

# **Church and Human Capital: Evidence from Korea during 1884-1930**

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I used Korean data from 1884-1930 to see whether the church accumulates human capital, which is crucial to economic prosperity. I identified the causality by exploiting mission stations where the protestant missionary lived, served the medical service, and taught. If a church were established in a county, the literacy of both sexes would increase. However, there is an effect only on female elementary school enrollment. Therefore, I propose the church also improve the unequal perception between sex. Koreans then considered paying their daughter's education fees a waste and expected women only to learn house practices.

## **I. Introduction**

I found that the protestant church not only taught how to read but also contributed to relieving the inequality of the education between sex from 1930 Korean data. I made a list of churches established from 1885 to 1936 by county and used the mission station as an instrumental variable to identify the causality of the church on literacy and elementary school enrollment. Although the protestant missionary pursued self-support for every church, the support from the mission station cannot be neglected. If a church were founded in a county, then the county's total literacy and its girl's enrollment would increase. The time was crucial for women, but the church's evangelistic efforts under the missionary's instruction led locals to be more favorable to women's education. Therefore, the head of the household was willing to pay their daughter's school fees.

Some papers studied the association between religion and human capital. Clingingsmith et al. (2009) showed the winner of Pakistan's lottery that randomly allocates Hajj visas for pilgrimage to Mecca, displaying a better attitude toward female education. Becker and Woessmann (2009) checked the Weber thesis using nineteenth-century Prussia data by adopting the shortest distance from Wittenberg. They argued that rather residents saved more due to the protestant ethic, the founded elementary school in the past derived the county's high literacy. Kersting et al. (2020) used the Prussia data from the same period but concluded that the difference in the literacy rate stems from the central government's discriminatory policy on ethnicity. Believers allocate their resources to religious activities, deterring the cohort's or country's economic growth (Barro and McCleary 2003; Campante

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and Yanagizawa-Drott 2015; Montero and Yang 2021). Cantoni (2015) argued that Protestantism does not affect economic growth. The missionaries who went to China contributed to China's today economic growth and the development of the city (Bai and Kung 2015; Chen et al. 2022).

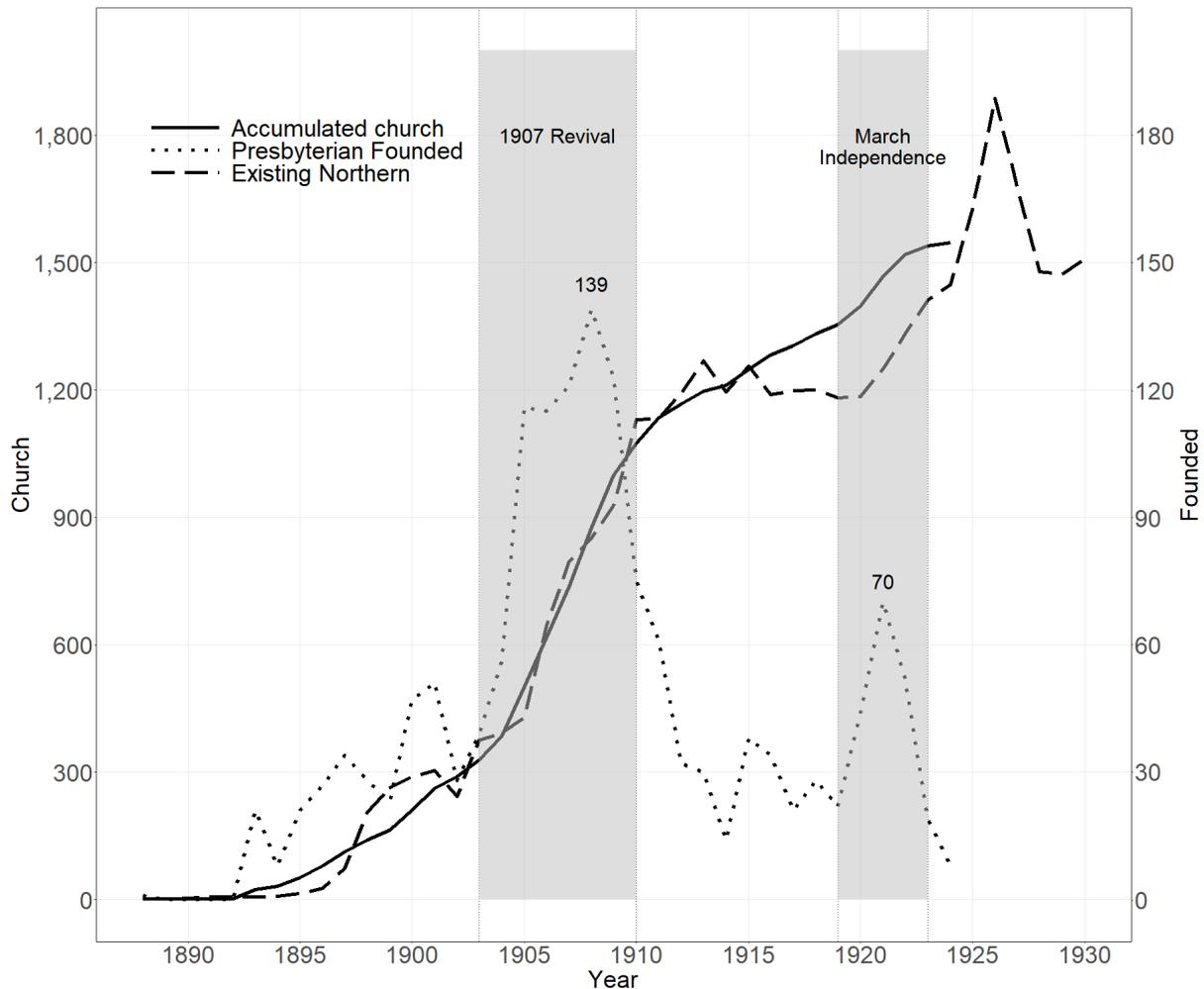
I contributed to the field: (1) I used Korean data to present that the protestant church improved the human capital. (2) Religion contributed to diminishing the education gap between the sex. The missionary's effort for women to acquire how to read was significant because they wanted all people from young to old to read the bible themselves. The number of elementary schools in early twentieth-century Korea increased since 1918; therefore, the effects of school education on literacy were too short to measure in 1930. Moreover, the perception of the women's role was limited to house practices, considering female education was a waste. The missionary achieved their intention for women to reason, widen the horizon, and deserve social lives to some extent.

## **II. Background**

Until 1884, the Chosun dynasty who ruled peninsular, Korea, for over 500 years wasn't favorable to western visitors. The Catholics existed, though; the young king's father who was in power then persecuted them, executing over 8,000 believers between 1866 to 1872. However, the first protestant missionary, Horace Newton Allen, entered the country and others started to come after Japan changed the country's tightly closed foreign policy through military action. Missionaries opened the monarch's heart by providing medical services to people involving royal families and introducing a modern education system to the kingdom. These helped to relieve people's fear of the exotic appearance that the first-arrived missionaries had suffered.

The Presbyterian and Methodist Church comprised over 73% of total missionaries who entered Korea from 1884 to 1945, and the Salvation Army was only 8% next. The Northern Presbyterian Church in the USA sent to Korea over 22 percent. The Northern Methodist Church in the same country follows over 16%. The Southern Presbyterian, the Southern Methodist, the Canadian Presbyterian, and the Australian Presbyterian took over 35% (The Korea Mission Field, 1994). They spread evangelism throughout the country compared to other denominations that focused more on cities. The Presbyterians and Methodists unofficially agreed to divide the land to avoid the overheated competition in 1909.

The figure 1 shows the number of the Northern Presbyterian Church and the accumulation of every church founded in Korea from the other data.<sup>2</sup> Though the latest missionary, the Canada Presbyterian Church, officially arrived in 1898, the ministers itinerated the region or locals who established the church passionately. The church exploded at the start of 1903, and its enthusiasm stopped in 1910. That period, "Pyongyang Revival", ended with the new colony government's regulation and surveillance.



**Figure 1. Presbyterian Church of Korea during 1885-1930**

Source. Data from A History of the Presbyterian Church of Korea and History of The Korea Mission Presbyterian Church USA. Volume I(Rhodes, 1934)

The church had a hard time after Japan annexed Korea. The foreign doctors needed to take an exam to serve in Korea, and private schools required the government's approval to reopen. Thus, the number of the church stalled, and even worse, the Northern Methodists

<sup>2</sup> The first data only has the total Northern Presbyterian Church in annual, therefore, I calculated the accumulation of the data to show the similar trend of the church's growth.

reported that their probationers decreased (Stokes, 1947). The church expanded after the colony government changed their policy on Korea which suffered a large protest that claimed Korea's independence, called "March 1<sup>st</sup> Movement". However, the expansion was different than before in "Pyongyang Revival" because of the introduction of non-fiction books like philosophy and communism, and people's disappointment with the missionaries' political neutrality. Its growth decreased after 1928 because the fund from the missionary headquarters declined due to The Great Depression, and the colonial government reinforced its regulation by forcing people to worship the Japanese shrine. Although the missionary pursued converts to manage their own, the impact of the depression was huge.

When the missionaries stepped on the land, women's education and duty differed from men's. In the late nineteenth century, Korean women shouldn't stay in a room with men or talk to them. Moreover, fathers considered investing in their daughter's education a waste. Society thought that teaching house practices to girls were enough, while the atmosphere primarily supported boys' education for their success. Although when women started to stay with men didn't matter that much afterward, the head of the household was still reluctant to pay school fees for their daughters. Women also didn't recognize the inequality, as a student from *Ewha Haktang*<sup>3</sup> stated (KWC<sup>4</sup> Report, 1906):

"When I was in school, we did not realize as the girls do now what a privilege it is to be able to study."

The evangelists, especially females, wanted all women, from young to old, to read and write Koreans, broaden their narrow horizons, reason, and earn self-respect. A recorded speech of an elderly Christian woman to her granddaughter and other girls shows the recognition of women (Mattie Wilcox Noble<sup>5</sup>, 1901):

"You were born in a golden age and live in happy Christian homes. Any other girl of your age could never leave her home or have any of the happy times you can, when I was young."

The figure 2 presents the total children between 5 to 14, students who attended public elementary school, and the number of public elementary schools from 1910 to 1935. Public elementary schools dominated over 95% of the total in 1930 Korea (Park, 2020). The public

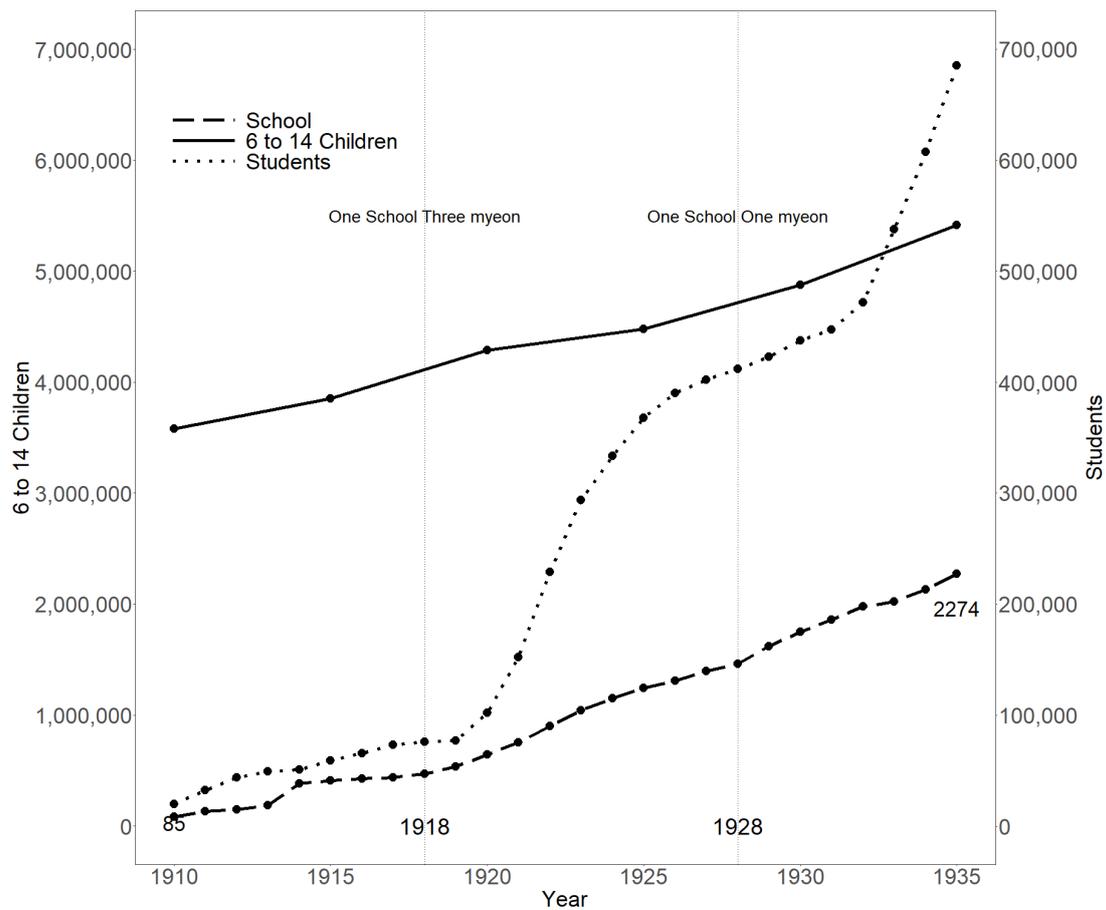
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<sup>3</sup> *Ewha Haktang* started as a Christian elementary school for only girls, which the Northern Methodist missionary Mary F. Scranton founded in 1886 and is now Ewha woman's university in Korea.

<sup>4</sup> Methodist Episcopal Church, Korea Woman's Conference, Report, p.6

<sup>5</sup> The Pyeng Yang Women's Bible Training Class, "Gospel in All Lands", June 1901, p.279

elementary school, *botonghakyue*, that taught Korean students in a modern way started to increase after the colonial government promulgated "one school per three *myeon*<sup>6</sup>" in 1918. The number again exploded after the government revised its education policy into "one school per one *myeon* district" in 1928. Although the growing speed number increased very fast, the educated students were small compared to the total number of same age groups. Only 0.27% of whole kids went to school in 1910, and the ratio increased to 12.64% in 1935, which is still low.



**Figure 2. Students, Population of age 6 to 14, School in Korea**

Source. Data from National Accounts of Korea 1911-2010(Kim, 2012) and Colonial Government of Chosen Statistical Yearbook

<sup>6</sup> The Korea district consists of "Do-Bu/Kun-Myeon-Ri" at then. *Do* is the province and *Bu* stands for the city. *Gun* is the county level and *myeon* is the unit of the town. *Ri* is the smallest administrative district.

### III. Data

I collected the Presbyterian church from "The History of the Chosen Presbyterian Church, " built from 1885 to 1922. The Chosen presbytery<sup>7</sup> gathered lists of every presbyterian church in the peninsula and Kando by receiving correspondence from local churches and examining facts. They wrote the main events of presbyterian churches and missionaries. I focused on the establishment of churches, which the book conveyed where, when, and how churches were founded. I used "The Record of Christian Methodist in Chosen, 1936" to add Methodist churches to the list. The Korean Methodist Church of Christianity, founded in 1930, wrote the book. It gives the location and the name of Methodist churches in 1936.

Next, I calculated the literacy rate of Korean and the enrollment in elementary schools in 1930 by combining the population Census and "The periodical of Chosen School" that the colonial government conducted in 1930. The Census recorded every resident by sex, whether they can use Korean or Japanese in the town unit. I calculated literacy by dividing the summation of those who can use Korean only and those who can use Korean and Japanese by the number of residents in the county. Also, I used children aged 6 to 14 from the Census and divided it by the total number of students in each county to build the enrollment rate. I combined the number of students by sex from the periodical.

I adopted the GIS information of each county office as the proxy variable of the representative church in the county from "March 1<sup>st</sup> Database from the National Institute of Korean History". Although 1919 data were available, it doesn't cause any bias because the main church of each county was built before 1919 and didn't change its location after 1919. Moreover, I substituted the location of the mission station where the missionaries and their family lived, taught, and served the medical service to the nearest church in the county. I will discuss the mission station in chapter 4.

There are variations between men and women in counties, as table 1 shows. The women who can read and write Korean comprise 7.5% of total women in the county compared to men's 35.6%. Although the female residents in the city are higher than in the rural areas, they are still lower than men. The enrollment and the total employment rate also differ between men and women. The Christians established an average of nine churches in a county from 1885 to 1936. There are some counties where churches weren't introduced.

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<sup>7</sup> The protestant Korean assembled in 1912. Although the organization consisted of Koreans, they interacted with missionaries a lot. George Engel who came Korea as the Australian missionary assumed the chief editor at first 1916, but the Korean took his place after 1925.

These counties had protestant churches, but the book didn't record the history of the church's foundation, and the power of the protestant church was weak, too.

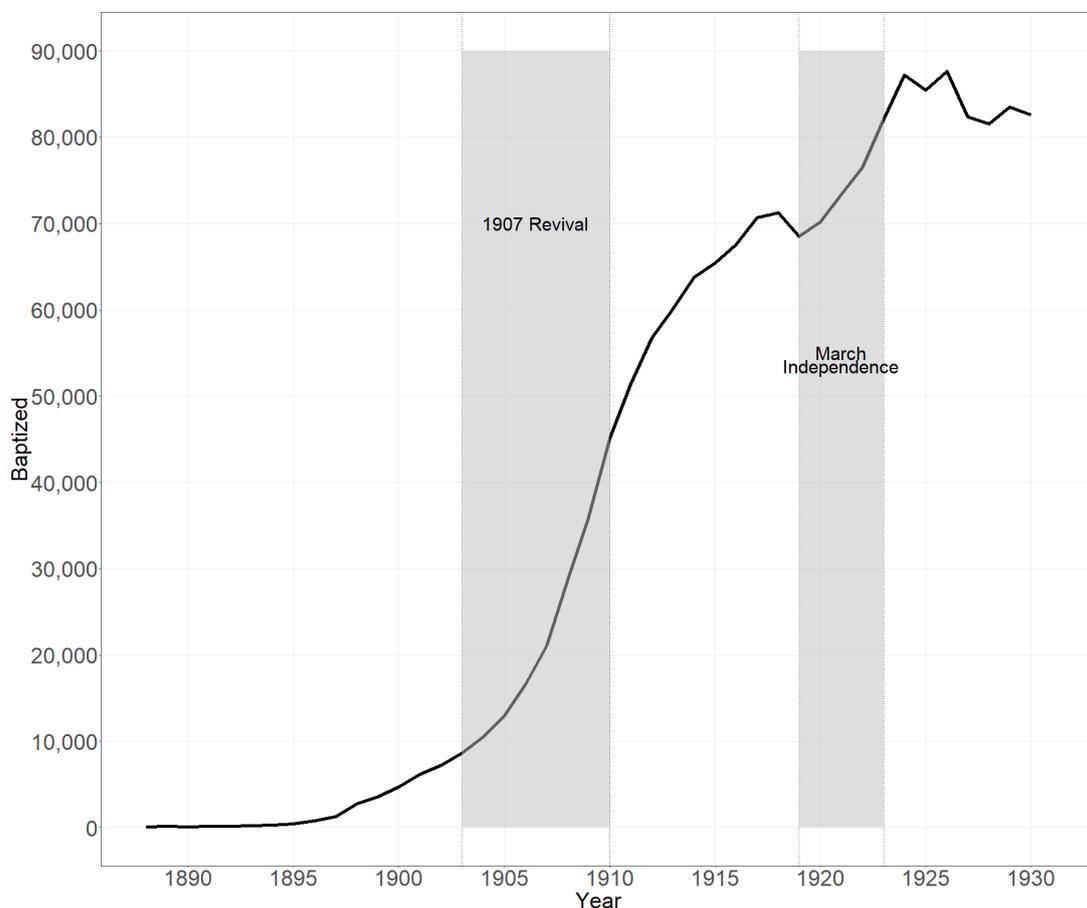
**Table 1. Descriptive Statistics in 1930 Korea**

	Mean	Std.Dev	Min	Max
<i>Outcome variables</i>				
Total literacy (%)	21.9	5.1	11.6	43.7
Female literacy (%)	7.5	4.2	1.5	29.8
Male literacy (%)	35.6	8.1	19.5	59.8
Total enrollment (%)	11.5	5.1	4.1	43.3
Female enrollment (%)	4.2	4.0	1.1	34.0
Male Enrollment (%)	18.3	6.7	6.5	51.7
<i>Explanatory variable</i>				
Church	9.36	8.72	0	62
<i>Control variables</i>				
Japanese ratio (%)	2.2	5.1	0.2	33.4
People from different province (%)	10.0	10.1	0.8	72.4
Population over 60 (%)	6.1	0.9	2.9	9.6
Population under 14 (%)	39.6	1.8	31.9	45.5
The ratio of schools to age 6 to 14	0.000449	0.00016	0.000122	0.001196
Total literate job (%)	8.9	8.3	2.8	49.2
Male literate job (%)	8.4	8.4	3.3	52.7
Female literate job (%)	12.0	11.0	1.5	56.2
<i>Other information</i>				
Area ( $km^2$ )	947.45	794.99	6.35	6165.3
Population density ( $per km^2$ )	407.58	1398.90	8.15	10896.63
Total employment (%)	46.9	7.9	29.2	62.8
Male employment (%)	60.2	2.4	49.2	70.6
Female employment (%)	32.6	16.0	3.4	62.6

*Source.* Data from the 1930 Population Census, the 1930 periodical of Chosen School, the History of the Chosen Presbyterian Church and the Record of Christian Methodist in Chosen 1936

*Note.* 233 observations.

There could be a doubt about using different periods of the church data. One might suggest the bias of omitting seven years of the presbyterian church or the Methodist church list of six years afterward. However, the figure 3 shows this difference doesn't cause a considerable bias. The line presents the sum of the baptized devotees of the Northern presbyterian, the Northern Methodists and the Southern Methodists. The number of baptized is a good measure of the protestant influence because the probationers must pass the test to get baptized.<sup>8</sup> The growth of the baptized is similar to the development of the church in figure 1. Therefore, the stable number of the baptized represents the church had converged. Song (2011) calculated that the church's growth under Southern Presbyterian in the Jeolla province was under 5% since 1928 like other presbyterian churches.



**Figure 3. Baptized Northern Presbyterian, Methodists in Korea**

Source. Data from History of The Korea Mission Presbyterian Church USA. Volume I(Rhodes, 1934) and History of Methodist Missions in Korea, 1885-1930(Stokes, 1947)

<sup>8</sup> Pastors and missionaries checked the applicant's faith of God by asking questions about bibles and whether the person had spread evangelism to neighbors.

## IV. Empirical Strategy

I assumed that if a church were established in a county, the literacy rate required for attendees to read the bible would increase. Since the perception of roles for men and women were different and missionaries strived to improve women's self-thought, I estimated the results of human capital by sex. Furthermore, the education given by the church could lead household's investment in the daughter's education.

The OLS estimation likely has biased results because of the city effect. The urban church may have a high positive correlation with human capital. People who could read and write preferred to move to the city for a better job, and most markets opened in each province's central city. Also, the city's mobility was high, leading churches to appear after the missionary started to iterate.

To check my hypothesis, I investigated the causal effects of the protestant church by estimating two stage least square equations:

$$(1) \text{ Church}_i = \alpha_1 + \beta_1 \text{Mission}_i + X_i' \gamma_1 + \delta_1 \text{Job}_i + \epsilon_{1i}$$

$$(2) \quad Y_i = \alpha_2 + \beta_2 \widehat{\text{Church}}_i + X_i' \gamma_2 + \delta_2 \text{Job}_i + \epsilon_{2i}$$

where  $\text{Church}_i$  indicates the number of founded churches during 1885-1936 in county  $i$ ,  $Y_i$  the dependent variables, such as literacy and enrollment by sex,  $X_i$  the control variables consisting of the province fixed effects, the Japanese ratio, residents from the different provinces, the share of population age over 65, under 14, and school per children of 6-14,  $\text{Job}_i$  the ratio of literate job to total job by sex.

I made mission station weight to secure the exogeneity of the church on the human capital. I multiplied the year when the station was established with the shortest distance from the church that locates nearest to its county's community center to other county centers. The protestant missionary built a house for their family to live in, a hospital to provide medical services to locals, and a school for teaching Christian ethics and modern education subjects. When the council of each protestant mission assigns a missionary to the mission station, they iterate the province to spread God's word by taking the station to the center to start.

If the county is closer to the mission station, residents have more chances to be exposed to the mission. When locals constructed a church, the missionary didn't lead but likely assisted later in the process and operation. The Presbyterian missionary followed The Nevius Plan that native churches should be self-supporting, including operating by their

native pastor and that missionary support should coincide with the native's desire.<sup>9</sup> The Methodists also pursued similarly to The Nevius Plan but more malleable for helping pastors (Stokes, 1947).

One might qualify that missionary built their station in cities. However, when each missionary decided on the station's location for each province, they considered the geographical mobility of the county within the province where later they could move easily and take refuge in possible when political events or war broke out. For example, the Northern presbyterian missionary didn't select Uiju county, the northwest county adjacent to China, for the mission station of the northern province but built it in Sonchon, located in the same province. Although the Uiju county had more churches and stronger Christian influence than Sonchon, the convenience of traveling by feet, trains or roads mattered more.

Although some stations were in cities enjoying the benefits of infrastructure that the colonial government introduced, most were built before the government constructed roads or developed any transportation. The colonial government designated 14 cities not because of the population but for military or political purposes and dwelling Japanese. Ten of them were port cities. It developed under the government's lead, outstripping the growth of traditional cities like Gwangju county (Lee, 2017). Since the colonial government inaugurated in 1910, 26 of 34<sup>10</sup> stations were already built before 1910.

## V. Results

The table 2 shows the results of OLS regressing the number of church's effects on literacy and enrollment. It is not surprising that the county's church positively correlates with literacy. Since the probationers must read the bible themselves, the missionary and the church taught how to read and write Korean. If a county has one more church established, the county's women's literacy rate is 0.09 percentage points higher than the other area. The church seems to have no relation with elementary school enrollment. It is true that besides the church's motivation of teaching women to reason, men aspired to learn or give education to their sons for success. Locales may attend church because of this motive, especially since English was popular then. Therefore, unlike women, the church should not affect men's enrollment.

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<sup>9</sup> However, missionaries built and managed girl's school themselves or financially supported the school because people were more reluctant to pay for their daughter's education (Stokes, 1947)

<sup>10</sup> Some cities like Gyeongseong(Seoul), Pyongyang and Wonsan had two stations each for the Presbyterians and the Methodists. I set Gyeongseong for Methodists, Pyongyang for Presbyterian, and Wonsan for Presbyterian for the analysis.

The IV estimation presents, shown in table 3 and table 4, that the church increased the human capital in the county. The first stage result of equation (1) indicates the farther the county has from the mission station and the more recently the station was built, the fewer the county has churches. This instrument identifies the causality of church effects on the county's literacy and enrollment. If a church was established in a county, it increased women's literacy of women 0.2 percentage points and men by 0.24 more in the county. The results are more than double for women and triple for men in OLS. Although OLS presents no effect of churches on enrollment, only the girls' enrollment increased 0.13 percentage points more as a church was introduced in the county.

**Table 2. OLS Results of Literacy and Enrollment**

Dependent variables	Literacy			Enrollment		
	Total	Men	Women	Total	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
Church	0.00090*** (0.00026)	0.00079* (0.00040)	0.00099*** (0.00018)	0.00026 (0.00024)	0.00033 (0.00038)	0.00019 (0.00013)
Japanese	-0.35213** (0.13896)	-0.10897 (0.19018)	-0.50781*** (0.12786)	-0.35634* (0.19424)	-0.23084 (0.20377)	-0.41395** (0.18892)
Population from different province	0.00884 (0.03596)	-0.01979 (0.05873)	-0.01230 (0.02865)	0.01514 (0.03506)	-0.03746 (0.04853)	0.04918* (0.02751)
Share of population age over 65	-0.75679** (0.30178)	0.51462 (0.47405)	-1.31720*** (0.22507)	0.05162 (0.32580)	0.01872 (0.46445)	0.22904 (0.25113)
Share of population age under 14	0.49067*** (0.18775)	1.08160*** (0.34563)	0.19747 (0.13570)	0.19813 (0.17168)	0.31136 (0.27041)	0.11008 (0.11310)
1000 school per age 6 to 14	0.02889** (0.01332)	0.06111** (0.02388)	0.00553 (0.00960)	0.08747*** (0.01861)	0.14727*** (0.03479)	0.03630*** (0.01184)
Share of literate male job in male job	0.55738*** (0.09468)	0.58373*** (0.12702)	0.57329*** (0.08879)	0.69024*** (0.13952)	0.75582*** (0.13668)	0.63594*** (0.13932)
Share of literate female job in female job	-0.04727 (0.02876)	-0.10233*** (0.03815)	0.01640 (0.02640)	0.05871* (0.02995)	0.08335* (0.04746)	0.02196 (0.01561)
Constant	0.02920 (0.08789)	-0.11249 (0.15585)	-0.00638 (0.06251)	-0.07828 (0.08800)	-0.07877 (0.12776)	-0.09917 (0.06623)
Observations	233	233	233	233	233	233
R-squared	0.75991	0.77984	0.77437	0.80313	0.71816	0.86993

*Notes.* Robust Standard errors in parentheses

The table 3 shows the difference in controlling the share of literate jobs in total jobs by sex. If a county's share of literate jobs is high, then people in that county aspire to learn

words. It also verifies the correlation between the literacy and Japanese ratio. If more Japanese live in a county, the literacy measured in Korean is likely to be low. The column (1)-(3) shows the wrong relation of Japanese without controlling the share of the literate job. The share of literate jobs solves this problem, as shown in column (4)-(6). It also makes the church's effects on human capital clearer.

This period preferred boys more than girls. The share of the population aged under 14 in the county positively correlates with men's literacy because most of the students who went to the elementary school were boys. Therefore, the ratio of school per child is the same, too. However, women didn't deserve education like men. The illiterate women accumulate as time passes, representing the coefficient of share of the population aged over 65 is negative. There is no statistical significance of either share of under 14 and the school ratio of women.

**Table 3. Two-Stage Regression Results of Literacy in 1930**

	Literacy					
	Total	Men	Women	Total	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
First stage regression	-0.00005***			-0.00005***		
Mission station weight	(0.00001)			(0.00001)		
Church	0.00297*** (0.00107)	0.00312** (0.00139)	0.00292*** (0.00102)	0.00224*** (0.00081)	0.00242** (0.00120)	0.00209*** (0.00067)
Japanese	0.37262*** (0.10394)	0.60160*** (0.12945)	0.29722*** (0.09395)	-0.36903** (0.15044)	-0.12954 (0.20068)	-0.52166*** (0.13701)
Population from different province	-0.00224 (0.04069)	-0.02695 (0.06231)	-0.02915 (0.03423)	0.02575 (0.03888)	0.00080 (0.06209)	0.00156 (0.03034)
Share of population age over 65	-0.60627 (0.50525)	0.76928 (0.64042)	-1.28176*** (0.47762)	-0.71677** (0.31328)	0.56337 (0.47870)	-1.28439*** (0.23654)
Share of population age under 14	0.02171 (0.26786)	0.66846* (0.39866)	-0.38096* (0.22563)	0.43721** (0.20199)	1.01649*** (0.35500)	0.15362 (0.13280)
1000 school per age 6 to 14	0.03335** (0.01563)	0.06493** (0.02630)	0.01116 (0.01318)	0.02962** (0.01371)	0.06200*** (0.02392)	0.00613 (0.00961)
Share of literate male job in male job				0.54096*** (0.10422)	0.56374*** (0.13902)	0.55983*** (0.09299)
Share of literate female job in female job				-0.03419 (0.03104)	-0.08640** (0.04102)	0.02712 (0.02681)
Constant	0.22979** (0.10338)	0.04784 (0.16078)	0.26120*** (0.08645)	0.03972 (0.09238)	-0.09967 (0.15895)	0.00225 (0.06114)
observations	233	233	233	233	233	233
1 <sup>st</sup> stage F-statistics	6.67	6.67	6.67	6.16	6.16	6.16

Notes. Robust Standard errors in parentheses

The table 4 gives the results of equation (2) on enrollment by controlling the share of the literate job. The colonial government divided elementary schools for Japanese and Korean. The coefficient of the Japanese ratio must be negative, but column (1)-(3) shows the opposite results. I controlled the literate job share to correct the bias presented in column (4)-(6). Moreover, Men migrated to cities during the colonial period, but women moved within the province because of marriage. I used the population from different provinces to control this effect. Adding the literate job gave the variable statistical significance and positively correlated with girls' enrollment.

**Table 4. Two-Stage Regression Results of Enrollment in 1930**

	Enrollment					
	Total	Men	Women	Total	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
Mission station weight	-0.00005*** (0.00001)			-0.00005*** (0.00001)		
Church	0.00247** (0.00112)	0.00232* (0.00135)	0.00231** (0.00096)	0.00143** (0.00069)	0.00115 (0.00102)	0.00139*** (0.00046)
Japanese	0.64835*** (0.11741)	0.89485*** (0.15655)	0.48258*** (0.08919)	-0.37107* (0.19638)	-0.24130 (0.20020)	-0.42906** (0.19408)
Population from different province	-0.00825 (0.04571)	-0.06944 (0.05822)	0.03012 (0.03796)	0.02987 (0.03505)	-0.02698 (0.04819)	0.06431** (0.02849)
Share of population age over 65	0.02289 (0.61104)	-0.05188 (0.69441)	0.26140 (0.55900)	0.08650 (0.33770)	0.04351 (0.45033)	0.26484 (0.28231)
Share of population age under 14	-0.55644** (0.28258)	-0.52637 (0.33790)	-0.53694** (0.24862)	0.15153 (0.17721)	0.27823 (0.26081)	0.06225 (0.12927)
1000 school per age 6 to 14	0.09489*** (0.02552)	0.15547*** (0.03956)	0.04261** (0.01898)	0.08811*** (0.01825)	0.14772*** (0.03359)	0.03695*** (0.01144)
Share of literate male job in male job				0.67594*** (0.14372)	0.74565*** (0.13969)	0.62125*** (0.14226)
Share of literate female job in female job				0.07011** (0.03345)	0.09145* (0.04971)	0.03366* (0.01942)
Constant	0.28076*** (0.10370)	0.32775** (0.13167)	0.20115** (0.08881)	-0.06911 (0.08756)	-0.07225 (0.12207)	-0.08975 (0.06977)
	233	233	233	233	233	233
1 <sup>st</sup> stage F-statistics	6.67	6.67	6.67	6.16	6.16	6.16

Notes. Robust Standard errors in parentheses

## VI. Mechanism

I propose two effects of the church on human capital in the county. One is the direct effect that the church taught people how to read Korean for the bible. The other is the indirect effect that though the missionary intended to help women to think themselves, the church also contributed to opening men's thoughts to whom the church's influence exposed about women's identity. The effects on girls' enrollment indicate that the head of households is willing to pay school fees for their daughter's education, which would be nonsense for those who lived in the late 19<sup>th</sup> century.

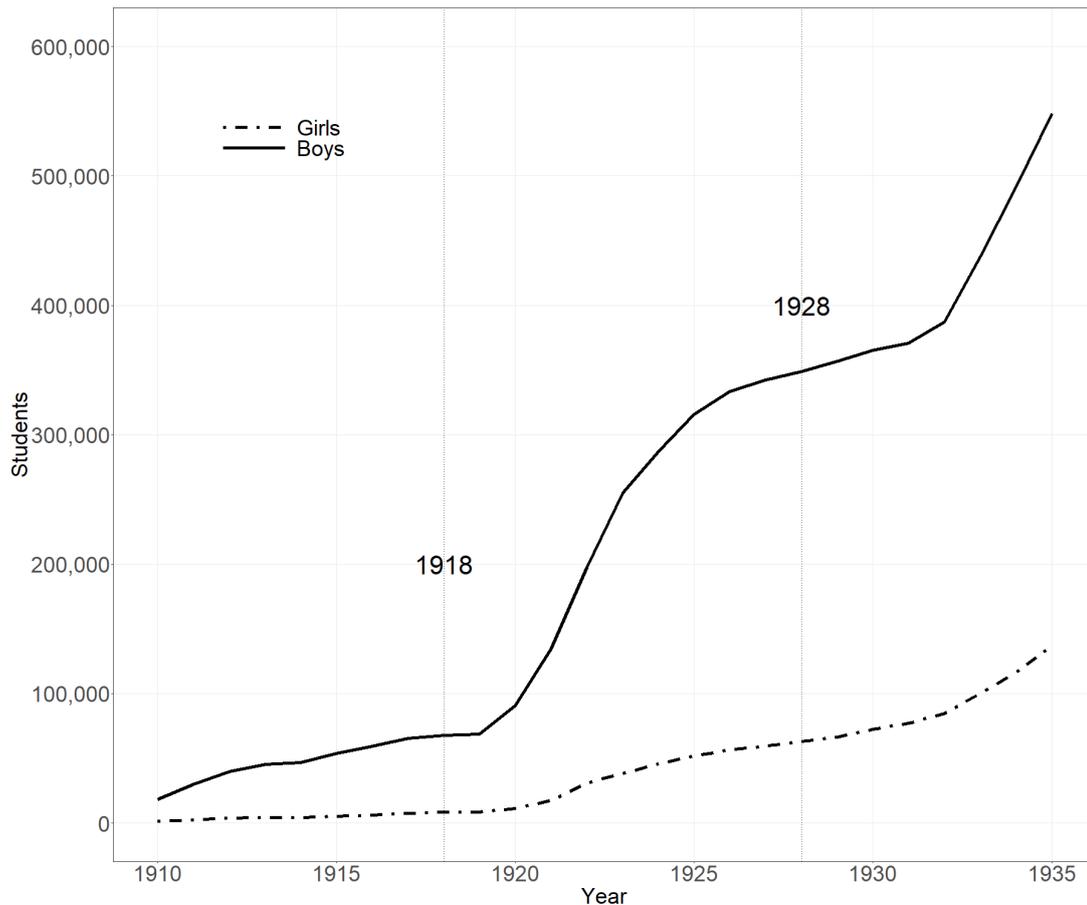
The increment of female literacy, 0.2% point, is large after a church was established in a county. The church did care for men how to read, but they also concentrated on female literacy. The average women's literacy rate in 1930 was 7.5% compared to men's 35.6%, shown in the table 1. The missionary reported in 1908 that the colporteurs whom the missionary instructed contributed much of the establishing and teaching of the young church (American Bible Society, Annual Report, 1908). The colporteurs not only sold Christian books throughout the country but also spread the evangelism that started in 1885. It means that many men can read Korean from 1885<sup>11</sup>, though the average literacy rate of men was one-third of the total.

However, the missionary considered the ignorance of Korean women as one of the most severe problems for developing the church (Stokes, 1947). The missionary had to teach women before conveying God's word, so they built schools for girls and organized Bible Women, sending them to rural houses to teach reading for the Bible study. Bible Women expanded their activity from cities to towns and villages, giving instructions to the church, explaining the Scripture to women, and encouraging church members. They consisted of old ladies who were usually over their forties and lacked elementary education because Koreans thought young women shouldn't travel around.

The church also indirectly contributed to relieving the inequality of sex education. Women weren't allowed to stay in a room with men, so early churches separated their service by sex. People viewed education for women were unnecessary. Although the elementary school didn't close to girls and increased in huge numbers in 1918 and 1928, the female students who went to school were small compared to male students. The figure 4 shows the growing number of students by each sex, confirming that people thought paying fees for their daughters was a waste

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<sup>11</sup> Appenzeller, Letter of September. 24, 1887



**Figure 4. Students in Korea by sex**

Source. Government-General of Chosen Statistical Yearbook

There were always demands for boys' education. The enormous growth of male students reflects the shortage of elementary schools as the number of schools and classes increased rapidly after the colonial government began to execute its declaration. The missionary record points out this demand:

"...I have been besieged all year with boys, young men and old men in regard to schools. From all sides comes the cry for schools, teachers and western learning (MEKMC Minutes<sup>12</sup>, 1906). "

The aspiration for education could be checked through the speech of the vice Governor-General of Korea, Ikegami Shiro, in 1928:

<sup>12</sup> Methodists Episcopal Church, Korea Mission Conference, Official Minute of the Annual Session.

"It should be pointed out that these days, some students are reading wrongful materials of false ideology and eager to receive higher education, only for the purpose of getting well-paying job, ... (Ikegami, S.<sup>13</sup>, 1928)"

When Methodist Mission Boards' funds declined, parents started to donate to the church, sustaining private schools to give privileges of education to their children (Stokes, 1947).

There are some explanations for this education. Oh and Kim(2000) proposed that this motivation for children's education and increasing schools was to raise a future generation for Korea striving for independence from Japan. Go and Park concluded differently that the local Korean elites founded the elementary school in their county to provide better education services for their children. Park(2012) showed that colonial government policy and locale wealth and donations mattered. The tuition fee that households must pay for their attending children steadily increased from 1914 to 1930 (Park, 2012).

Therefore, the church didn't lead the male education but partially affected the household's investment in their daughter's education. The statistical insignificance of churches on men's enrollment and the increase 0.13% point in females as a church was founded in a county reflect the history well. The old perception about women started to change as husbands stayed home and cared for their children when the wife went to Bible class. Those who were exposed to the church more than others at least considered their daughters to attend elementary school by paying the fee to the school.

There could be some mixed effects of the developed city that cause the bias of church effects on human capital. I used the shortest distance of 14 cities from each county as the instrumental variable to see the proper channel of the church on human capital. I also excluded 14 cities from the analysis to check whether the results were from the city or not. It is true that many denominations of other Christianity also gathered in the city because of better infrastructure, transportation, well-being, and higher population density.

The city church or church near the city, shown in the table 5, increased men's human capital bigger but smaller in women's than church effects. Considering that the demand for men's education was pervasive then, it is not appropriate to interpret the church spurred the desire for men's education. Thus, the distance from the city isn't the proper channel for the church's contribution to developing human capital.

The columns (3)-(4) of the church on literacy don't differ largely from the results, including 14 cities and the church on enrollment still has 99% statistical significance on girls' enrollment. However, the effects on enrollment decreased to 65% of the original results. This isn't surprising because even though the church and the missionary tried to permeate

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<sup>13</sup> Address of Vice Governor-General in provincial inspector of schools meeting.

evangelism into rural areas, the essential mission stations were located in cities like Gyeongseong(Seoul) and Pyongyang. Ruling out these cities weakens the enrollment results; nevertheless, the church affected the county's human capital.

**Table 5. Robustness Check about City Effect**

	Sex			
	Men	Women	Men	Women
	(1)	(2)	(3)	(4)
First stage regression	-0.06334***			
City distance	(0.01941)			
First stage regression			-0.00005***	
Mission Station weight			(0.00001)	
Church on literacy	0.00456***	0.00180**	0.00274**	0.00194***
	(0.00165)	(0.00071)	(0.00127)	(0.00069)
Church on enrollment	0.00368**	0.00081*	0.00026	0.00091***
	(0.00146)	(0.00042)	(0.00098)	(0.00032)
Control variables	YES	YES	YES	YES
observations	233	233	219	219
1 <sup>st</sup> stage F-statistics	6.67	6.67	6.84	6.84

*Notes.* Robust Standard errors in parentheses

## VII. Conclusion

I used 1930 Korean data to identify whether the protestant church encouraged human capital by sex. I examined the results using the mission station as the instrumental variable to solve the endogeneity. The county's literacy will increase if a church was founded in a county. Considering the inferior women's education, old perception of the women's role, and custom of unsociable women, the impact of the church's education on women is considerable. I found out the results on literacy were the same as with other studies.

Furthermore, I propose that the church contributed to opening people's thoughts about investing in their daughters' education. The aspiration for boys' education was overheated, occupying most of the elementary school attendees. People took investment for their sons for granted, but it was hard to imagine sending their daughters to school. My research shows that the church somewhat decreased the inequality in sex education.

There are records that Christian miners in Korea then were more diligent and better workers than others. Does the church encourage people's income or work attitude? This

question needs to be answered later; it requires the connection between the enlargement of human capital by the church and its economic activity.

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