestantism was not common, and elites often perceived missionaries as a threat. Furthermore, these contiguous empires had the

[103] The one exepction to this generalization might be the study of China were an incipient literature on historical events as important determinants of current economic performance has taken root (Bai and Kung 2015; Jia 2014a; Jia 2014b).

institutional resources and freedom to create a public schooling system of their own. Taken together, these characteristics make it more likely that we observe indirect or reflex effects in non-colonized contiguous empires.

Furthermore, non-Western and non-colonial societies are particularly good sites for "investigating the global-local link and the diffusion and local assimilation of global ideologies" (Sohrabi 2005: 307). The examination of competition between different educational institutions was undertaken not only to expand the knowledge on the historical particularities of the Middle Eastern region, but also contribute to the general understanding of the origins of educational attainment and literacy around the world, especially in other places with long-standing indigenous institutions.

Single-outcome researchers "should not assume, ex ante, that the truth about their case is contained in factors that are specific to that case" (Gerring 2006: 717). Yet, it is unlikely that colonized regions display the dynamics outlined here. This is one limitation of the present study. Colonial administrators most commonly relied on missionary schools for educating the population and limited the existence of indigenous education. Therefore, in the absence of a plural educational system we are unlikely to observe the consequences of a competitive dynamic outlined in this dissertation.

This study also carries several implications for future research. Studies of historical long-run determinants of economic development need to focus on mechanisms more clearly. Research in this field too often focuses on establishing associations and discounting endogeneity. Whilst these are important parts of any good statistical research, the mechanisms are usually not clearly delineated. In articles 2 and 3, I was able to use the historical experience of Ottoman Turkey to separate direct and indirect effects. This method might not be exportable to other regions. That being said, scholars need to establish the ways in which historical events continue to persist. This might require additional historical data or

can be achieved by performing mixed-method analyses that include historical data that allows them to contextualize the associations they claim establish.

Relatedly, further research is needed to further our understandings into the ways in which local populations reacted to missionary expansion. One fruitful area of research would be separating the supply and demands sides of such responses. How much were state expansion of education into the peripheries the result of local demand? A final point concerns the heritage of early investment in Ottoman Turkey. Future studies could investigate how the Ottoman legacy in education was used and incorporated into the Turkish educational system. The literature on education in Turkey indicates that the newfound republic inherited the education materials of the Ottoman Empire (Fortna 2010). Local accounts of educational history show that ibtidâî and rüşdiyye schools were commonly utilized by the Turkish state. Similarly, we know that many Armenian schools were converted into Turkish schools. Future studies could examine the subnational variation and examine how the Turkish state integrated Ottoman schools into its educational system. Both these issues would aid our understanding of subnational variation in human capital and illuminate how certain regions in Ottoman Turkey might have gained a head start.

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