

Supplementary Materials: The Effect of Pre-Colonial Ethnic Institutions and European Influences on Contemporary Education in sub-Saharan Africa

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1. Muslim states

As noted in Section 3, Muslim regions had lower demand for formal Christian education and still today these regions have lower levels of educational attainment (Bauer, Platas, & Weinstein, 2022; Daun, 2000; Frankema, 2012). Although we control for whether a surveyed individual identifies as part of the Muslim religion or not ($muslim_{iec}$) and time-invariant factors specific to Central, West and East Africa (α_r), which should account for the higher Muslim presence in West Africa relative to other regions, it is worthwhile to test whether our results hold when considering the influence of the Muslim religion on a regional level. An individual's religion may be associated with their demand for education, however, it is more likely that overall education provision depends on the openness of a community. To account for this, we calculate the share of individuals that identify as Muslim within the ethnic-country region, $muslimregion_{ec}$, and report results in Table S.1 below.

In column 1, we report main estimation results (similar to that reported in Table 3 column 5 of the manuscript) for ease of reference. Being part of the Muslim religion is negatively associated with the likelihood of being literate. In column 2, we control for the share of Muslim individuals. Findings suggest that a higher share of Muslim religious individuals in an ethnic-country region is negatively associated with an individual's likelihood of being literate. We then control for both an individual's religion and the share of Muslim religious individuals in column 3. We specifically control for West Africa, $west_{ec}$, in column 4 instead of the region fixed-effects we

Table S.1. Muslim Robustness Check

	Dependent Variable: $literate_{iec}$			
	(1)	(2)	(3)	(4)
$central_e$	-0.052*** (0.019)	-0.063*** (0.021)	-0.063*** (0.021)	-0.064*** (0.021)
$missions_e$	0.648*** (0.165)	0.644*** (0.165)	0.641*** (0.165)	0.636*** (0.164)
$central_e * missions_e$	-0.383* (0.224)	-0.316 (0.233)	-0.315 (0.233)	-0.307 (0.232)
$British_{ec}$	0.013 (0.027)	0.005 (0.027)	0.005 (0.027)	-0.001 (0.028)
$central_e * British_{ec}$	0.048 (0.036)	0.060* (0.036)	0.060* (0.035)	0.064* (0.035)
$British_{ec} * missions_e$	-0.515*** (0.167)	-0.518*** (0.166)	-0.516*** (0.167)	-0.511*** (0.166)
$central_e * British_{ec} * missions_e$	0.456* (0.239)	0.393 (0.244)	0.391 (0.245)	0.373 (0.241)
$muslim_{iec}$	-0.171*** (0.016)		-0.144*** (0.013)	-0.144*** (0.013)
$muslimregion_{ec}$		-0.213*** (0.029)	-0.070** (0.029)	-0.072** (0.030)
$west_{ec}$				-0.182*** (0.034)
Observations	717,963	717,963	717,963	717,963
R-squared	0.296	0.290	0.297	0.297
Region FE	Yes	Yes	Yes	No
Survey-Year FE	Yes	Yes	Yes	Yes
Mean dep. var.	0.512	0.512	0.512	0.512

Note: $literate_{iec}$ is a binary variable equal to 1 if an individual is able to read parts of or a whole sentence, 0 otherwise. $central_e$ is a binary variable equal to 1 if the pre-colonial ethnic region was classified as a large chiefdom or state, 0 otherwise. $missions_e$ is the log number of missionary stations by 1000 km^2 of land area by ethnic group. $British_{ec}$ is a binary variable equal to 1 if ethnic-country region was part of a former British colony, 0 if French colony. $muslim_{iec}$ is a binary variable equal to 1 if the individual identifies as part of the Muslim religion, 0 otherwise. $muslimregion_{ec}$ measures the share of individuals that identify as Muslim within the ethnic-country region. $West_{ec}$ is a binary variable equal to 1 if the ethnic-country region falls within Western Africa, 0 otherwise.

Standard errors in parentheses clustered by ethnic and country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

have included throughout our analysis. Across these results our findings hold and show that despite the influence of Muslim, the relationship between historical missionaries, colonial rule and contemporary education outcomes depend on pre-colonial political centralisation.

2. Aggregated Literacy

To further understand the variation taking place on a regional level, we calculate ethnic-country region literacy rates by survey year. We additionally aggregate our individual-level controls to ethnic-country region level, i.e. $\beta_8 X_{ec}$ in our estimating equation. Results are reported in Table S.2. Results again indicate that the association between present-day literacy and European influences, i.e. colonial rule and historical missionary activity, vary in the context of pre-colonial ethnic institutions such as political centralisation. Results support our main findings as pre-

sented in Table 3 of the manuscript.

Table S.2. Aggregated Ethnic Region Robustness Check

	Dependent Variable: $literate_{ec}$				
	(1)	(2)	(3)	(4)	(5)
$central_e$	0.003 (0.017)	0.002 (0.017)	-0.009 (0.019)	-0.016 (0.025)	-0.006 (0.025)
$missions_e$	0.209*** (0.036)	0.575*** (0.119)	0.194*** (0.037)	0.196*** (0.039)	0.658*** (0.160)
$central_e * missions_e$			0.087 (0.063)	0.076 (0.072)	-0.253 (0.199)
$British_{ec}$	0.054* (0.028)	0.074*** (0.028)	0.053* (0.028)	0.049 (0.031)	0.071** (0.029)
$central_e * British_{ec}$				0.013 (0.034)	-0.002 (0.036)
$British_{ec} * missions_e$		-0.400*** (0.119)			-0.505*** (0.161)
$central_e * British_{ec} * missions_e$					0.362* (0.212)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	1,024	1,024	1,024	1,024	1,024
R-squared	0.725	0.734	0.726	0.726	0.737
Region FE	Yes	Yes	Yes	Yes	Yes
Survey-Year FE	Yes	Yes	Yes	Yes	Yes
Mean dep. var.	0.475	0.475	0.475	0.475	0.475

Note: $literate_{ec}$ is the percentage of individuals that are able to read parts of or a whole sentence within an ethnic-country region. $central_e$ is a binary variable equal to 1 if the pre-colonial ethnic region was classified as a large chiefdom or state, 0 otherwise. $missions_e$ is the log number of missionary stations by 1000 km^2 of land area by ethnic group. $British_{ec}$ is a binary variable equal to 1 if ethnic-country region was part of a former British colony, 0 if French colony. Standard errors in parentheses clustered by ethnic and country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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