Examining the relationship between educational attainment and attitudes towards gender equality in Nigeria

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Abstract

Using novel survey data collected from the states of Kaduna and Edo in Nigeria's Northern and Southern Regions respectively, this study examined the relationship between educational attainment and attitudes towards gender equality. The measure for attitudes towards gender equality was derived from the question, "A university education is more important for a boy than a girl," with responses on a 5-point scale ranging from "strongly agree" to "strongly disagree." Educational attainment was measured on a 10-point scale ranging from "no formal schooling" to "master's degree or higher." Educational attainment was found to correlate positively with support for gender equality in the two states. Keeping all covariates at their mean levels, the analysis showed that a 1 unit increase in educational attainment increased the likelihood of respondents choosing the "strongly disagree" response category by 7 percent in Kaduna, and by 3 percent in Edo. Being female increased the likelihood of supporting gender equality in both states, while Muslim self-identification reduced the likelihood of supporting gender equality only in Kaduna.

Keywords: *Education, Gender equality, Religion, Kaduna State, Edo State, Nigeria.*

JEL classification: J16, I25, Z12

1.0. Introduction

Nigeria performs poorly in the area of gender equality. It had a rank of 168 out of the 191 countries that were ranked in the 2021 Gender Inequality Index (GII). Moreover, it had a score of 0.68, which is worse than the average scores for Sub-Saharan Africa and the world, which were 0.569 and 0.465 respectively. The Gender Inequality Index ranges from 0.000 to 0.900, with 0.900 denoting the highest level of gender inequality and 0.000 denoting the highest level of gender

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equality (United Nations Development Program 2022). Data from the World Values Survey (WVS) shows that Nigerians generally do not have positive attitudes towards gender equality. The Wave 6 survey, which was conducted in 2012 shows that 46.2 percent of Nigerians either "strongly agree" or "agree" that "a university education is more important for a boy than a girl." The Wave 7 survey conducted in 2018 showed that 41.7 percent of Nigerians still hold this view. The low support for gender equality in Nigeria becomes more apparent when it is compared with other countries like Germany and Australia where the estimates for 2018 were 4.2 and 2.3 percent respectively (Haerpfer 2022; Inglehart et al. 2014). Interestingly, data from the Round 7 Afrobarometer survey conducted in 2017 shows that 84 percent of Nigerians either "strongly agree" or "agree" that "girls and boys have equal opportunities to get an education" in the country (BenYishay et al. 2017).

Country-level data is insightful because it provides a holistic view, but it also masks the variations within the country. Attitudes towards gender equality may not be evenly spread across Nigeria – some places may have more positive attitudes towards gender equality than others. Nigeria is a multicultural society comprising of over 250 ethnic groups that have different customs. Moreover, Nigeria has a dyadic structure with a predominantly Muslim Northern Region and a predominantly Christian Southern Region. Both regions also differ in socio-economic terms, with the Southern Region outperforming the Northern Region when development indicators like the incidence of poverty and infant mortality are considered. A report by the Nigerian National Bureau of Statistics [NBS] (2020) shows that 59 percent of the population in Northern Nigeria live below the poverty line of 137,430 naira (approximately US$ 361) per annum. The estimate for the Southern Region is 17 percent. The mortality rate for children under five years old is 126 per 1,000 in the Northern region, while that for the Southern Region is 64 per 1,000 (NBS and UNICEF, 2017, 27). The cultural and socioeconomic disparities between the two regions may lead to variation in the attitudes towards gender equality among their populations.

This study relies on the Transnational Perspectives on Migration and Integration (TRANSMIT) survey data collected from the states of Kaduna and Edo, which are located in

Nigeria's Northern and Southern Regions respectively. The cultural and socio-economic conditions in both states reflect the contrasts between the larger regions in which they are situated: Kaduna has a poverty rate of 43 percent while the estimate for Edo is 12 percent (NBS, 2020). The TRANSMIT data shows that 34 and 13 percent of the households in Kaduna and Edo respectively do not have enough money to buy food. It also shows that the population in Kaduna is almost evenly split between Muslims and Christians, with both religious groups accounting for 56 and 44 percent of the population respectively. In Edo, 87 percent of the population is Christian, 11 percent is Muslim, 1 percent practice other religions besides Islam and Christianity, while the remaining 1 percent have no religion.

Exploiting the variation between Kaduna and Edo, this study examines the effect of educational attainment on attitudes towards gender equality. The survey instrument that was administered in both states incorporated the question from the WVS probing the degree to which respondents think a university education is more important for boys than girls. I used this item as my measure for attitudes towards gender equality. The responses are on a 5-point scale ranging from "strongly agree" to "strongly disagree." Educational attainment was measured on a 10-point scale ranging from "no formal schooling" to "master's degree or higher."

Although some studies have examined the determinants of attitudes towards gender equality in Nigeria, most of them are qualitative small-N studies (e.g. Adisa et al. 2021; Para-Mallam 2010; Abidogun 2007). The few that employ quantitative data often use it descriptively (e.g. Olarenwaju and Awogbayila 2021). With the exception of the study by Okonkwo (2013), none has, to the best of my knowledge, specifically examined the effect of education on attitudes towards gender equality in Nigeria. His study, which was conducted in Enugu State, relied on survey data ($n = 210$) collected from students in a secondary school, undergraduate students in a university, and working professionals. He analyzed the data using analysis of variance (ANOVA). His results showed that education had no statistically significant effect on attitudes towards gender equality, and females had more positive attitudes towards gender equality than males. This study differs

from the one conducted by Okonkwo (2013) in the following ways: First, I employ large-N data that is representative for the population in the states of Edo and Kaduna. Second, I analyze the data using econometric techniques. Lastly, my study is comparative in nature: I estimate identical regression models using the respective data from both states and make systematic comparisons between the results. This allows me to identify the determinants of attitudes towards gender equality that overlap between both states and those that are peculiar to a particular state. The identicality of the estimated models also makes it possible for me to compare the effect sizes between the two states. Given the spatial location of Kaduna in Nigeria's Northern Region, and Edo in the Southern Region, the results derived from each state could, to some degree, be applied to the larger regions where they are located.

This study finds that education correlates positively with support for gender equality in Edo and Kaduna. A plausible mechanism through which this happens is that education exposes the individual to different ideas that challenge customs and beliefs that might be opposed to gender equality. Education also creates a conducive environment that allows for the questioning of these beliefs and customs. The regression results also show that being female increases the likelihood of supporting gender equality in both states, while Muslim self-identification reduces the likelihood of supporting gender equality only in Kaduna. In Edo, religious affiliation has no effect on attitudes towards gender equality. Some nuances emerge when I compare subgroups across the two states: Muslims in Edo are more supportive of gender equality than both Christians and Muslims in Kaduna. Males in Edo are more supportive of gender equality than both females and males in Kaduna. This suggests that it would be misleading to lump respondents from both states into the same category based on gender or religious affiliation.

This study contributes to the broader literature on the determinants of gender egalitarian attitudes, especially those that emphasize the role played by education (e.g. Kyoore and Sulemana, 2019; Chatard and Selimbegovic, 2007; Zhang, Kao, and Hannum 2007; Shu, 2004; Kane, 1995) and religion (e.g. Glas and Alexander, 2020; Eidhamar, 2018; Lussier and Fish, 2016; Seguino,

2010) in the cultivation of these attitudes. This study proceeds as follows: Section 2 discusses the literature on the determinants of gender egalitarian attitudes and highlights the historical origins of Western education in Nigeria. Section 3 discusses the sampling strategy and operationalizes the variables that will be used to estimate the regression models. Section 4 presents the regression results and discusses them, while section 5 summarizes the study and concludes.

2.0. Theoretical considerations

McDaniel (2008, 59) defined gender egalitarianism as "a belief that men and women should attain a certain degree of equality within both public and private realms of society, and that women's status should not depend on their reproductive behavior." Relying on data from the WVS, she developed an index for attitudes towards gender equality for several countries around the world, which enabled her to make systematic comparisons between different regions and genders. She found that the difference in gender egalitarian attitudes between males and females was negligible in the United States and the countries of Western Europe. Conversely, the difference was pronounced in African and Middle Eastern countries, with females typically having more positive attitudes towards gender equality than their male counterparts. Her finding that females have more favorable attitudes towards gender equality than males have been corroborated by cross-country, country-level, and sub-country studies (e.g. Kyoore and Sulemana, 2019; Phinney and Flores, 2002; Dotti Sani and Quaranta, 2017; Zhang, Kao, and Hannum 2007).

Some studies have specifically examined the relationship between education and attitudes towards gender equality: In their study of Hispanics in the United States, Phinney and Flores (2002) found that education correlated positively with gender egalitarian attitudes. Their measure for gender egalitarian attitudes was derived from responses to four sets of questions probing the extent to which respondents support traditional gender roles. Greater support for traditional gender roles implied lower gender egalitarian attitudes and vice versa. Relying on the Wave 6 WVS data collected from five African countries (Ghana, Nigeria, South Africa, Zimbabwe, and Rwanda), Kyoore and Sulemana (2019) also found a positive correlation between education and support for gender

equality. This result has been replicated by Boehnke (2011), who relied on survey data from a pool of 24 OECD countries; by Levtov et al. (2014), who used survey data collected from men in eight low- and middle-income countries (Brazil, Chile, Mexico, India, Bosnia and Herzegovina, Croatia, Democratic Republic of Congo, and Rwanda); and by Shu (2004), who relied on representative survey data for China. An interesting element of Shu's finding is that the effect of education on gender egalitarian attitudes is larger among women than men.

A mechanism through which education could influence attitudes towards gender equality is socialization. Education "provides exposure to egalitarian ideas and, as a consequence, gender stereotypes tend to be questioned." (Boehnke, 2011, 60). Similarly, Balk (1997, 160) observed that "Conformity to traditional norms results partly from a narrow mind set. As education broadens the mind, it reduces conformity." Education correlates positively with labor force participation among women because it fosters the adoption of gender egalitarian attitudes and enables them to acquire relevant skills that improve their employability. This increases the capacity of women to contribute to household income, which in turn increases their bargaining power within the household and the larger community where they reside (Diwan and Vartanova, 2017). Conversely, some studies have found no relationship between educational attainment and gender egalitarian attitudes: In their study of adolescents in Egypt, Mensch et al. (2003) found no statistical association between education and gender egalitarian attitudes. They concluded that education "does not always challenge the expression of traditional attitudes for either sex or necessarily encourage wider horizons for girls." (p. 17). Dinçer, Kaushal, and Grossman (2014) had a similar finding in their study that was conducted in Turkey.

Some studies have also examined the relationship between religious affiliation and gender egalitarian attitudes, especially in relation to Islam. Kyoore and Sulemana (2019) found that Muslim self-identification reduced the likelihood of supporting gender equality in Africa. Relying on global data from the WVS, Alexander and Welzel (2011) found stronger support for patriarchal values among Muslims than non-Muslims. Lussier and Fish (2016) found that Muslim self-identification

and the proportion of a country's Muslim population both correlated negatively with support for gender equality. Glas and Alexander (2020) have criticized the preceding findings on the grounds that they put all Muslims into a single category while ignoring the differences between members of the group. Moreover, they contended that many Muslims in the Arab world do not view Islam and feminism as being mutually exclusive, as it is possible to hold feminist beliefs and at the same time be very religious.

It is difficult to disentangle Modern education from religion in Nigeria because the two are inseparably entangled. Modern education was introduced in Nigeria in the mid-sixteenth century by Portuguese Christian missionaries, but it did not gain traction until the mid-nineteenth century. Education was propagated by Christian missionary organizations like the Church Missionary Society, Wesleyan Methodist Society, and the Roman Catholic Mission among others (Ogunsola, 1974. 3-4). Until its capture by the British in 1903, most of Nigeria's Northern Region was part of an Islamic caliphate (i.e. the Sokoto Caliphate), which comprised several emirates (Abubakar, 1974). Upon the defeat of emirate forces and the eventual surrender of the emirs to British authority, the emirs requested that the British should not to tamper with their religious way of life (Ogunsola, 1974, 5; Kirk-Greene, 1965, 43-44). The British did not change much in the Muslim emirates (i.e. Northern Protectorate – after its conquest) when they took over. They appropriated the existing institutions and even employed the local Hausa language for administrative purposes (Diamond, 1988, 26).

The Northerners were hostile to Christian missionaries and were not open to Western education because they saw these as vehicles for propagating Christianity. "For many Muslims, schools and churches were synonymous." (Siollun, 2021, 270). The concern of the Northerners was warranted because school teachers often functioned both as "tutors" and "Christian evangelists." Education paved the way to Christianity "because it taught pupils to read and write in English, which in turn made it easier for them to understand the proselytizing of Christian evangelizers and to read the Bible." (Siollun, 2021, 267). Unlike the Northerners, the people in the

Southern Region were open to Christian missionary evangelization. Since education and Christian missionary evangelization often went together, this implied that the people in the Southern Region were more exposed to Western education than the Northerners.

In 1956, four years before Nigeria gained independence from British colonial rule, 1.9 million pupils were enrolled in primary schools across the country. Only 10 percent of these pupils were from the Northern Region; the remaining 90 percent were from the Southern Region. In 1963, three years after Nigeria's independence, primary school enrollment across the country rose to 2.9 million. Although the number of pupils from the Northern Region more than doubled – when compared to the 1956 estimate – Northern Nigeria accounted for only 14 percent of the total enrollments. The educational gap between the two regions was also present in secondary school enrollments (Helleiner, 1966, 433-444). The Northern Region's lagging position could be better appreciated when one considers the fact that it accounted for over half of Nigeria's population at that time (Helleiner, 1966, 430).

The legacies of the past tend to persist. 12 out of the 19 states in Northern Nigeria adopted Shariah law in the early 2000s, of which Kaduna was one of them (Nmehielle, 2004). In 2010, 43 percent of the population in Northern Nigeria were literate in English. The estimate for Southern Nigeria was 72 percent (NBS, 2010). Literacy in English is very important in Nigeria because English is the official language and the language of instruction in educational institutions. A poor knowledge of English thus impairs one's ability to advance educationally. The survey data collected from Kaduna show a correlation of 0.73 between educational attainment and English language proficiency. Furthermore, the data from Kaduna and Edo show an educational attainment gap between Muslims and Christians, with the latter group outperforming the former.

3.0. Data and methods

3.1. Sampling strategy

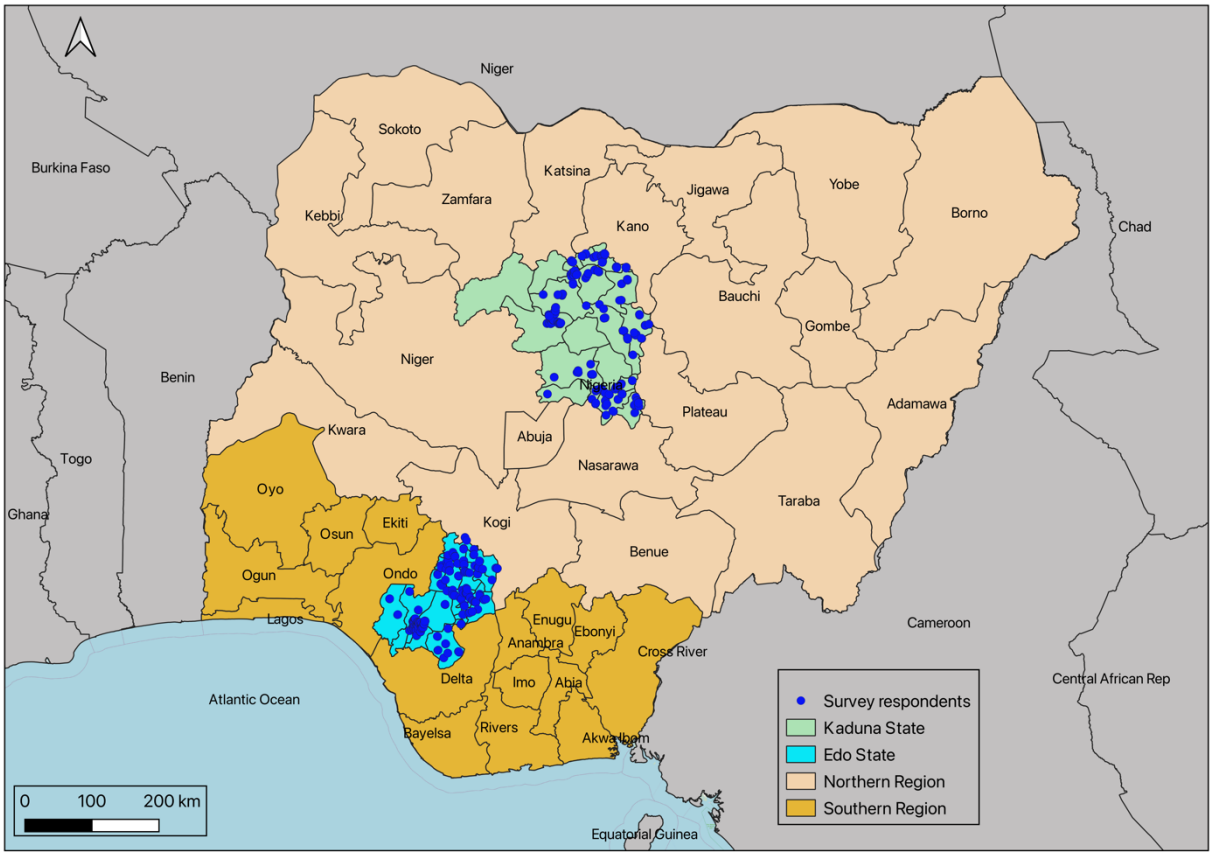

Figure 1: Case studies and the regions in Nigeria.

Note: The figure shows Nigeria's Northern and Southern Regions, the states of Edo and Kaduna – the case studies, and the geolocations of the survey respondents. The shapefiles containing Nigeria's administrative boundaries were developed by the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), Nigeria, and could be accessed here: https://data.humdata.org/dataset/nga-administrative-boundaries

As part of the Transnational Perspectives on Migration and Integration (TRANSMIT) research project, the WZB Berlin Social Science Center conducted a survey in the states of Kaduna and Edo in 2021. As shown in Figure 1, Kaduna is located in Nigeria's Northern Region, while Edo is located in the Southern Region. The respondents were at least 15 years old. 1,353 and 1,638 respondents were interviewed in Kaduna and Edo respectively. Multi-stage clustered random sampling was used to select the households where the interviews were conducted. Although the sampling strategy employed in both states was similar, it was not identical. This is because all the local government areas (LGAs) in Edo were accessible to enumerators to conduct interviews in, but four LGAs in Kaduna (i.e., Giwa, Birnin Gwari, Kauru, and Zangon Kataf) were unsafe areas for interviews due to the high risk of intercommunal conflict. These four LGAs were excluded from the sampling frame.

Grid cells of 5 x 5km, which were called precincts, were developed using QGIS software. These precincts were overlaid on a shapefile showing the administrative boundaries of both states. Each precinct was comprised of smaller 0.5 x 0.5km grid cells. Precincts were randomly drawn with replacement, with probabilities corresponding to the population sizes within each of them. From each of the selected precincts, smaller 0.5 x 0.5km grid cells were randomly selected with probabilities corresponding to the size of the population within them. The smaller grid cells were drawn without replacement. Within each of the smaller grid cells, an average of 12 and 18 households were interviewed in Kaduna and Edo respectively. The households were selected using a random walk approach, and the interviewee within the household was chosen using a simple random draw.

The slight difference between the sampling strategy employed in Kaduna compared to the one used in Edo is that the respondents in Kaduna was stratified according the population size in the senatorial district (each state in Nigeria comprises of 3 senatorial districts; each senatorial district comprises of LGAs). This was done to ensure that the exclusion of the four LGAs did not skew the sample. Samples were drawn within each of the senatorial districts in relation to their respective population shares. It is difficult to obtain recent population estimates for Nigeria from official government sources because the last population census was conducted in 2006. Due to this constraint, the population for both states was obtained from the 2020 Worldpop gridded dataset (Bondarenko et al. 2020).

3.2. Operationalization of the variables

3.2.1. Dependent variable: The dependent variable – "Support gender equality" – measures the attitudes of the respondents towards gender equality. It was derived from the question, "A university education is more important for a boy than for a girl," with responses on a 5-point scale ranging from "strongly agree" to "strongly disagree."

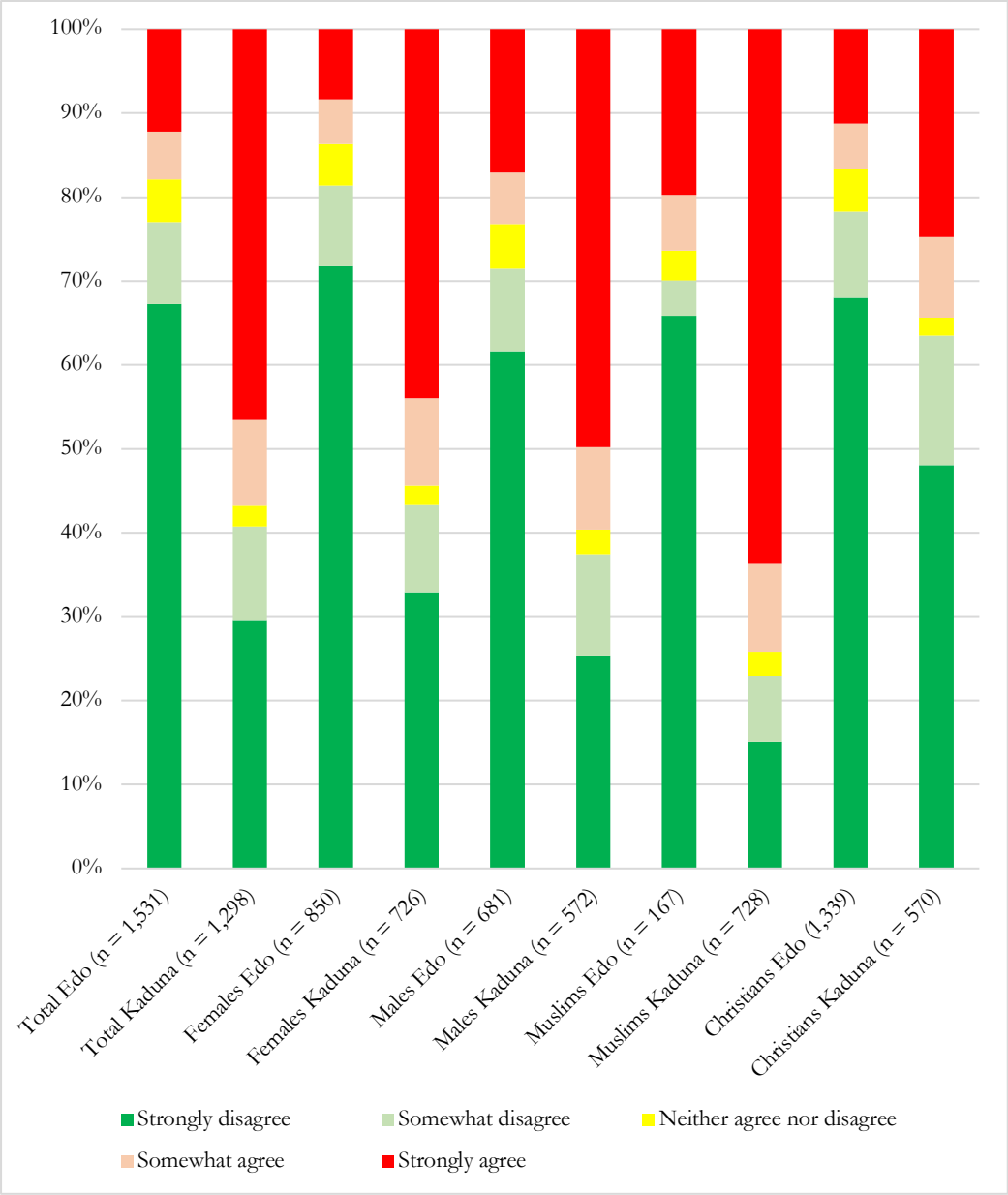

Figure 2: University education more important for boys than girls (Kaduna vs. Edo)

Note: The figure shows the respondents' responses to the question probing the relative importance of an education for boys compared to girls. The y-axis shows the percentage of respondents associated with each response category, while the x-axis shows the sample from which the percentages are calculated, which includes the full sample from Edo and Kaduna, as well as subsamples based on gender and religious affiliation.

Figure 2 shows that the population in Edo have stronger gender egalitarian attitudes than their counterparts in Kaduna. While 77 percent of them either "strongly disagree" or "somewhat disagree" that a university education is more important for a boy than a girl, the estimate for Kaduna is 41 percent. Disaggregating the data based on gender, I find that females have stronger gender egalitarian attitudes than males in the respective states. However, when I compare the genders across the states, I find that males in Edo have stronger gender egalitarian attitudes than

both females and males in Kaduna. 72 percent of males in Edo either "strongly disagree" or "somewhat disagree" that a university education is more important for a boy than a girl, while 43 and 37 percent of females and males respectively in Kaduna hold this view. Breaking down the data based on religious affiliation, I find that Christians are more supportive of gender equality than Muslims in the respective states. When I compare the religious subgroups across the states, I find that Muslims in Edo are more supportive of gender equality than both Christians and Muslims in Kaduna. 70 percent of Muslims in Edo either "strongly disagree" or "somewhat disagree" with the statement that a university education is more important for a boy than a girl. The estimates for Christians and Muslims in Kaduna are 64 and 23 percent respectively.

3.2.2. Explanatory variable: The explanatory variable – "Educational attainment" – measures the highest level of education that respondents have attained. It is measured on a 10-point scale, with 0 denoting "No formal schooling" and 9 denoting "Master's degree or higher." The mean level of educational attainment in Edo is 4.6, while that in Kaduna is 3.7, depicting an educational gap of 0.9 between the two states. 12 percent of the respondents in Kaduna have no formal education; the estimate for Edo is only 4 percent. Although males have a higher level of educational attainment than females in both states, the educational gap between the genders in Kaduna is twice the size of that in Edo: The mean educational attainment for males and females in Kaduna is 4.2 and 3.2 respectively, thus an educational gap of 1. The estimate for Edo is 4.9 and 4.4 respectively, has an educational gap of 0.5. Breaking down the explanatory variable based on religious affiliation, I find that Muslims have a lower level of educational attainment than Christians in both states, and the educational gap between the two religious groups is much larger in Kaduna than in Edo: The mean educational attainment for Christians and Muslims in Edo is 4.7 and 4 respectively, with an educational gap of 0.7. In Kaduna, the estimate is 4.6 and 2.2 respectively, with an educational gap of 2.4. When I compare the subgroups based on religion and gender across the two states, I find that Muslims in Edo are more educated than both Christians and Muslims in Kaduna. I also find that females in Edo are more educated than both males and females in Kaduna.

3.2.3. Control variables: I consider some control variables for the demographic attributes of the respondents, their income level, as well as the poverty rate in the LGA in which they reside. Each of them is discussed below:

Demographic attributes: Demographic attributes include gender, religious affiliation, marital status, and age. Gender takes a value of 1 if the respondent is female and 0 if male. Religious affiliation takes a value of 1 if the respondent is Muslim and 0 if Christian. All the respondents in Kaduna were either Muslim or Christian. However, 25 of the 1,638 respondents in Edo either practiced other religions besides Christianity and Islam, or had no religion. Since I am particularly interested in the relationship between Muslims and Christians, I treated the respondents who belong to neither of the two major religions as missing observations. This led to a marginal decrease in the number of observations in Edo. Marital status takes a value of 1 if the respondent is married or has ever been married, and takes a value of 0 otherwise. I classified divorcees and widows/widowers under the married category because divorce or the demise of a spouse does not necessarily do away with familial responsibility, especially if the union produced offspring.

***Household income*:** This measures the monthly income of the household on a four-point ordinal scale ranging from 1 to 4. It was derived from the question, "Regarding the income situation of your household in the last 12 months: Was the monthly household income less than (11,452/10,412/6,813) naira per month? By income we mean the incomes of all household members and all sources, including work, remittances, and other aid." Based on the responses to this question, I developed an ordinal variable with the following categories: 4 = Household's monthly income above ₦11,452; 3 = Household's monthly income above ₦10,412; 2 = Household's monthly income above ₦6,813; 1 = Household's income below ₦6,813. The monthly income thresholds were derived from a survey conducted by the NBS between 2018-2019. Households whose annual consumption expenditure was less than ₦137,430 were considered as poor. The monthly income threshold of ₦11,452 was derived by dividing the annual consumption

expenditure estimate by 12. The second and third categories were derived by dividing the annual lower poverty line (₦124,948) and annual food line (₦81.767) estimates by 12 (NBS, 2020).

Poverty rate: This measures the proportion of the population in the LGA where the respondents reside, who were living on less than US$ 1.25 per day in 2010 (Tatem et al. 2013). This dataset is part of Worldpop's Development and Health Indicators.[1] Since the raw poverty data is gridded, I computed the relevant statistics for the respective LGAs using QGIS software.

3.3. Descriptive statistics and analytical technique.

Table 1: Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Educational attainment	1297	3.665	2.181	0	9
Educational attainment#	1529	4.589	1.703	0	9
Gender	1321	0.557	0.497	0	1
Gender#	1570	0.553	0.497	0	1
Religious affiliation	1298	0.561	0.496	0	1
Religious affiliation#	1506	0.111	0.314	0	1
Marital status	1298	0.74	0.439	0	1
Marital status#	1531	0.639	0.481	0	1
Age	1321	34.391	14.004	15	85
Age#	1569	36.047	15.797	15	97
Poverty rate	1353	63.317	12.55	34.866	81.122
Poverty rate#	1638	43.315	8.831	26.034	54.685

University education more important for boys than girls		***Strongly agree*** **(0)**	***Somewhat agree*** **(1)**	***Neither agree nor disagree*** **(2)**	***Somewhat disagree*** **(3)**	***Strongly disagree*** ***(4)***
Support gender equality	1298	46.53%	10.17%	2.54%	11.17%	29.58%
Support gender equality#	1531	12.21%	5.68%	5.09%	9.73%	67.28%

Was the monthly income of your household in the last 12 months…		**< ₦6,813** **(1)**	**> ₦6,813** **(2)**	**> ₦10,412** **(3)**	**>₦11,452** **(4)**
Household income	1298	25.96%	18.95%	12.02%	43.07%
Household income#	1531	13.98%	10.52%	7.97%	67.54%

Note: *All the data are for the respondents from Kaduna, except for those with the symbol # which are for respondents from Edo.*
₦ is the naira sign, which is Nigeria's currency.

Table 1 presents the summary statistics of the data that will be used to estimate the regression models. Since this study is comparative, the regression models that will estimated using the data from the states of Kaduna and Edo will be identical. This allows for a direct comparison

[1] To access the poverty dataset visit: https://www.worldpop.org/

of the regression results from both states. The general form of the regression model could be expressed thus:

$$y_t = \beta_0 + \beta_1 Educational\ attainment_{it} + \beta_2 X'_t + \varepsilon_t$$

Where y_t is the dependent variable which measures the respondents' support for gender equality at time t, X'_{it} is a vector of control variables that have been discussed in the preceding section, β_0 is the intercept, β_1 and β_2 denote the coefficients of the explanatory and control variables respectively, and ε_t is the error term. Since the dependent variable is measured on a 5-point ordinal scale, the models will be estimated using ordered logistic regression, which is based on maximum likelihood estimation (MLE). Since the LGA was taken into consideration in the sampling procedure, coupled with the fact that one of the control variables – Poverty rate – is measured at the LGA level, it is possible that observations within the same LGA might be correlated. To mitigate this problem, I cluster the standard errors at the LGA level.

4.0. Results and discussion

4.1. Kaduna

Table 2 reports the results of regression models examining the relationship between educational attainment and support for gender equality in Kaduna. I added the control variables into the model in a stepwise manner to mitigate the problem of multicollinearity. Moreover, this prevents a scenario whereby the findings are dependent on the inclusion of certain control variables into the model. In model 1 – the baseline model where no control variables were added – *Educational attainment* carried the expected positive sign and was significant at the 1 percent level. This suggests that education has a positive effect on support for gender equality. A plausible mechanism through this occurs is that education broadens the horizon of the individual, allowing him or her to question norms and beliefs that might be antithetical to gender equality. This finding is congruent with those of Boehnke, (2011), Levtov et al. (2014), and Kyoore and Sulemana (2019). In model 2 where I controlled for the respondents' demographic attributes, the Akaike Information

Criterion (AIC) statistic declined from 3090 to 2903, indicating that model 2 has a better fit than its predecessor. *Educational attainment* retained its positive sign and remained significant at the 1 percent level.

Table 2: Correlates of support for gender equality in Kaduna State

Support gender equality$^{\phi}$	**Full sample**				**Gender and religious subsamples**			
	(1)	**(2)**	**(3)**	**(4)**	**(5) Male**	**(6) Female**	**(7) Muslim**	**(8) Xtian**
Educational attainment	0.415***	0.411***	0.367***	0.265***	0.355***	0.369***	0.383***	0.347***
	(0.043)	(0.038)	(0.038)	(0.022)	(0.062)	(0.05)	(0.052)	(0.054)
Gender		1.035***	1.012***	0.716***			1.049***	0.944***
		(0.11)	(0.115)	(0.067)			(0.176)	(0.151)
Religious affiliation		-1.246***	-1.283***	-1.056***	-1.359***	-1.195***		
		(0.267)	(0.241)	(0.191)	(0.246)	(0.272)		
Age		0.019***	0.016**	0.013***	0.009	0.022**	0.017*	0.014
		(0.007)	(0.007)	(0.004)	(0.008)	(0.009)	(0.009)	(0.009)
Marital status		-0.177	-0.091	-0.113	0.311	-0.456	0.074	-0.153
		(0.222)	(0.251)	(0.183)	(0.197)	(0.353)	(0.28)	(0.286)
Household income			0.104**	0.087**	0.072	0.132	0.02	0.17***
			(0.051)	(0.037)	(0.096)	(0.085)	(0.082)	(0.053)
Poverty rate			-2.014***	-1.479***	-2.686***	-1.511***	-2.611***	-0.449
			(0.512)	(0.403)	(0.624)	(0.53)	(0.539)	(1.242)
Constant				1.231**				
				(0.466)				
Intercept 1	1.372***	1.738***	0.519		-0.109	-0.151	1.392**	1.438*
	(0.261)	(0.451)	(0.592)		(0.637)	(0.686)	(0.609)	(0.812)
Intercept 2	1.859***	2.292***	1.082*		0.431	0.434	1.998***	1.959**
	(0.264)	(0.445)	(0.567)		(0.615)	(0.673)	(0.592)	(0.776)
Intercept 3	1.985***	2.436***	1.229**		0.601	0.563	2.19***	2.064***
	(0.271)	(0.446)	(0.559)		(0.593)	(0.668)	(0.61)	(0.764)
Intercept 4	2.561***	3.093***	1.895***		1.327**	1.188**	2.81***	2.769***
	(0.268)	(0.389)	(0.468)		(0.556)	(0.591)	(0.572)	(0.681)
Observations	1297	1297	1297	1297	572	725	727	570
Pseudo R^2	0.077	0.135	0.142		0.132	0.15	0.102	0.051
R-squared				0.317				
Log pseudolikelihood	-1540.165	-1442.753	-1431.1		-636.799	-789.81	1470.93	1419.416
AIC statistic	3090.33	2903.505	2884.199	-2338.04	1293.599	1599.62	-725.465	-699.708

Note: *ϕ is the dependent variable, standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. All models are estimated using ordered logit regression, except for model 4 which is estimated using OLS.*

In model 3 where I added two more control variables – *Household income* and *Poverty rate* – the AIC statistic further declined from 2903 to 2884, indicating that model 3 has a better fit than its predecessor. *Educational attainment* still carried a positive sign and was significant at the 1 percent level. Keeping all covariates at their mean levels, the analysis showed that a 1 unit increase in *Educational attainment* increases the likelihood to "strongly disagree" with the statement that a university education is more important for a boy than a girl by 7 percent.[2] *Gender* was significant at

[2] Table 1 in the appendix reports the marginal effects at the mean for model 3

the 1 percent level and carried a positive sign, indicating that being female increases the likelihood of supporting gender equality. Compared to their male counterparts, females are 18 percent more likely to "strongly disagree" with the statement that a university education is more important for a boy than a girl. This is consistent with the findings of Phinney and Flores (2002), Dotti Sani and Quaranta (2017), and Zhang, Kao and Hannum (2007). *Religious affiliation* was significant at the 1 percent level and carried a negative sign, suggesting that Muslim self-identification reduces the likelihood of supporting gender equality. Compared to Christians, Muslims are 23 percent less likely to "strongly disagree" with the statement that a university education is more important for a boy than a girl. This is consistent with the findings of Alexander and Welzel (2011), and Lussier and Fish (2016). Age carried a positive sign and was significant at the 1 percent level, indicating that people become more supportive of gender equality the older they become. This is congruent with the findings of Kyoore and Sulemana (2019), but contradicts other studies (e.g. Lussier and Fish, 2016) which find that younger people have stronger gender egalitarian attitudes than older people. *Marital status* was statistically insignificant. *Household income* was significant at the 5 percent level and carried a positive sign. A plausible explanation for this finding is that high-income households have sufficient resources to cover the educational costs of its members irrespective of gender, and education fosters the inculcation of gender egalitarian attitudes. *Poverty rate* was significant at the 1 percent level and carried a negative sign, suggesting negative correlation between the poverty rate in the LGA and support for gender equality. As a robustness check, I treated all the variables as continuous and re-estimated the model using ordinary least squares (OLS) regression. As shown in model 4, the results are consistent with those from the preceding models that are based on MLE.

To examine the heterogeneity within Kaduna, I disaggregated the data based on gender and religious affiliation and estimated some models using the different subsamples of respondents. Models 5 and 6 were estimated using the male and female subsamples respectively. *Educational attainment* carried the expected positive sign and was significant at the 1 percent level in both models, indicting a positive correlation between education and support for gender equality among

both genders. Keeping all covariates at their mean levels, the analysis showed that a 1 unit increase in *Educational attainment* increases the likelihood to "strongly disagree" with the statement that a university education is more important for a boy than a girl by 5 percent among men, and by 7 percent among women.[3] This shows that the effect of education on gender egalitarian attitudes is larger among women than men, which is congruent with the findings of Shu (2004). *Religious affiliation* carried a negative sign and was significant at the 1 percent level in both models. Keeping all covariates at their mean levels, the analysis showed that Muslim self-identification reduces the likelihood to "strongly disagree" with the statement that a university education is more important for a boy than a girl by 21 percent among men and by 24 percent among women.

Models 7 and 8 were estimated using the Muslim and Christian subsample of respondents respectively. *Educational attainment* carried the expected positive sign and was significant at the 1 percent level in the two models, indicating a positive correlation between education and support for gender equality among both Muslims and Christians. Keeping all covariates at their mean levels, the analysis showed that a 1 unit increase in *Educational attainment* increases the likelihood to "strongly disagree" with the statement that a university education is more important for a boy than a girl by 4 percent among Muslims, and by 9 percent among Christians.[4] *Gender* carried a positive sign and was significant at the 1 percent level in both models, indicating that among both Muslims and Christians, females are more supportive of gender equality than males. Keeping all covariates at their mean levels, the analysis showed that being female increases the likelihood to "strongly disagree" with the statement that a university education is more important for a boy than a girl by 10 percent among Muslims, and by 24 percent among Christians.

4.2. Edo

Table 3 reports the results of regression models examining the relationship between education and support for gender equality in Edo. The models are identical to those reported in

[3] Tables 2 and 3 in the appendix report the marginal effects at the mean for models 5 and 6
[4] Tables 4 and 5 in the appendix report the marginal effects at the mean for models 7 and 8

Table 2. *Educational attainment* carried the expected positive sign and was significant at the 1 percent level in model 1. When I controlled for the respondents' demographic attributes in model 2, the AIC statistic declined from 3255 to 3141, indicating that model 2 has a better fit than its predecessor. *Educational attainment* retained its positive sign and remained significant at the 1 percent level.

Table 3: Correlates of support for gender equality in Edo State

Support gender equality$^{\phi}$	**Full sample**				**Gender and religious subsamples**			
	(1)	**(2)**	**(3)**	**(4)**	**(5) Male**	**(6) Female**	**(7) Muslim**	**(8) Xtian**
Educational attainment	0.092***	0.149***	0.141***	0.091***	0.109***	0.168***	0.222*	0.139***
	(0.029)	(0.025)	(0.03)	(0.019)	(0.029)	(0.06)	(0.128)	(0.028)
Gender		0.541***	0.557***	0.427***			1.177***	0.479***
		(0.119)	(0.116)	(0.092)			(0.322)	(0.113)
Religious affiliation		-0.168	-0.173	-0.21	-0.423	0.122		
		(0.248)	(0.254)	(0.166)	(0.265)	(0.271)		
Age		0.001	0.001	0.003	0.007*	-0.005	0.022	-0.001
		(0.005)	(0.005)	(0.003)	(0.004)	(0.009)	(0.023)	(0.005)
Marital status		0.379***	0.364***	0.225*	0.375*	0.332*	0.337	0.375***
		(0.142)	(0.14)	(0.114)	(0.201)	(0.181)	(0.65)	(0.141)
Household income			0.092*	0.077**	0.016	0.163***	0.05	0.1*
			(0.052)	(0.036)	(0.071)	(0.063)	(0.119)	(0.057)
Poverty rate			0.478	0.159	-1.049	1.744*	0.669	0.426
			(0.855)	(0.524)	(0.909)	(1.008)	(2.016)	(0.883)
Constant				1.928***				
				(0.269)				
Intercept 1	-1.555***	-0.769***	-0.283		-1.026*	-0.355	1.507	-0.472
	(0.119)	(0.273)	(0.452)		(0.568)	(0.555)	(1.76)	(0.418)
Intercept 2	-1.104***	-0.31	0.176		-0.634	0.203	1.916	0.002
	(0.141)	(0.274)	(0.432)		(0.541)	(0.551)	(1.737)	(0.4)
Intercept 3	-0.793***	-0.002	0.486		-0.37	0.57	2.111	0.332
	(0.156)	(0.24)	(0.421)		(0.536)	(0.545)	(1.745)	(0.4)
Intercept 4	-0.302*	0.493**	0.982**		0.072	1.131**	2.32	0.87**
	(0.182)	(0.238)	(0.399)		(0.498)	(0.541)	(1.734)	(0.39)
Observations	1529	1504	1504	1504	657	847	167	1337
Pseudo R^2	0.003	0.015	0.016		0.014	0.015	0.044	0.014
R-squared				0.042				
Log pseudolikelihood	-1622.463	-1561.525	-1559.503		-735.162	-812.777	-163.95	-1386.215
AIC statistic	3254.925	3141.052	3141.006	5280.581	1490.323	1645.554	347.9	2792.43

Note: *ϕ is the dependent variable, standard errors are in parentheses, *** p<0.01, ** p<0.05, * p<0.10. All models are estimated using ordered logit regression, except for model 4 which is estimated using OLS.*

In model 3 where I controlled for household income and the rate of poverty, *Educational attainment* still carried a positive sign and was significant at the 1 percent level. Keeping all covariates at their mean levels, the analysis showed that a 1 unit increase in *Educational attainment* increases the likelihood to "strongly disagree" with the statement that a university education is more important

for a boy than a girl by 3 percent.[5] This contrasts with the case of Kaduna where the estimate was 7 percent. The smaller effect in Edo might be because its population, which is more educated than that in Kaduna, already have favorable attitudes towards gender equality. Thus, the effect of an additional unit of education causes a smaller change in attitudes. *Gender* was significant at the 1 percent level and carried a positive sign, suggesting that being female increases the likelihood of supporting gender equality. Keeping all covariates at their mean levels, the analysis showed that compared to males, females are 12 percent more likely to "strongly disagree" with the statement that a university education is more important for a boy than a girl. The estimate in Kaduna was 6 percentage points higher. Unlike the case of Kaduna where Muslim self-identification correlated negatively with support for gender equality, *Religious affiliation* was statistically insignificant in Edo. *Age* were statistically insignificant in Edo, but correlated positively with support for gender equality in Kaduna. *Marital status* carried a positive sign and was significant at the 5 percent level, suggesting that being married increases the likelihood of supporting gender equality. *Marital status* was statistically insignificant in Kaduna. Akin to Kaduna, *Household income* carried a positive sign and was significant at the 5 percent level. Although *Poverty rate* corelated negatively with support for gender equality in Kaduna, it was statistically insignificant in Edo. As a robustness check, I treated all the variables as continuous and re-estimated the model using OLS regression. As shown in model 4, the results are consistent with those from the preceding models that are based on MLE.

To examine the heterogeneity within Edo, I disaggregated the data based on gender and religious affiliation and estimated some models using these subsamples, just as I had done for Kaduna. Models 5 and 6 were estimated using the male and female subsample of respondents respectively. *Educational attainment* was significant at the 1 percent level and carried the expected positive sign in both models. Keeping all covariates at their mean levels, the analysis showed that a 1 unit increase in *Educational attainment* increases the likelihood to "strongly disagree" with the statement that a university education is more important for a boy than a girl by 2.6 percent among

[5] Table 6 in the appendix reports the marginal effects at the mean for model 3

males, and by 3.4 percent among females.[6] Similar to the case of Kaduna, the effect of education on support for gender equality is larger among women than men. *Religious affiliation* was statistically insignificant in both models, suggesting the absence of any correlation between Muslim self-identification and gender egalitarian attitudes among both males and females in Edo. This differs from the case of Kaduna where Muslim self-identification reduced the likelihood of supporting gender equality among the male and female subsamples.

In models 7 and 8, which were estimated using the Muslim and Christian subsamples of respondents respectively, *Educational attainment* carried the expected positive sign in both models. However, it was significant at the 10 percent level in model 7, and at the 1 percent level in model 8. Keeping all covariates at their mean levels, the analysis showed that a 1 unit increase in *Educational attainment* increases the likelihood to "strongly disagree" with the statement that a university education is more important for a boy than a girl by 5 percent among Muslims, and by 3 percent among Christians.[7] This contrasts with the case of Kaduna where the size of the effect was larger for Christians than Muslims. *Gender* was significant at the 1 percent level in both models and carried a positive sign. Keeping all covariates at their mean levels, the analysis showed that compared to males, being female increases the likelihood to "strongly disagree" with the statement that a university education is more important for a boy than a girl by 26 percent among Muslims, and by 10 percent among Christians. This contrasts with the case of Kaduna where the size of the effect was larger among Christians than Muslims.

5.0. Conclusion

This study examined the effect of educational attainment on attitudes towards gender equality in the states of Kaduna and Edo, which are located in Nigeria's Northern and Southern Regions respectively. The regression results showed that education has a positive effect on support for gender equality in both states. A mechanism through which this happens is that education

[6] Tables 7 and 8 in the appendix report the marginal effects at the mean for models 6 and 7
[7] Tables 9 and 10 in the appendix report the marginal effects at the mean for models 7 and 8

exposes the individual to different ideas that challenge customs and beliefs that might be opposed to gender equality. Education also creates a conducive environment that allows for the questioning of these beliefs and customs. Being female was also found to increase the likelihood of supporting gender equality in both states, while Muslim self-identification reduced the likelihood of supporting gender equality only in Kaduna. When I broke down the data based on gender and religious affiliation and compared the subgroups across the two states, some patterns emerged: Although Muslims are less supportive of gender equality than Christians in the respective states, Muslims in Edo are more supportive of gender equality than both Christians and Muslims in Kaduna. Although males are less supportive of gender equality than females in the respective states, males in Edo are more supportive of gender equality than both females and males in Kaduna. This indicates that it would be misleading to lump respondents from the two states into the same category based on gender or religious affiliation because they differ considerably.

Women constitute half of Nigeria's population, and depriving them of educational opportunities is a big loss for the country. The contribution of women is crucial in fostering economic development, and education has the capacity to increase the size of their contribution. This is because educated women have a higher income earning potential than their uneducated counterparts, which in turn increases the share of their contribution to household income, and possibly improvements in the socioeconomic wellbeing of the household members. "Schooling always distinguishes individuals from the general mass of society, making possible the advancement of one person over others, not on the basis of inherited status but on the basis of personal achievement." (Ryan, 2006, 201). Moreover, education is crucial in addressing the problem of child marriage, especially in Northern Nigeria where the practice is prevalent (The Guardian, 2021; Mobolaji, Fatusi, and Adedini 2020; Amzat, 2020; Kaduna State Bureau of Statistics, 2015, 6). This is because educated women are more likely to delay marriage than their uneducated counterparts (Marphatia et al. 2020; Bates, Maselko, and Schuler 2007).

Disclosure statement

The author declares no conflict of interest.

Ethical approval

The survey project conducted in Nigeria was reviewed by the WZB Berlin Social Science Center Ethics Review Committee (Application No.: 2020/3/101). The National Health Research Ethics Committee of Nigeria (NHREC) also reviewed the project and granted approval.

References

Abidogun, J. 2007. "Western education's impact on Northern Igbo gender roles in Nsukka, Nigeria." *Africa Today* 54(1): 29–51. https://doi.org/10.2979/aft.2007.54.1.28

Abubakar, S. A. 1974. "The emirate-type of government in the Sokoto Caliphate." *Journal of the Historical Society of Nigeria* 7(2): 211–229. https://www.jstor.org/stable/pdf/41857009.pdf

Adisa, T. A., C. Mordi, R. Simpson, and B. Iwowo. 2021. "Social dominance, hypermasculinity, and career barriers in Nigeria." *Gender, Work & Organization* 28(1): 175–194. https://doi.org/10.1111/gwao.12537

Alexander, A. C., and C. Welzel. 2011. "Islam and patriarchy: How robust is Muslim support for patriarchal values?" *International Review of Sociology* 21(2): 249–276. https://doi.org/10.1080/03906701.2011.581801

Amzat, J. 2020. "Faith effect and voice on early marriage in a Nigerian state." *Sage Open* 10(2): 1–9. https://doi.org/10.1177/2158244020919513

Balk, D. 1997. "Defying gender norms in rural Bangladesh: A social demographic analysis." *Population Studies* 51(2): 153–172. https://doi.org/10.1080/0032472031000149886

Bates, L. M., J. Maselko, and S. R. Schuler. 2007. "Women's education and the timing of marriage and childbearing in the next generation: evidence from rural Bangladesh." *Studies in Family Planning*, 38(2): 101–112. https://doi.org/10.1111/j.1728-4465.2007.00121.x

BenYishay, A., R. Rotberg, J. Wells, Z. Lv, S. Goodman, L. Kovacevic, and D. Runfola. 2017. "Geocoding Afrobarometer Rounds 1–6: Methodology & Data Quality." AidData. http://geo.aiddata.org.

Boehnke, M. 2011. "Gender role attitudes around the globe: Egalitarian vs. traditional views." *Asian Journal of Social Science* 39(1): 57–74. https://doi.org/10.1163/156853111x554438

Bondarenko, M, D. Kerr, A. Sorichetta, A. Tatem, and Worldpop. 2020. "Census/projection-disaggregated gridded population datasets for 51 countries across sub-Saharan Africa in 2020 using building footprints." WorldPop, University of Southampton, *UK*. doi:10.5258/SOTON/WP00682

Chatard, A., and L. Selimbegovic. 2007. "The impact of higher education on egalitarian attitudes and values: Contextual and cultural determinants." *Social and Personality Psychology Compass* 1(1): 541-556. https://doi.org/10.1111/j.1751-9004.2007.00024.x

Diamond L. 1988. *Class, ethnicity and democracy in Nigeria: The failure of the first republic*. London: Macmillan.

Dinçer, M. A., N. Kaushal, and M. Grossman. 2014. "Women's education: Harbinger of another spring? Evidence from a natural experiment in Turkey." *World Development* 64: 243–258. https://doi.org/10.1016/j.worlddev.2014.06.010

Diwan, I., and I. Vartanova. 2017. "The effect of patriarchal culture on women's labor force participation." Economic Research Forum (ERF) Working Paper No. 1110. https://erf.org.eg/publications/the-effect-of-patriarchal-culture-on-womens-labor-force-participation/

Dotti Sani, G. M., and M. Quaranta. 2017. "The best is yet to come? Attitudes toward gender roles among adolescents in 36 countries." *Sex Roles* 77(1): 30–45. https://doi.org/10.1007/s11199-016-0698-7

Eidhamar, L.G. 2018. "My husband is my key to paradise': Attitudes of Muslims in Indonesia and Norway to spousal roles and wife-beating." *Islam and Christian-Muslim Relations* 29(2): 241–264. https://doi.org/10.1080/09596410.2017.1405636

Glas, S., and A. Alexander. 2020. "Explaining support for Muslim feminism in the Arab Middle East and North Africa." *Gender and Society* 34(3): 437–466. https://doi.org/10.1177/0891243220915494

Haerpfer, C., R. Inglehart, A. Moreno, C. Welzel, K. Kizilova, J. Diez-Medrano, M. Lagos, P. Norris, E. Ponarin, and B. Puranen. 2022. *World Values Survey: Round Seven - Country-Pooled Datafile Version 4.0*. Madrid, Spain & Vienna, Austria: JD Systems Institute & WVSA Secretariat.

Helleiner, G. K. 1966. *Peasant agriculture, government, and economic growth in Nigeria*. Illinois: Richard D. Irwin, Inc.

Inglehart, R., C. Haerpfer, A. Moreno, C. Welzel, K. Kizilova, J. Diez-Medrano, M. Lagos, P. Norris, E. Ponarin, and B. Puranen. 2014. *World Values Survey: Round Six - Country-Pooled Datafile Version*: Madrid: JD Systems Institute. https://www.worldvaluessurvey.org/WVSDocumentationWV6.jsp.

Kaduna State Bureau of Statistics. 2015. *Kaduna State general household survey report*. Kaduna: KDBS. https://kdbs.ng/app/uploads/2018/02/Kaduna-State-General-House-Report.pdf

Kane, E. W. 1995. "Education and beliefs about gender inequality." *Social Problems* 42(1), 74–90. https://doi.org/10.2307/3097006

Kirk-Greene, A. H. M. 1965. *The principles of native administration in Nigeria: Selected documents, 1900-1947*. London: Oxford University Press.

Kyoore, J. E., and I. Sulemana. 2019. "Do educational attainments influence attitudes toward gender equality in sub-Saharan Africa?" *Forum for Social Economics* 48(4): 311–333. https://doi.org/10.1080/07360932.2018.1509797

Levtov, R. G., G. Barker, M. Contreras-Urbina, B. Heilman, and R. Verma. 2014. "Pathways to gender-equitable men: Findings from the international men and gender equality survey in eight countries." *Men and Masculinities* 17(5): 467–501. https://doi.org/10.1177/1097184x14558234

Lussier, D. N., and M. S. Fish. 2016. Men, Muslims, and attitudes toward gender inequality. *Politics and Religion* 9(1): 29–60. https://doi.org/10.1017/s1755048315000826

Marphatia, A. A., N. M. Saville, G. S. Amable, D. S. Manandhar, M. Cortina-Borja, J. C. Wells, and A. M. Reid. 2020 "How much education is needed to delay women's age at marriage and first pregnancy?" *Frontiers in Public Health* 7(396): 1–17. https://doi.org/10.3389/fpubh.2019.00396

McDaniel, A. E. 2008. "Measuring gender egalitarianism: The attitudinal difference between men and women." *International Journal of Sociology* 30(1): 58–80. https://doi.org/10.2753/ijs0020-7659380103

Mensch, B. S., B. L. Ibrahim, S. M. Lee, and O. El-Gibaly. 2003. "Gender role attitudes among Egyptian adolescents." *Studies in family Planning* 34(1): 8–18. https://doi.org/10.1111/j.1728-4465.2003.00008.x

Mobolaji, J. W., A. O. Fatusi, and S. A. Adedini. 2020. "Ethnicity, religious affiliation and girl-child marriage: a cross-sectional study of nationally representative sample of female adolescents in Nigeria." *BMC Public Health* 20(1), 1–10. https://doi.org/10.1186/s12889-020-08714-5

Nigerian National Bureau of Statistics. 2020. *2019 poverty and inequality in Nigeria: Executive summar*y. Abuja: National Bureau of Statistics.

Nigerian National Bureau of Statistics. 2010. *The national literacy survey*. Abuja: National Bureau of Statistics.

Nigerian National Bureau of Statistics and UNICEF. 2017. *Multiple indicator cluster survey 2016-17, survey findings report*. Abuja: National Bureau of Statistics and United Nations Children's Fund.

Nmehielle, V. O. 2004. Sharia law in the Northern States of Nigeria: To implement or not to implement, the constitutionality is the question. *Human Rights Quarterly* 26(3): 730–759. https://doi.org/10.1353/hrq.2004.0039

Ogunsola, A. F. 1974. *Legislation and education Northern Nigeria.* Ibadan: Oxford University Press.

Okonkwo, E. A. 2013. "Attitude towards gender equality in South-Eastern Nigerian culture: Impact of gender and level of education." *Gender and Behavior* 11(2): 5579–5585.

Olarenwaju, O., and O. Awogbayila. 2021. "Traditional gender roles and marriage: A case study of residents in Maryland Lagos State, Nigeria." *Journal of Gender and Power* 15(1): 9–22

Para-Mallam, F. J. 2010. "Promoting gender equality in the context of Nigerian cultural and religious expression: Beyond increasing female access to education." *Journal of Comparative and International Education* 40(4): 459–477. https://doi.org/10.1080/03057925.2010.490370

Phinney, J. S. and J. Flores. 2002. "Unpackaging" acculturation: Aspects of acculturation as predictors of traditional sex role attitudes. *Journal of Cross-cultural Psychology* 22(4): 320–331. https://doi.org/10.1177/0022022102033003007

Ryan, P. 2006. "In my end is my beginning: Muslim and Christians traditions at cross-purposes in contemporary Nigeria." Chapter 8 in *Muslim-Christian encounters in Africa*. Leiden: Brill.

Seguino, S. 2010. "Help or hinderance? Religion's impact on gender inequality in attitudes and outcomes. *World Development* 39(8): 1308–1321. https://doi.org/10.1016/j.worlddev.2010.12.004

Shu, X. (2004). 'Education and gender egalitarianism: The case of China." *Sociology of Education*, 77(4), 311–336. https://doi.org/10.1177/003804070407700403

Siollun, M. 2021. *A short history of conquest and rule: What Britain did to Nigeria.* London: Hurst and Company.

Tatem, A. J., P. W. Gething, S. Bhatt, D. Weiss, and C. Pezzulo. 2013. "Pilot high resolution poverty maps." University of Southampton/Oxford.

The Guardian. 2021. "38% of girls in Kaduna LG marry before age 15." *The Guardian*, June 9. Available at: https://guardian.ng/news/38-of-girls-in-kaduna-lg-marry-before-age-15/ (Accessed December 24 2022)

United National Development Program. 2022. *Uncertain times, unsettled lives: Shaping our future in a transforming world* (Human Development Report 2021/2022). New York: United Nations Development Program. https://hdr.undp.org/content/human-development-report-2021-22

Zhang, Y., G. Kao, and E. Hannum 2007. "Do mothers in rural China practice gender equality in educational aspirations for their children?" *Comparative Education Review* 51(2): 131–157. https://doi.org/10.1086/512023

APPENDIX

Table 1: Marginal effects at the mean for model 3 – (Kaduna)

Education better for boys than girls$^{\phi}$	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
	(0)	(1)	(2)	(3)	(4)
Educational attainment	-0.091***	0.003	0.003**	0.02***	0.066***
	(0.01)	(0.004)	(0.001)	(0.004)	(0.007)
Gender	-0.251***	0.007	0.008***	0.056***	0.18***
	(0.029)	(0.01)	(0.003)	(0.012)	(0.02)
Religious affiliation	0.318***	-0.009	-0.01***	-0.071***	-0.229***
	(0.057)	(0.011)	(0.003)	(0.023)	(0.042)
Age	-0.004**	0.00	0.00	0.001***	0.003**
	(0.002)	(0.00)	(0.00)	(0.00)	(0.001)
Marital status	0.022	-0.001	-0.001	-0.005	-0.016
	(0.062)	(0.002)	(0.002)	(0.013)	(0.045)
Household income	-0.026**	0.001	0001*	0.006**	0.018*
	(0.013)	(0.001)	(0.0-0)	(0.002)	(0.01)
Poverty rate	0.05***	-0.014	-0.016**	-0.111***	-0.359***
	(0.128)	(0.02)	(0.008)	(0.042)	(0.074)

*Notes: Standard errors are in parentheses, ϕ is the dependent variable, and *** p<0.01, ** p<0.05, * p<0.10. The numbers below the response categories denote the ordinal values assigned to each of them.*

Table 2: Marginal effects at the mean for model 5 – Males (Kaduna)

Education better for boys than girls$^{\phi}$	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
	(0)	(1)	(2)	(3)	(4)
Educational attainment	-0.089***	0.007**	0.004**	0.024***	0.054***
	(0.015)	(0.003)	(0.002)	(0.006)	(0.009)
Religious affiliation	0.34***	-0.026**	-0.016**	-0.09***	-0.207***
	(0.062)	(0.011)	(0.006)	(0.029)	(0.036)
Age	-0.002	0.00	0.00	0.001	0.001
	(0.002)	(0.00)	(0.00)	(0.001)	(0.001)
Marital status	-0.078	0.006	0.004	0.021	0.047
	(0.049)	(0.004)	(0.002)	(0.014)	(0.031)
Household income	-0.018	0.001	0.001	0.005	0.011
	(0.024)	(0.002)	(0.001)	(0.006)	(0.015)
Poverty rate	0.671***	-0.052*	-0.033**	-0.178***	-0.409***
	(0.155)	(0.03)	(0.016)	(0.057)	(0.073)

*Notes: Standard errors are in parentheses, ϕ is the dependent variable, and *** p<0.01, ** p<0.05, * p<0.10. The numbers below the response categories denote the ordinal values assigned to each of them.*

Table 3: Marginal effects at the mean for model 6 – Females (Kaduna)

Education better for boys than girls$^{\phi}$	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
	(0)	(1)	(2)	(3)	(4)
Educational attainment	-0.09***	-0.001	0.002*	0.016***	0.073***
	(0.013)	(0.004)	(0.001)	(0.004)	(0.009)
Religious affiliation	0.29***	0.005	-0.006**	-0.053***	-0.236***
	(0.06)	(0.014)	(0.002)	(0.02)	(0.054)
Age	-0.005**	-0.00	0.00	0.001**	0.004**
	(0.002)	(0.00)	(0.00)	(0.00)	(0.002)
Marital status	0.111	0.002	-0.002	-0.02	-0.09
	(0.087)	(0.004)	(0.002)	(0.014)	(0.07)
Household income	-0.032	-0.001	0.001	0.006	0.026
	(0.021)	(0.001)	(0.001)	(0.004)	(0.017)
Poverty rate	0.367***	0.006	-0.007*	-0.067*	-0.298***
	(0.127)	(0.016)	(0.004)	(0.036)	(0.094)

*Notes: Standard errors are in parentheses, ϕ is the dependent variable, and *** p<0.01, ** p<0.05, * p<0.10. The numbers below the response categories denote the ordinal values assigned to each of them.*

Table 4: Marginal effects at the mean for model 7 – Muslims (Kaduna)

Education better for boys than girls$^{\phi}$	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
	(0)	(1)	(2)	(3)	(4)
Educational attainment	-0.086***	0.02***	0.007***	0.021***	0.038***
	(0.011)	(0.005)	(0.003)	(0.004)	(0.006)
Gender	-0.236***	0.056***	0.019***	0.057***	0.104***
	(0.038)	(0.014)	(0.007)	(0.012)	(0.021)
Age	-0.004*	0.001*	0.00	0.001**	0.002*
	(0.002)	(0.001)	(0.00)	(0.00)	(0.001)
Marital status	-0.017	0.004	0.001	0.004	0.007
	(0.063)	(0.015)	(0.005)	(0.015)	(0.028)
Household income	-0.005	0.001	0.00	0.001	0.002
	(0.019)	(0.004)	(0.00)	(0.004)	(0.008)
Poverty rate	0.587***	-0.138***	-0.048***	-0.142***	-0.259***
	(0.11)	(0.046)	(0.017)	(0.039)	(0.037)

*Notes: Standard errors are in parentheses, ϕ is the dependent variable, and *** p<0.01, ** p<0.05, * p<0.10. The numbers below the response categories denote the ordinal values assigned to each of them.*

Table 5: Marginal effects at the mean for model 8 – Christians (Kaduna)

Education better for boys than girls$^{\phi}$	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
	(0)	(1)	(2)	(3)	(4)
Educational attainment	-0.061***	-0.016***	-0.003**	-0.007	0.086***
	(0.017)	(0.002)	(0.001)	(0.004)	(0.013)
Gender	-0.167***	-0.043***	-0.007	-0.018	0.235***
	(0.037)	(0.011)	(0.004)	(0.014)	(0.037)
Age	-0.003	-0.001*	-0.00*	-0.00**	0.004
	(0.002)	(0.00)	(0.00)	(0.00)	(0.002)
Marital status	0.027	0.007	0.001	0.003	0.038
	(0.053)	(0.012)	(0.002)	(0.004)	(0.071)
Household income	-0.03**	-0.008***	-0.001	-0.003	0.042***
	(0.012)	(0.002)	(0.001)	(0.002)	(0.013)
Poverty rate	0.079	0.02	0.003	0.009	-0.112
	(0.221)	(0.057)	(0.009)	(0.023)	(0.309)

*Notes: Standard errors are in parentheses, ϕ is the dependent variable, and *** p<0.01, ** p<0.05, * p<0.10. The numbers below the response categories denote the ordinal values assigned to each of them.*

Table 6: Marginal effects at the mean for model 3 – (Edo)

Education better for boys than girls$^{\phi}$	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
	(0)	(1)	(2)	(3)	(4)
Educational attainment	-0.015***	-0.006***	-0.004***	-0.006***	0.031***
	(0.003)	(0.001)	(0.001)	(0.002)	(0.006)
Gender	-0.058***	-0.022***	-0.016***	-0.025***	0.121***
	(0.015)	(0.005)	(0.003)	(0.005)	(0.024)
Religious affiliation	0.018	0.007	0.005	0.008	-0.038
	(0.026)	(0.01)	(0.008)	(0.011)	(0.056)
Age	-0.00	-0.00	-0.00	-0.00	0.00
	(0.001)	(0.00)	(0.00)	(0.00)	(0.001)
Marital status	-0.038**	-0.015***	-0.011**	-0.016***	0.079***
	(0.015)	(0.005)	(0.005)	(0.006)	(0.03)
Household income	-0.01***	-0.004*	-0.003	-0.004*	0.02*
	(0.005)	(0.002)	(0.02)	(0.002)	(0.011)
Poverty rate	-0.049	-0.019	-0.014	-0.021	0.104
	(0.087)	(0.033)	(0.026)	(0.038)	(0.183)

*Notes: Standard errors are in parentheses, ϕ is the dependent variable, and *** p<0.01, ** p<0.05, * p<0.10. The numbers below the response categories denote the ordinal values assigned to each of them.*

Table 7: Marginal effects at the mean for model 5 – Males (Edo)

Education better for boys than girls$^{\phi}$	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
	(0)	(1)	(2)	(3)	(4)
Educational attainment	-0.015***	-0.004***	-0.003***	-0.004***	0.026***
	(0.004)	(0.001)	(0.001)	(0.001)	(0.006)
Religious affiliation	0.058	0.016	0.01	0.014	-0.099
	(0.037)	(0.011)	(0.007)	(0.01)	(0.063)
Age	-0.001*	-0.00	-0.00*	-0.00*	0.002*
	(0.001)	(0.00)	(0.00)	(0.00)	(0.001)
Marital status	-0.052*	-0.014*	-0.009*	-0.013*	0.088*
	(0.029)	(0.007)	(0.005)	(0.008)	(0.048)
Household income	-0.002	-0.001	-0.00	-0.001	0.004
	(0.01)	(0.003)	(0.002)	(0.002)	(0.016)
Poverty rate	0.145	0.039	0.026	0.035	-0.245
	(0.126)	(0.036)	(0.023)	(0.032)	(0.216)

*Notes: Standard errors are in parentheses, ϕ is the dependent variable, and *** p<0.01, ** p<0.05, * p<0.10. The numbers below the response categories denote the ordinal values assigned to each of them.*

Table 8: Marginal effects at the mean for model 6 – Females (Edo)

Education better for boys than girls$^{\phi}$	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
	(0)	(1)	(2)	(3)	(4)
Educational attainment	-0.012***	-0.007**	-0.006**	-0.009**	0.034***
	(0.004)	(0.003)	(0.002)	(0.003)	(0.012)
Religious affiliation	-0.009	-0.005	-0.004	-0.006	0.024
	(0.021)	(0.011)	(0.008)	(0.014)	(0.054)
Age	0.00	0.00	0.00	0.00	-0.001
	(0.001)	(0.00)	(0.00)	(0.001)	(0.001)
Marital status	-0.024**	-0.014**	-0.011	-0.018*	0.066*
	(0.012)	(0.007)	(0.007)	(0.009)	(0.034)
Household income	-0.012**	-0.007**	-0.005**	-0.009**	0.033**
	(0.005)	(0.003)	(0.003)	(0.003)	(0.013)
Poverty rate	-0.128**	-0.071**	-0.057	-0.093*	0.349*
	(0.063)	(0.035)	(0.039)	(0.053)	(0.187)

*Notes: Standard errors are in parentheses, ϕ is the dependent variable, and *** p<0.01, ** p<0.05, * p<0.10. The numbers below the response categories denote the ordinal values assigned to each of them.*

Table 9: Marginal effects at the mean for model 7 – Muslims (Edo)

Education better for boys than girls$^{\phi}$	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
	(0)	(1)	(2)	(3)	(4)
Educational attainment	-0.033*	-0.009**	-0.004	-0.004	0.049*
	(0.02)	(0.004)	(0.004)	(0.002)	(0.028)
Gender	-0.175***	-0.046**	-0.021	-0.02*	0.261***
	(0.044)	(0.022)	(0.014)	(0.011)	(0.079)
Age	-0.003	-0.001	-0.00	-0.00	0.005
	(0.003)	(0.001)	(0.001)	(0.00)	(0.005)
Marital status	-0.05	-0.013	-0.006	-0.006	0.075
	(0.098)	(0.023)	(0.01)	(0.011)	(0.14)
Household income	-0.007	-0.002	-0.001	-0.001	0.011
	(0.017)	(0.005)	(0.002)	(0.002)	(0.026)
Poverty rate	-0.099	-0.026	-0.012	-0.011	0.149
	(0.296)	(0.076)	(0.037)	(0.034)	(0.441)

*Notes: Standard errors are in parentheses, ϕ is the dependent variable, and *** p<0.01, ** p<0.05, * p<0.10. The numbers below the response categories denote the ordinal values assigned to each of them.*

Table 10: Marginal effects at the mean for model 8 – Christians (Edo)

Education better for boys than girls$^{\phi}$	**Strongly agree**	**Somewhat agree**	**Neither agree nor disagree**	**Somewhat disagree**	**Strongly disagree**
	(0)	**(1)**	**(2)**	**(3)**	**(4)**
Educational attainment	-0.013***	-0.006***	-0.004***	-0.007***	0.03***
	(0.003)	(0.001)	(0.001)	(0.002)	(0.006)
Gender	-0.046***	-0.019***	-0.015***	-0.023***	0.104***
	(0.013)	(0.005)	(0.003)	(0.005)	(0.024)
Age	0.00	0.00	0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.001)
Marital status	-0.036**	-0.015***	-0.012**	-0.018***	0.081***
	(0.015)	(0.006)	(0.005)	(0.006)	(0.031)
Household income	-0.01*	-0.004*	-0.003	-0.005*	0.022*
	(0.006)	(0.002)	(0.002)	(0.003)	(0.012)
Poverty rate	-0.041	-0.017	-0.013	-0.021	0.092
	(0.083)	(0.034)	(0.028)	(0.043)	(0.189)

*Notes: Standard errors are in parentheses, ϕ is the dependent variable, and *** p<0.01, ** p<0.05, * p<0.10. The numbers below the response categories denote the ordinal values assigned to each of them.*

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