

Intergenerational Transmission of Education, Ethnicity and Historical African Stratification Systems

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Abstract: This paper compares intergenerational persistence in education between ethnic groups based on their historical class stratification systems. Our aim is to ascertain whether differences in type of class stratification (rigid or fluid) for ethnic groups from the pre-independence period has implications for intergenerational transmission of education in contemporary Africa. The paper provides some stylized facts on intergeneration persistence in Africa and historical societies. Results from a social interaction model reveals persistence of historical rigidities in three of the six countries with the colonial and the immediate post-independence period playing a critical role in evolution of persistence within these societies.

Keywords: Intergenerational Mobility, Education, Ethnicity, Pre-colonial period, Colonial period, Africa

JEL Classification: C21, I24, J62, N17

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1 Introduction

One of the fundamental topics researched by sociologists and economists over the past few decades is the persistence in social status over successive generations. Social stratification can occur across various lines including age, gender, ethnicity and class. There is evidence that social stratification along class lines in modern Africa exhibits characteristics of what can be seen as pre-colonial African class structures, with the development of new ones during colonialism and in the post-colonial period (Iliffe, 1981; Diamond, 1987; Nafziger, 1988; Thomson, 2010). This leads to the question of whether within ethnic group class differences observed from the pre-colonial African society still have implications for mobility almost a hundred years later and if there are differences between the persistence within these groups in the countries they found themselves in after Africa was partitioned.

Characteristics of pre-colonial African culture and way of living have persisted over time and have been shown to be relevant in understanding various aspects of modern African society (Gakou, 1987; Michalopoulos and Papaioannou, 2013). In particular, it has been shown by Englebert (2000); Gennaioli and Rainer (2007) and Michalopoulos and Papaioannou (2013) that there is an association between the pre-colonial centralization of the ethnic institutions which existed in a country and contemporary development in Africa. The underlying notion behind the transmission of pre-colonial traits is the use of traditional system which were already in existence to rule the territories during the colonial era. Thus, the nature of already existing pre-colonial ethnic institution was important and for the centralized tribes, it was easier to set up colonial administrative units as opposed to those fragmented tribes. When applied to intergenerational mobility, Alesina et al. (2019) find no differences in persistence between successive generations when pre-colonial centralisation is taken into account. I build on this work by focusing on the historic class stratification systems in the African societies, as captured by Murdock (1967)¹, which reveals the absence or presence of opportunities for mobility in these societies at that time, and examine whether there are linkages to patterns in mobility for contemporary Africa.

The historical social stratification systems can be linked to mobility in contemporary Africa through uneven distribution of opportunities for progression, via education or employment in administrative offices, during the colonial period and which were by and large determined by status. This is based on existing literature which shows that during the colonial period, by and large, the main beneficiaries of opportunities were those with higher status in the society as opposed to the peasantry (Nafziger, 1988). As such, they had easier access to education and occupations placing them in a more advantaged position to lead during the independence period, and the status may have persisted in the post-independence period. I situate my argument within the stratification theory of Max Weber which provides a multi-

¹The updated and digitalized version of the ethnographic atlas is available at [Murdock et al. \(2010\)](#)

dimensional approach and recognises social status as a key element. By including countries which had different colonial administrators, I provide evidence of different trajectory that developed in African societies from the pre-colonial period. It is particularly important to include countries with different colonial origin, as the partition of Africa was done without regard to the type of societies within the borders and hence the trajectories of how these societies have evolved can to an extent be viewed as a natural experiment.

I broadly utilize the concept of the ‘ethclass’ introduced by [Gordon \(1961\)](#) to motivate the analysis of intra-group mobility. This analysis focuses on an individual's opportunity set at the intersection of ethnic group and class and is an ideal methodology to be used in multi-ethnic societies which are also stratified by class differences ([Marger, 1978](#)). This study is especially relevant for Africa for which ethnicity is a salient factor despite increased inequalities which can potentially lead to class consciousness gaining ground ([Wallerstein, 1973](#)). I utilize the theory of social capital put forward by [Bourdieu \(1986\)](#) and applied to networks by [Lin \(2008\)](#) to explain how status can carry on across generations. The analysis uses within country mobility to trace the differences in persistence between ethnic groups based on the historical stratification system that existed in that society as a means of highlighting the extent of historical persistence in Africa.

To conduct the analysis, ethnic groups are classified based on historical ethnographic data into five main categories. They are classified as either elite, dual, complex, having wealth distinctions or absence of class differences among freemen.² I group these into two types of societies based on my interpretation of the classifications: Those in which personal efforts could lead to differences in social status, fluid societies (Absence among freemen, wealth distinctions and complex societies), and those where hereditary factors played a major role in status, rigid societies (Elite and Dual societies) ([Murdock, 1967](#); [Murdock et al., 2010](#)). Because there are more ethnic groups identified in the surveys than was captured in the ethnographic data, I include these in a separate category, other ethnic groups, and also differentiate those of European origin from the local groups.³ The main objective of this paper is to examine, for Africa, differences in intergenerational persistence of education between ethnic groups based on their historical class stratification systems in Africa.

To attain the objective, I first use the Global Database on Intergenerational Mobility (GDIM) from the World Bank to observe patterns between intergenerational education persistence in African countries and historical class systems based on the dominant type of society in each country. I then estimate a social interaction model using cross-sectional household survey data for Ghana, Guinea, Madagascar, Malawi, Niger and Nigeria. The model is estimated individually for each country and includes fixed effects for ethnic group,

²A detailed discussion of the class stratifications as reported by [Murdock \(1967\)](#) is presented in section 4

³[Ranger \(1985\)](#) and [Thomson \(2010\)](#) discuss the creation of new ethnic groups in African society during the colonial period.

region and religion. To complement the regression results, standard mobility and transition matrices are also estimated. I find significant differences in intergenerational persistence based on the historical class stratification system in which the various ethnic groups fall into in three of the six countries. These results are robust to the different controls introduced in the model. I find that the regions of parental education in which these differences are distinguishable are distinct based on colonial origin. For the anglophone countries, the difference in persistence is at no or low levels of parental education indicating that dual groups may have higher levels of social capital which increases the education opportunities of their children compared to similar households with similar parental education levels in the other historical groups. For the francophone countries, the difference is at high levels of education and the main driving force was the disparity in education attainment of children between the classifications.

This study contributes to different strands of the existing literature. The main contribution of the paper is the demonstration that pre-colonial and colonial African societies class stratification systems have led to differences in within-country intergenerational mobility between ethnic groups and there are similarities in pattern based on colonial origin. Firstly, by discussing historical African societies and the link to modern society, it is related to the literature which examines the effect of past significant episodes, such as slavery and colonialism, on contemporary societies (Englebert, 2000; Acemoglu et al., 2001; Gennaioli and Rainer, 2007; Nunn and Wantchekon, 2011; Michalopoulos and Papaioannou, 2013, 2016; Archibong, 2018). Englebert (2000) argues that state capacity and growth can be explained by the interaction of post-colonial state institutions and pre-existing traditional institutions. Acemoglu et al. (2001) link colonization policies to differences in institutional development and growth while Gennaioli and Rainer (2007); Michalopoulos and Papaioannou (2013) and Michalopoulos and Papaioannou (2016) study how pre-colonial centralization and the scramble for Africa relate to economic development in Africa. Nunn and Wantchekon (2011) provides a causal framework through which the slave trade led to the origin of mistrust in Africa while (Archibong, 2018) argues that the interaction between traditional leaders and colonial officers during the colonial period is key to understanding persistent inequality in Nigeria.

The contribution of this paper is also in line with similar work which show persistence of historical benefits across multiple family generations (Lindahl et al., 2015; Clark, 2012; Adermon et al., 2016). By focusing on intra group mobility and historical persistence, this study is related to work done in India by various researchers on different mobility levels for the different castes and religions in India whose existence pre-dates the colonial period of the nation (Azam and Bhatt, 2015; Jalan and Murgai, 2008; Asher et al., 2018; Hnatkovska, Viktoria and Lahiri, Amartya and Paul, Sourabh B, 2013). Intergenerational mobility which use phenotypic characteristics as a measure of ethnic grouping is the focus of research done in the United States by Chetty et al. (2018) and for South Africa by Nimubona and Vencat-

achellum (2007) and Kwenda et al. (2015). I add to this literature by examining intra-group mobility using ethnic group as identified using the social and cultural criteria. Our discussion which also alludes to class and intergenerational mobility also relates to existing studies by Savage et al. (2013) for Britain and Dalle (2018) for Argentina.

The rest of this paper is organized as follows: Section 1.1, I provide a discussion of African social groups and changes in the class structure from the pre-colonial to post-colonial period. In section 2, I provide a brief discussion on the interaction of ethnicity and class and set up the working hypothesis for this article. The methodology and data are presented in 3 while section 4 presents the study results. Section 5 provides a summary of our findings and concludes.

1.1 Historical Background - Evolution of African Societies and Social Class structure

Social stratification systems have been a mainstay around which societies have developed over time. They have usually been discussed in the context of class and in this regard, Karl Marx is considered as the pioneer of its development. Karl Marx, as cited in Saunders (2006), centres his work on the exploitation of one group of people by another group. points to the existence of two classes in a capitalist system, the bourgeoisie (who own the factors of production) and the proletariat (who are the masses and provide the labour). The elite exploit the masses and earn surplus wealth and this continues until the working class revolt and take over the factors of production and equality results in the society. A key aspect of Marx's work is that he ignores the issue of how other variables such as gender, ethnicity and social status interact with issues of class and his theoretical set up has been criticized as not being readily applicable to African society by, amongst others, Gakou (1987) and Thomson (2010).

The work by Max Weber provides a more suitable framework of understanding social stratification in Africa. Weber conceptualises political power, social status and class power as the basic dimensions of social stratification. Weber recognises that these dimensions are not necessarily synonymous and hence an individual may have a significant level of social status based on ethnic group belonging but may not necessarily be wealthy (class power). Weberian stratification theory is therefore multi-dimensional, unlike Marxist theory, and this enables it to analyse both class and non-class bases of inequality (Saunders, 2006; Scott, 2014).⁴ I employ the Weberian framework to intergenerational mobility to understand how class differences may be perpetuated within ethnic groups over successive generations through persistence of status across generations. In essence, I discuss social stratification following

⁴Saunders (2006) provides a comprehensive review of Marx versus Weber theories of social stratification

the definition of [Scott \(2014\)](#), who defines it as the internal partitioning of a society into a ‘hierarchy of distinct social groups each with different life chances and style of life’.

1.1.1 Pre-colonial Africa

A body of work has developed on the type of society that existed in pre-colonial Africa. This work developed across several decades from as early as the 1950s and is driven by the notion that by understanding the history of the African society, we can contextualize the current challenges faced and suggest appropriate remedies for the future. A summary of some of the literature in this field is provided by [Gakou \(1987\)](#). Using the village community as the basic organisation unit, the general agreement is that African societies had progressed beyond primitive communism and moved into a class society, with factors such as slavery, payment of tributes to chiefs and intercontinental trade playing various roles. Some researchers, such as Suret-Canale, cited in [Gakou \(1987\)](#), situate the analysis following the Asiatic mode of production outlined by Marx and Engels and stress the importance of geographic conditions on the development of class societies, with savanna regions which were agricultural in nature lending themselves more to social conflict than other areas. Other authors argue against the use of the Asiatic mode of production and define an African mode of production that takes into account factors specific to Africa, for example the communal ownership of land ([Gakou, 1987](#); [Coquery-Vidrovitch, 2010](#); [Thomson, 2010](#)).⁵ A distinction arises when discussing pre-colonial ethnic groups which were centralized or territorial organizations from those which were more or less tribal and lineage structures based on families. The so called ‘state societies’ were more organised and the trade network was more advanced and this would lead to development of social classes which were more apparent as opposed to stateless societies ([Gakou, 1987](#); [Coquery-Vidrovitch, 2010](#)). [Michalopoulos and Papaioannou \(2013\)](#); [Gennaioli and Rainer \(2007\)](#); [Englebert \(2000\)](#) provide a discussion on pre-colonial African centralization versus decentralization and outline a basic structure of how the society operated under those conditions.

Discussions on the mode of production leads to the question of what type of social stratification was in existence in pre-colonial Africa. [Nafziger \(1988\)](#) positions that class and major wealth and power inequalities existed in Africa before colonial rule. For example, in pre-colonial Rwanda, the Twa were ranked lower and the powerful and wealthy elites in the society used oppression and terror in their dealings with them when necessary. Others point to the ownership of land communally as key to understanding pre-colonial Africa. [Ilfie and John \(1987\)](#) distinguishes between the structural meaning of being considered as ‘poor’ in

⁵A discussion of the African mode of production which is based on a patriarchal-communal economy and exclusive dominance of one group in long distance trade, as opposed to Asiatic mode of production which supposes villages based on collective production and bound to a state/ despot who exploits the community can be found in the work of ([Coquery-Vidrovitch, 2010](#))

precolonial Africa as compared to post-colonial Africa. He argues that in pre-colonial Africa, only those without access to labour to work the land could be considered as the very poor but with the advent of colonialism, this changed to include even those who could not access land. His work also highlights the role of occupation as a determinant of status in precolonial African society, and identifies social stratification in existence even amongst slaves. This is in line with work of [Murdock \(1967\)](#); [Nafziger \(1988\)](#); [Wright \(1999\)](#) and [Thomson \(2010\)](#) who show that different class structures were in existence during this period. These class structures were closely related to the social status an individual was accorded and as stated above, sometimes linked to occupation,⁶ and also included the beneficiaries from the slave and intercontinental trade that existed then. Using classifications from [Thomson \(2010\)](#), I identify three social classes from Pre-colonial Africa: peasants, commercial bourgeoisie (those who benefited from intercontinental trade), and the traditional rulers. We posit that more prestigious occupations like cattle ownership and farming would be located between peasants and commercial bourgeoisie. [Nafziger \(1988\)](#) argues that it was easier for the elites in the pre-colonial days to transmit their wealth, opportunity, power and privilege in those times to their children in the post independence African countries and this arguments holds fast based on [Murdock \(1967\)](#) classification of the pre-colonial African society.

1.1.2 The colonial period

The colonial period radically transformed African society. [Nnoli \(1998\)](#) notes the major changes in Africa which included the setting up of new institutions and the formal introduction of capitalism. The introduction of education and formal jobs in the colonial administration also led to the emergence of new social classes in Africa during this period. However, a level of continuity in terms of the social stratification system from the precolonial period exists when we look at which African were able to access new opportunities that emerged. The literature shows that the main beneficiaries during the colonial administration were those who were within the periphery of power, or in the ‘upper’ classes during pre-colonial times. [Nafziger \(1988\)](#) notes that the main recipients of the Western education and training essential for positions in the administrations, commerce and foreign firms came from the families that had higher status or incomes, although there were some exceptions who originated from humble backgrounds. In this way, the colonial period amplified existing inequalities and class divisions which originated in the pre-colonial period. These inequalities would then continue into the postcolonial period.

⁶[Longman \(2009\)](#) discusses traditional occupation distribution amongst the Ruanda and Rundi in precolonial times. Traditionally, there was strict division of labour along ethnic lines. The Tutsi raised livestock which was considered to be more prestigious, the Hutu were farmers and the Twa were the hunter gathers. In practice, the allocation of occupation was varied with some Tutsi farming and some Hutu raising livestock but attached status to the role remained with cattle ownership being an important element defining social class.

I classify, using Thomson (2010) definitions, the social groups in Africa during this period as the peasants, emerging proletariat (those in civil service occupations within the colonial administration), emerging petite (minor owners of productive property)⁷ and bureaucratic bourgeoisies (educated) and the traditional leaders. During this period, the commercial bourgeoisie reduced in size due to the redistribution of land and trading activities to the new colonial settlers and the importation of Indians to perform the role of trading (Nafziger, 1988). Indeed Kitching, as cited in Iliffe (1981) postulates that in Kenya, the so called 'differential access to western education and thus to better-paid jobs enabled a small minority, the nascent petite bourgeoisie, to emerge in the late 1920s and 1930s by investing their wage-earnings in agriculture'. By collaborating and cooperating with the colonial administration system, traditional rulers and the ruling classes were able to maintain their higher class status. Nafziger (1988) discusses how a parasitic landlord class was created by the Buganda Agreement of 1900 where the British gave out half of the land to the entire hierarchy from king to chiefs and this ruling class became sub-imperialists within the Uganda colony.

Education opportunities during the colonial period were mainly meant for the provision of skills needed for the colonial administration and some parts of the society, for example women, were excluded from accessing it. Class comes into play as the British and French provided excellent education for children of elites (especially chiefs and aristocrats). For example, in Ghana in 1953, almost all of the families accessing education came from families where the annual income was over 250 pounds in a country where the average annual income was below 100 pounds (Nafziger, 1988). This meant that education opportunities were mainly the reserve of those from wealthier families and peasant families would have been disadvantaged in perpetuity had missionaries not been allowed to undertake mass education. Missionaries played a key role in the development of human capital and education system across the globe and in Africa (Acemoglu et al., 2014). Woodberry (2004) and Gallego and Woodberry (2010) give the main reason for mass education as the desire for natives to read the Bible and shows how access to education differed between Protestant Missionaries and Catholics and also between British (mass education available for all) and French colonies (limited to the elite class). In Nigeria, almost all students were enrolled in Mission schools in 1942 and they also took in those from humble backgrounds. In this way, missionary activity contributed to the emergence of the educated class and played a significant role in upward mobility (Nafziger, 1988).

⁷Kitching (1980) provides a good analysis of how the savings from those working in the colonial administrations were used to purchase property in rural areas in Kenya leading to the emergence of a new class, the petite bourgeoisie

1.1.3 The Post Colonial period

Post colonial Africa has been integrated into the capitalist system though it still maintains some unique characteristics, mainly to do with the ownership of land which in some cases is still communally owned. The post-independence African society is characterized by a fragmented class structures with new classes emerging after colonialism. In addition to the same classes from Pre-colonial and colonial Africa, new classes emerged including the informal sector bourgeoisie, as well as those broadly classified as the national bourgeoisie (this includes the military, bureaucratic and academic groups) and international bourgeoisie (Thomson, 2010). In essence, what we see is that some pre-colonial groups in Africa have persisted to modern day with the addition of new classes as each 'shock' to the African society has occurred. There are very close interlinkage among the ruling class with those who hold political power frequently being able to increase their wealth and economic power leading to a nexus between the commercial and bureaucratic bourgeoisie. Indeed, Markovitz (1977) and Curtin et. al (1978) as cited in Nafziger (1988) also showed close ties between Nigerian military rulers and the Northern traditional aristocracy.

The interaction with the colonial administration is key to understanding the emergence of new classes in Africa and how the class system was maintained in the post-colonial era. Archibong (2018) documents how development in Nigeria differs based on how cooperative the traditional leaders were with the colonial administrators. She finds that in areas where there was resistance from the traditional rulers, there is poorer infrastructure than in those which were more cooperative. In the period leading to independence, policies were relaxed by the colonial administrators which enabled the African ruling elite to live in privilege similar to the colonialists and settlers. This elite, which included the newly educated groups, led the independence movement and occupied top position in the new states that were formed. The African ruling class in both rural and urban areas has used their accumulated advantages of wealth and power to reproduce the class standing in subsequent generations through human and physical capital investments (Nafziger, 1988). Gore (1994) provides a review of literature on social exclusion in the post colonial period and cites Elliot (1975) who discusses how upward mobility selection after independence is biased in favour of selected groups and their succeeding generations. He also discusses the finding of Hazelwood (1989) that family background is an important variable affecting probability of attaining education qualification, even when access to education was provided in post colonial Africa. As noted by Bates et al. (1972), education has been pivotal to the development of new stratifications in Africa.

2 A Congruence of Ethnicity and Class

One of the earliest works on ethnicity and class was from [Gordon \(1961\)](#). He develops a theory of the 'ethclass' which refers to societal stratification based on the intersection of the horizontal stratification of class and vertical stratification of ethnicity. In this case, Gordon discusses how belonging to an ethnic group and class influences the lifestyle, behaviour and as can be extended for our case, the opportunity set from networking that are available to an individual. While individuals still identify with other member of similar ethnic heritage, they associate more closely to individuals who share the same class and background, in this way affecting their network based opportunities. He argues that this is the best unit of analysis for understanding participation of individuals in American society, and I postulate that this can be extended to Africa where ethnicity remains a salient feature. As noted by [Bates \(1970\)](#), ethnic membership in Africa is one of the basic structures around which social and political activity are organized, though ethnicity needs an intervening variable such as class (or region of residence/ organizational power) to become a significant variable.

This work is complemented by [Horowitz \(1985\)](#) who in his formative work on ethnicity develops a framework showing how ethnic groups and class coincide. In societies where ethnic group belonging and class coincide, he refers to these as ranked society and extends his analysis to the type of conflict that results from this. In ranked societies, conflict that ensues aims at social transformation. Alternatively, where social class cuts across ethnic groups (unranked societies), conflict with the aim of secession usually results. In particular, he notes that the parallel ethnic groups usually originate from incipient whole societies and may have been autonomous whole states. Further research shows that in ranked societies, because class coincides with ethnic belonging, ethnic politics are more likely to reformist and based on equitable redistribution of resources amongst, while in unranked societies, ethnic identity comes to the fore as a political mobilisation tool ([Gisselquist, 2013](#)). Ranked and unranked societies also have different implications for mobility as discussed by [Blanton et al. \(2001\)](#), and is a key distinguishing factor for British and French colonial administrations. In unranked societies with high levels of inequalities between the different classes, [Esteban and Ray \(2008\)](#) show that there is an inherent bias towards ethnic conflict rather than class conflict. The elite prefer financing of ethnic conflict to the alternative of class unrest while the poor, in the absence of finances for class based violence, provide the labour for the unrest as a means of capturing resources.

It is important to underscore reasons for analysis from an ethnic group perspective, rather than purely class, for Africa. Ethnicity in Africa has evolved from being considered as an objective phenomena (implying differences in culture) in pre-colonial days to being based on consciousness and forming a base for ethnic processes in colonial and post-colonial Africa ([Jerman, 2003](#)). In pre-colonial days, ethnic identity was more fluid and could change based

on marriage, change of language or change in social status (Salamone, 1975; Wright, 1999).⁸ That the colonial period led to increased ethnic consciousness and the consolidation of ethnic group membership as an important means of identity has been agreed on by numerous scholars (Iliffe, 1979; Ranger, 1985; Jerman, 2003; Thomson, 2010). During the colonial period, ethnicity became a tool to access resources from the colonial state and this has continued in present day. This instrumentalist perspective is one of the main reasons for the salience of ethnicity for Africa and has been identified as a key barrier to 'nation' building and development (Bates, 1970; Jean-François, 1993; Welsh, 1996; Easterly and Levine, 1997). With reference to the constructivist proposition of fluidity of group boundaries, it can be argued that ethnic identity is stable over time and has been solidified in the post-colonial period, and ethnic groups have found ways of distinguishing between groups through the use of physical traits or names which are unique to the groups and it has been institutionalized in some African countries by the inclusion of ethnic origin on identification documents. Caselli and Coleman (2013) further provide a formal theory of why ethnicity is a rational basis for coalition building (as a boundary enforcement device to limit access to or control of resources) especially in multi-ethnic societies, which is applicable for almost all African countries. Therefore, I analyse within ethnic group mobility rather than at a societal level, though it can be said that if the salience of ethnicity reduces with increased development (in line with modernist theory), then perhaps pure class struggles will gain prominence for Africa.

Esteban and Ray (2011) and Esteban and Ray (2008) develop a model which examines the relationship between within and across ethnic group inequality and conflict. A key aspect is the composition of ethnic societies along class lines. They use internal ethnic group class stratifications as the basis for explaining the synergies of ethnic conflict. Horowitz (1985) also notes that unranked societies are usually also internally stratified, with differing degrees of internal group mobility. This is the underlying basis of this research. I examine whether Pre-colonial ethnic stratification have implications for intra group mobility in contemporary Africa utilising the concept of the 'ethclass'. From the literature, two mechanisms can be selected through which class and parental socio-economic status affects intergenerational mobility.

The first mechanism is that parental class affects children's outcome through relative risk aversion model developed by Breen and Goldthorpe (1997). The model was developed to explain the persistence of class differentials over time even in the face of increased education attainment levels. The central mechanism is that young people and their families have as their goal the attainment of a level of education that will allow them to attain a class position at least as good as for their family of origin (Breen and Yaish, 2006). This model represents children and families acting in a subjectively rational manner and explains class differentials

⁸Wright (1999) finds evidence of individual class identification among the Gambian people in pre-colonial times. He discusses how an upward change of class led to a change in ethnicity from Mandinka to Soninke.

as a consequence of secondary effects i.e. choices made by families in the course of their careers within the education system (Breen and Goldthorpe, 1997). Applied to the African case, this model would mean that families weigh the costs, risks and returns of pursuing higher education and for children from poor backgrounds, the costs may limit their choices extensively while for working class families, their education strategy would be to ensure their children acquire a position similar to their class.

The second mechanism postulates that children's education attainment is influenced by parents and their ethnic group and class belonging through the transmission of social capital. Social capital refers to social connections from which an individual can potentially access support for education or job advancement. Accordingly, differences in networks and their embedded resources leads to disparities in quantity and quality of social capital, and people from lower class families tend to have less of it than those from middle or upper class (Stanton-Salazar and Dornbusch, 1995; Lin, 2008).⁹ There are also differences in the types of ties within ethnic groups, namely binding, bonding and 'belonging', and these have implications for social capital. The use of parental social connections to affect life chances of their children is therefore arguably one of the main channels through which inequality of opportunity is maintained in the labour market (Dardanoni et al., 2006). When applied to this research, it implies that even within ethnic groups which are considered to be dominant, inequalities would persist if the individuals interact with and have socially binding ties with those with similar levels of embedded resources.

While we are not able to disentangle between the direct effects of either mechanisms, the goal and contribution of this paper is to assess the relationship between pre-colonial ethnic stratification and intergenerational mobility in Africa and I develop my hypothesis along these lines. I first present the counterfactual proposition based on arguments of how Africa would have developed sans the colonial period as discussed by Simensen (1978) and Horowitz (1985). Our counterfactual hypothesis is intuitive and based on the proposition that African societies would have evolved into homogenous whole states, and I hypothesize that rigid societies would have had higher levels of persistence. In comparison, societies characterised as fluid would have had lower levels of persistence though some rigidities would have developed, in line with the notion that as societies get bigger, then class structures become more apparent. Our hypothesis is also framed within the observed peculiarities of pre-colonial African societies.¹⁰

However, Africa did go through the colonial period and the effects were heterogeneous, as discussed by Acemoglu et al. (2001), and the objectives are developed taking this into account. Accordingly, the objective of this article is to examine whether there are differences in

⁹The criteria under which social capital is important for mobility is discussed further in Stanton-Salazar and Dornbusch (1995), Lin (2008) also proposes a social resource theory

¹⁰ Iliffe and John (1987) provides an insightful analysis of pre-colonial Africa

intergenerational persistence in education between ethnic groups based on their pre-colonial class stratification systems in Africa. In the course of the analysis, I attempt to identify the factors that may be driving the differences in the intra-group mobility.

3 Data and Methods

3.1 Historical Ethnic classification

Information from the Ethnographic Atlas written produced by [Murdock \(1967\)](#) is used to identify the class systems that existed from the pre-colonial to colonial period in Africa. Because there were no nation states in existence during that period, the ethnographic atlas captures the class systems within the ethnic groups which were representative of African states in that period. Murdock collected information from 1270 ethnicities worldwide, of which 834 were in Africa ([Murdock, 1967](#); [Gennaioli and Rainer, 2007](#); [Michalopoulos and Papaioannou, 2013](#)). Using a wide variety of sources, he recorded the class stratification systems in 571 African societies and measured it as the type and level of class differentiation in existence within the ethnic group, excluding the purely political and religious statuses. He categorised them into five classes, namely, elite (E), dual (D), complex (C), wealth distinctions (WD), and absence among freemen (AF). E refers to societies where an elite class existed, who were differentiated from property less lower class, and controlled scarce resources and land. They had some similarities in terms of stratification to those classified as D which were societies stratified into a hereditary aristocracy and a lower class. C refers to societies with a complex stratification into social classes associated with significant differences in occupational status. WD refers to societies with status distinctions based on property owned but this had not materialized into distinguishable or hereditary social classes. Finally, in the AF societies, there were no significant class distinctions except for variations in individual repute based on skill or wisdom ([Murdock, 1962, 1967](#)). The distribution of the ethnic groups across Africa is shown in [Figure 1](#). We see a clear mix of the different types of societies though D and E societies were found predominantly in the desert areas of Mali, Niger and Algeria, as well as parts of Central and Western Africa while those classified as absence among freemen are spread across Eastern and Central Africa.

INSERT TABLE 1 HERE

As can be seen in [Table 1](#), the majority of historical African societies were of the latter category at 43 percent while rigid societies with regards to social status progression (dual and elite) made up 38 percent. We assigned the ethnic groups into two groups based on the

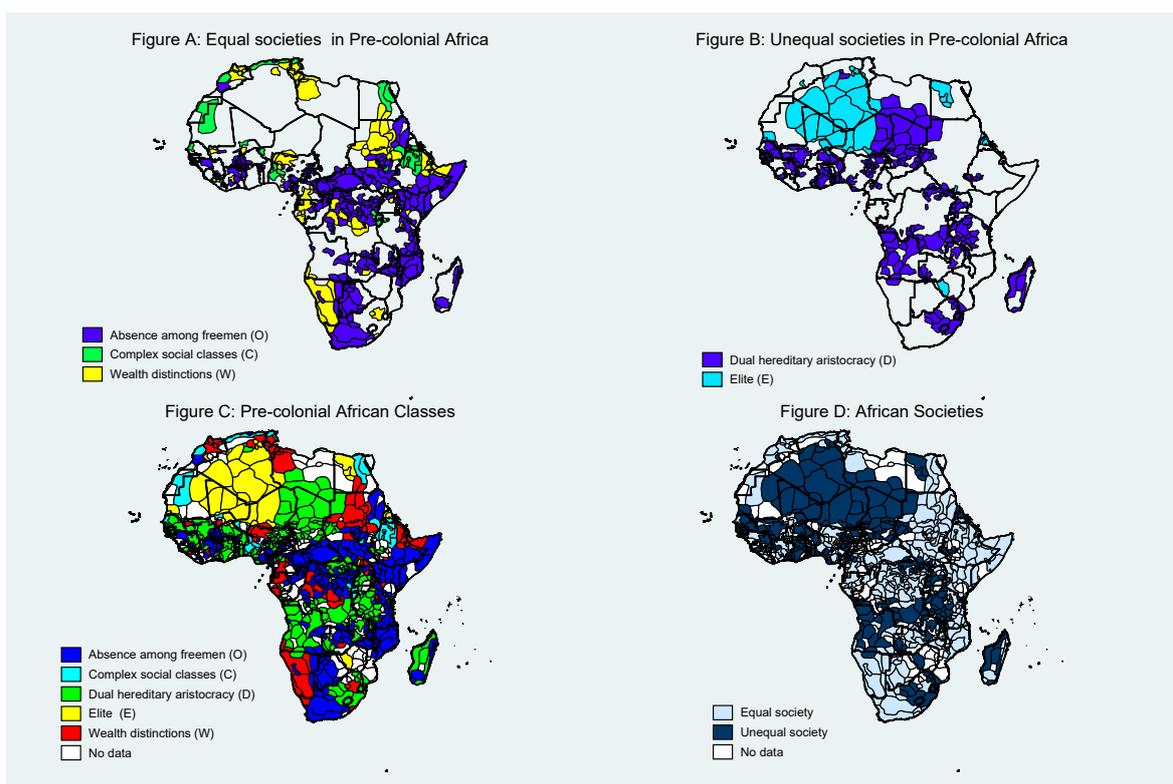
stratification system present in the society. We assigned as fluid (equal) societies those which were classified as AF, C and WD. This is because of characteristics indicating that personal effort could lead to change in circumstance and status in these societies. We also assigned those in E and D groups as rigid (unequal) societies where circumstantial factors such as birth played a role in determining their eventual status. To develop the index of society type assigned to the country, we take into consideration the mean sizes of the local community for that period which was computed from census data or other evidence present at the time and use the classification of the identified dominant group to classify the country as having a rigid pre-colonial society or fluid.¹¹ In few cases, I could not ascertain the clear majority of the pre-colonial population, and these were assigned into a third category, mixed. To identify the country where the ethnic groups reside, I utilized the dataset of [Michalopoulos and Papaioannou \(2013\)](#) which links the ethnic tribes to the ethnographic atlas classification of [Murdock \(1959\)](#) and [Murdock \(1967\)](#) to their respective countries. As shown in [Figure 2](#), the majority of African countries were dominated by rigid pre-colonial societies (45 percent) with the rest of the countries being classified as either fluid and mixed.

Use of any historical database requires validation of the accuracy of the data collected. To that end, I cross validated Murdock's dataset with regard to the class systems by checking select ethnic groups against the Human Resource Area Files database housed at Yale university for the cultural set up and stratification systems.¹² In addition, previous researchers who utilized have cross-validated Murdock's database and found it to be a reliable source particularly for Africa where most of the ethnographic studies were conducted ([Rijpma and Carmichael, 2016](#)). [Archibong \(2018\)](#) found a 0.70 correlation between ethnicities identified on the Murdock's map and their location in 2008-2012 using the Afrobarometer surveys. [Michalopoulos and Papaioannou \(2013\)](#) also validated the database as correctly identifying jurisdictional hierarchies in pre-colonial African ethnic groups and argued that any inherent subjectivity would not weaken justification of using the data given that the bias was not systematic. In terms of the spatial distribution, [Nunn and Wantchekon \(2011\)](#), also using the Afrobarometer survey shows that ethnic groups are still occupying the same regions as in pre-colonial days and found a correlation of 0.55 between between the location of pre-colonial ethnic groups as recorded by Murdock and where they are residing and also notes that there is a move towards returning to the homeland amongst Africans. It is important

¹¹For example, in Angola the dual society were more in absolute numbers and had the largest recorded density of between 200-399 per group when compared to the other classifications. Similarly, for Botswana, the more fluid classified societies were smaller (fewer than 50) than those with dual societies who had between 5000 to 50,000 members. Burkina Faso has numerous small equal societies but the majority were dual (between 5000 to 50,000 members). This was also the case for Ghana and Nigeria. See the appendix for detailed country information

¹²In particular, I examined the Yoruba, Songhai, Amhara and Nupe for their social organisation and to validate the classification system. For example, amongst the Yoruba, social status was determined by sex, age, descent group and wealth though emerging class distinction are along the lines of wealth, education and occupation ([Barnes, 2009](#)).

Figure 1: Pre-colonial African Class Stratification



Source: Authors computation from [Murdock et al. \(2010\)](#)

to note that though this dataset provides ethnographic data of African society and has been used as a snapshot of pre-colonial Africa, it contains observations of the societies collected over a period of time ranging from 1830 to 1960, with around half are from before 1920. It can therefore be argued, in agreement with [Henderson and Whatley \(2014\)](#), that it may be a misrepresentation to use it as a representation of only the pre-colonial period. However, to the extent that the number of Europeans involved in administration of the colonies was limited [Herbst \(2014\)](#), I argue that it still correctly portrays the different traditional systems that were historically in existence.¹³

3.2 Household Data

Country level analysis was conducted on six countries. These are Ghana, Guinea, Madagascar, Malawi, Niger and Nigeria. I used nationally representative household surveys which collect retrospective parental education data and from which we could identify the ethnicity of the individuals. The countries (survey: year) are Ghana (Ghana Living Standards Survey (GLSS): 2017), Guinea (Integrated Core Survey for Poverty Assessment (EIBEP): 2002),

¹³[Henderson and Whatley \(2014\)](#) provide a discussion on the time duration of the ethnographic atlas and its possible implications.

Table 1: Distribution of Ethnic Classification Systems in Pre-colonial Africa

Class Stratification System	Type	Number of Groups	%
Class systems - Disaggregated			
	Absence among freemen	246	43.08
	Wealth distinctions	77	13.49
	Elite	49	8.58
	Dual	170	29.77
	Complex	29	5.08
Category of Society			
	Fluid Societies	352	61.65
	Rigid Societies	219	38.35
Observed societies			
	Recorded Societies (with class data)	571	83.60
	Missing Class Data	112	16.40

Fluid Societies: Absence among freemen, Wealth distinctions, Complex; Rigid Societies: Elite, Dual
Source: Authors computation from [Murdock \(1959, 1962, 1967\)](#)

Madagascar (Enquête Permanente Auprès Des Ménages (EPM): 2005), Malawi (Integrated Household Survey: 2017), Nigeria (General Household Survey Panel(GHSP): 2010) and Niger (National Survey on Household Living Conditions and Agriculture (ECVMA): 2014). These surveys collect education information on all occupants of the household. Households, clustered by enumeration areas, were randomly selected and sampling weights were used to make the sample nationally representative.

Dependant Variable

In this study, the education attainment of the children is the dependent variable and is operationalized as the number of years of schooling that an individual attains. We limit our observations to individuals aged 20 years and above. We convert the years of schooling into categorical measures for the mobility measures and transition matrices.

Independent Variable

The main independent variable is parental education. It is measured as the highest number of years of schooling of either parent in the household. We used parental maximum, as opposed to the average because the low level of education of the mothers in the households in our sampled households may significantly bias downwards the average parental years of schooling/ education level. Therefore, our regression coefficient can be interpreted as being the lower bound of education persistence across generations. We refer to the persistence from parents education and children's education as parental capital, in line with the mobility literature.

Control Variables

We controlled for age of the individuals, the gender of the children, number of individuals present in the household (household size) and to control for non-linearities arising from

the cohort effect, we used age squared. As discussed, other factors affected education attainment of the individuals and we introduce fixed effects for the ethnic group, region of residence, and religion group belonging. Ethnic group is observed for each respondent in Ghana, Niger, Nigeria and Madagascar. For Malawi and Guinea, only the main language used by the head of household is observed and we therefore limit our observations to their direct relatives (Children, parents and those classified as direct relatives to the head of household).¹⁴ Dummy variables were used for the respondent membership in the ethnic groups from the pre-colonial period.

3.3 Intergenerational Education Persistence in Africa and Pre-colonial Society: Some Stylized facts

We use data from the Global Database for Intergenerational Mobility (GDIM) collected by the World Bank for 148 countries worldwide and standardized for regional comparison, to provide a general representation of the linkage between the type of society that existed in the pre-colonial periods and intergeneration persistence in Africa. The GDIM collects information for 41 of the 52 Sub-Saharan African countries, and uses both retrospective and co-resident information to compute the intergenerational persistence (GDIM, 2018).¹⁵ Education attainment is measured in terms of years of schooling. For our analysis, we focus mainly on those in the 1980 birth cohort, though mobility patterns are also provided for those in the 1940 and 1960 birth cohorts. Based on our above categorization of the countries as fluid or rigid, we develop the following assertions:

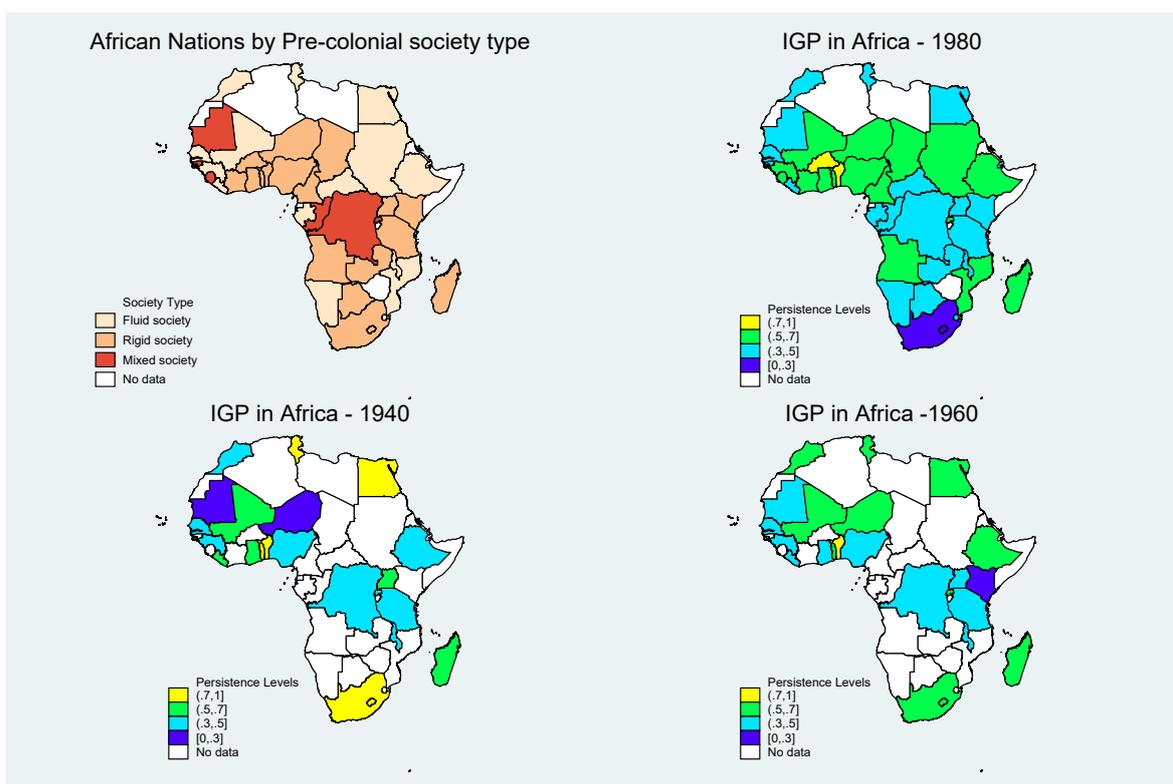
Fact 1: East and Southern African countries previously colonised by Britain have lower persistence irrespective of pre-colonial society characteristics; West African societies which were rigid have high persistence irrespective of colonial origin.

We see in Figure 2 that in East and Southern Africa, intergenerational persistence in the 1980 birth cohort is lower than in Western Africa. This is with the exception of the two former Portuguese colonies, Angola and Mozambique. This observation is in tandem with arguments that geographic location of African countries have implications for development, as argued by Gallup et al. (1999), albeit in this case through persistence in education. It also points to an association between colonial origin and intergenerational mobility for African

¹⁴The exceptions are made for those groups classified as matrilineal groups for whom all relatives of the head of household and the spouse are included

¹⁵Though the focus of this article is on Sub-Saharan African, we include Egypt, Djibouti, Morocco and Tunisia which are from North Africa because some of the ethnic groups for which information was collected by Murdock (1967) and linked to countries by Michalopoulos and Papaioannou (2013) are split into these countries

Figure 2: African Countries by society type and IGP



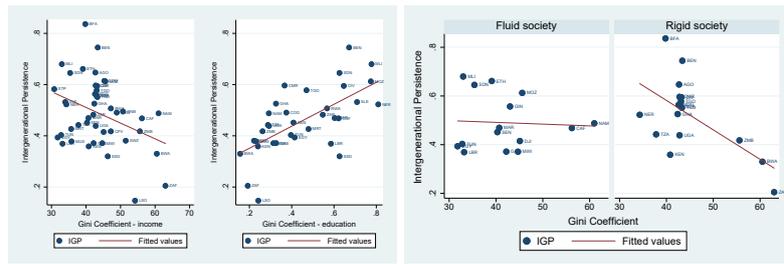
Source: Authors computation from [GDIM \(2018\)](#); [Murdock et al. \(2010\)](#)

countries as Angola and Mozambique were previous colonies of Portugal while the rest were British colonies. For West African countries, those dominated by rigid pre-colonial societies have high intergenerational persistence. This is the case even for former British colonies like Ghana and Nigeria. This shows that in these countries, pre-colonial African rigidities have resurfaced despite high mobility levels observed among the 1940 and 1960 birth cohort. It also indicates that factors driving mobility may be different for the geographic blocs on the continent.

Fact 2: There is a negative relationship between income inequality and intergenerational persistence in countries that were characterised by rigid societies, education inequality shows a positive relationship irrespective of type of precolonial society

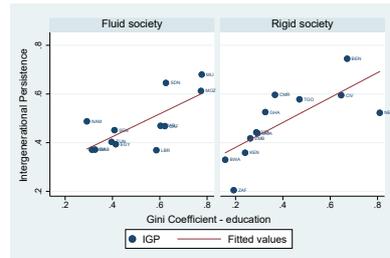
We plotted the mobility measure against inequality measures in education and income for the countries based on their pre-colonial societies and as we can see in Figure 3, there is a difference in the relationship between income inequality and intergenerational persistence in education for countries based on pre-colonial classification. The Great Gatsby curve, coined by [Krueger \(2012\)](#) illustrates the positive relationship between intergenerational so-

Figure 3: Intergenerational Persistence in Africa



(a) Countries

(b) Income inequality, by society



(c) Education inequality, by society

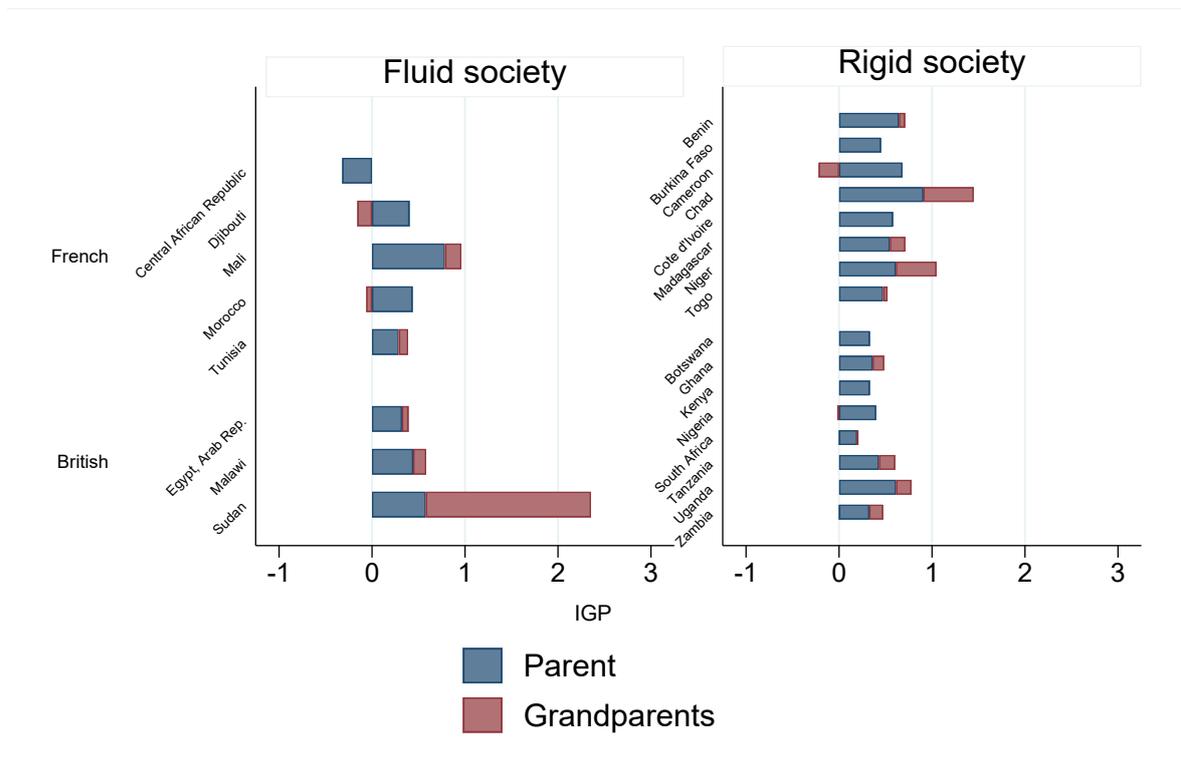
Source: Authors computation from [GDIM \(2018\)](#) and [Ziesemer \(2016\)](#)

cial mobility and a measure of inequality. When mapped against education inequality using the [Ziesemer \(2016\)](#) education gini coefficient for 2005, there is a positive relation between persistence and inequality and no apparent differences in relation based on pre-colonial society type. However, when measured against income inequality, using the [World Bank \(2018\)](#) gini income coefficient for the year closest to when the mobility measure is estimated, we observe a steep negative relationship in countries classified as having rigid pre-colonial societies compared to those which had fluid societies. For the countries with more fluid pre-colonial societies, a slightly positive relation obtains but there seems to be no conclusive relationship between intergenerational persistence and inequality. This finding can be understood as a variation of the Kuznet curve which posits that during the process of economic development, income inequality first rises before decreasing, an inverted u-curve ([Kuznets, 1955](#); [Barro, 2000](#)). This finding is supported by [Gregorio and Lee \(2002\)](#) who finds that relationship between increased education attainment, measured as reduced persistence levels in this study, and income inequality is ambiguous and depends on the returns to and initial levels of education present in the country. I interpret my findings as suggesting that the initial dispersion in terms of education, and level of, in rigid pre-colonial societies was much higher than in fluid societies.

Fact 3: Looking at multiple generation persistence in Africa shows evidence of downward mobility in some countries - all of them former French colonies, with fluid precolonial societies

Downward mobility across multiple generations can be seen in Cameroon, Central African Republic, Djibouti and Morocco. These countries are located in different parts of Africa and the common factor is that they were previously colonised by France and had pre-colonial African societies that were mainly fluid (See Figure 4). This observation goes against the generally accepted norm that education attainment has been on the increase over time. It points to the need to further understand how these two factors may interact with the country specific environment and education policies to explain the decrease in education attainment over successive generations.

Figure 4: Multi-generational mobility, by society and colonial origin



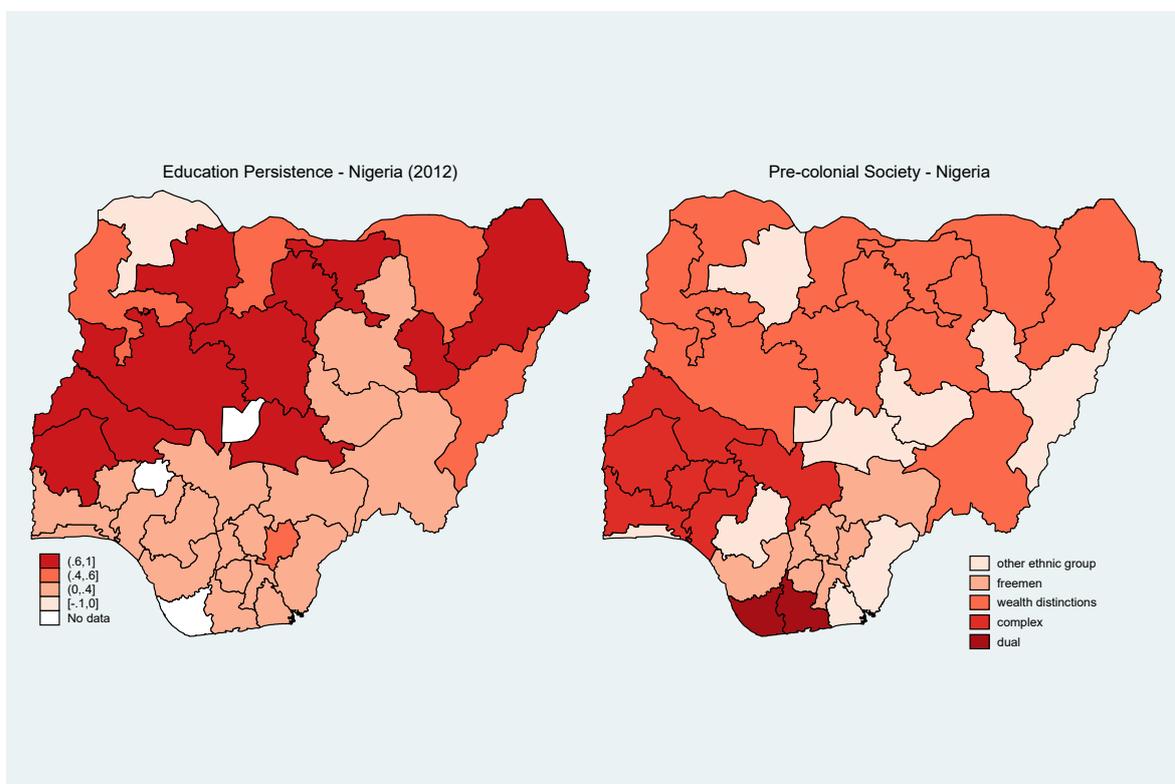
Source: Authors computation from [GDIM \(2018\)](#)

Fact 4: Within country analysis of intergenerational education persistence in each federal state in Nigeria shows that those dominated by societies historically characterised as either WD or C (fluid societies) have higher levels of persistence compared to others

An analysis of intergenerational persistence within Nigeria reveals broad disparities geographically and based on historic type of society. We see high levels of persistence in the Northern areas, compared to the South, regions occupied by fluid ethnic groups classified as either WD or C. As shown in Figure 5, there is also downward mobility in one of the Northern states which classified as dominated by WD societies.

In summary, the stylized facts point to an association between the pre-colonial African

Figure 5: Intergenerational persistence in Nigeria, comparison to historical class stratification



Source: Authors computation from [GDIM \(2018\)](#)

societies and intergenerational persistence in Africa. While the mechanism is not evident, there are some pointers to colonial origin and geography as key to understanding the drivers in differences in mobility. We explore this further in the country analysis that follows.

3.4 Descriptive Statistics

The descriptive statistics of the dependent variable and main independent variable are presented in Tables 2 and 3. The highest education mean years of schooling of children is seen in Ghana at 7.40 years while the lowest is seen in Madagascar at 2.18 years. For the mothers, Nigeria had the highest mean years of schooling at 2.8 years of schooling while the lowest is seen in Niger. In terms of gender disparities between the children and their parents, we see the least amount of disparity in Madagascar where there is a difference of less than a year between the average years of schooling of the parents and the children.

Table 2: Sampled Countries

Country	Sample Description		Mean Years of Schooling			EF
	Year	Sample Size	Children	Mother	Father	
Ghana (R)	2017	25,723	7.40	2.62	4.49	0.673
Guinea (F)	2002/03	10,840	2.34	0.61	0.99	0.739
Madagascar(R)	2005	20,385	2.18	1.67	2.31	0.879
Malawi (F)	2017	20,034	5.94	0.78	1.40	0.674
Niger (R)	2014	8,839	2.90	0.30	0.57	0.651
Nigeria (R)	2010	11,811	6.81	2.78	3.91	0.850

R-rigid, F-fluid, EF-Ethnic fractionalization index ([Alesina et al., 2003](#))

With regards to the distribution of the historical ethnic groups, as can be seen in Table 3, different countries have different compositions.¹⁶ A measure of the degree of heterogeneity with respect to number of ethnic groups is given by the ethnic fractionalization index developed by [Alesina et al. \(2003\)](#) and presented in the table. In all the countries included in the analysis, D societies found in all of them, with AF societies being in five of the six countries. Other types of societies are found less commonly, though we did not have ethnic groups from E groups in any of the included countries. In all the countries except Guinea, the ethnic groups with historic D societies have higher levels of attainment than the other classified ethnic groups. For Guinea, the AF category have slightly higher average years of schooling than the other groups. There is a clear difference in education years of schooling between those who identified as being of European descent (or from outside the country for Ghana) indicating that the associated privileges of being European has continued into contemporary

¹⁶We updated the following ethnic group classification from [Murdock et al. \(2010\)](#): Ghana - Freeman (Sisala), Dual (Gurunse); Guinea - Freeman (Toma/ Lomagouwe, Bassari); Madagascar - Free men (Betsimisaraka, Mahafaly, Sihanaka, Tsimihety); Malawi - Freeman(Sena); Nigeria - Freeman(Igbo), Wealth distinction (Hausa/Fulani)

Africa. The average age of the respondents in our sampled country is similar around 40 years of age.

INSERT TABLE 3 HERE

Table 3: Country Level Pre-colonial Classification Descriptive Statistics

Country	Pre-colonial Classification	Education (Years of schooling)			n	Age [°]
		Children	Mother	Father		
Ghana	Freemen	5.31	1.15	2.06	5,767	40.2
	Dual	8.22	3.14	5.37	12,205	40.63
	Other local groups [†]	7.45	2.61	4.38	8,797	40.7
Guinea	Freemen	1.59	0.32	0.45	313	43.4
	Wealth Distinct	1.47	0.27	0.59	3,541	45.6
	Dual	1.48	0.39	0.66	2,656	44.8
	Other local groups [†]	3.02	0.72	1.49	2,491	42.2
	Foreign ^ψ	6.24	1.85	2.96	1,839	40.6
Madagascar	Freemen	1.54	1.19	1.80	4,935	38.0
	Dual	2.59	1.99	2.57	8,931	38.6
	Other local groups [†]	2.05	1.63	2.34	6,313	37.9
Malawi	Freemen	5.83	0.74	1.34	17,753	39.2
	Dual	8.17	1.41	2.50	1,829	41.1
	Other local groups [†]	5.46	0.50	0.92	1,439	42.3
	Foreign ^ψ	15.51	9.97	12.19	41	41.8
Niger	Wealth Distinct	2.92	0.28	0.50	5,372	40.3
	Complex	2.84	0.37	0.71	2,391	41.1
	Dual	3.03	0.25	0.53	879	41.0
	Other local groups [†]	5.70	0.92	0.10	8	41.0
	Foreign ^ψ	7.32	1.51	2.80	189	42.1
Nigeria	Freemen	7.55	1.94	2.78	2,581	43
	Wealth Distinct	4.41	3.01	3.84	3,823	38.5
	Complex	8.58	2.80	4.43	2,401	41.4
	Dual	10.04	3.71	5.57	663	38.0
	Other local groups [†]	6.87	2.93	4.06	2,343	39.0

[†] refers to ethnic groups which could not be matched to a class code in the dataset

^ψ foreign in this case refers to those who identify with European descent or from outside the country

Age[°] = average age in years

3.5 Econometric Framework

The econometric framework for the country-level analysis is based on the work of [Becker and Tomes \(1986\)](#). I adapt the model and estimate the standard model which has parental education level as the independent variable and child outcome as the dependent variable.

I estimate relative mobility levels for each country and utilize an interaction model of the form:

$$y_{ij(t)}^k = \beta_0 + \beta_1 y_{ij(t-1)}^k + \beta_2 E_j^k + \beta_3 E_j^k * y_{ij(t-1)}^k + \beta_5 \sum x_{ij}^k + \epsilon_{(t)} \quad (1)$$

Where $y_{ij(t)}^k$ denotes years of education for child i in ethnic group j which falls under pre-colonial specification k . $y_{ij(t-1)}^k$ corresponds to the maximum parents years of education, E_j^k is the pre-colonial ethnic classification dummy variable of ethnic group j , and the error term is given by $\epsilon_{(t)}$. The linear estimate of β_1 is reported as one of the measures of intergenerational persistence of educational attainment. Alternatively, $1 - \beta_1$ is a measure of the intergenerational mobility. The interaction model allows us to examine whether there are statistically significant differences in persistence between the ethnic classes, and is given by the coefficient β_3 . To ensure a more comprehensive comparison and interpretation, I evaluate using a second model using demeaned values of parental years of schooling.¹⁷ I cluster the analysis at enumeration area level and include region, religion and ethnic group fixed effects. Further robustness checks are done where I include only fathers and sons in the estimations.¹⁸

Possible selection bias in the regression model can be overcome by randomization of individuals into the different classifications and in the paper, I argue that an individuals assignment into historically fluid or rigid society is essentially stochastic, meaning that selection bias is minimized despite using survey data. To the extent that the country borders were drawn on the African continent without regard to the societal ethnic makeup ([Michalopoulos and Papaioannou, 2016](#)), this provides a set up for a natural experiment which would mimic a randomized trial and reduce the size of the selection bias ([Angrist and Pischke, 2008](#)). However, to guard against possible omitted variable bias or measurement error, I instrument for type of historical society using geographic variables following the argument of Suret-Canale as cited in [Gakou \(1987\)](#) who argues that geography of a region was related to the stratification system present in the society.

We compliment the regression analysis using mobility and transition matrices which show the probability of successive generations remaining in the same education category as their parents for the different ethnic classifications. Following standard practices, we compute the Shorrocks/Prais, Bartholomew, Eigen Value and determinant indices. Aside from the Bartholomew index, the other measures are referred to as convergence mobility indices and measure the degree to which future states do not depend on the initial state i.e. how rapidly parental education origin is forgotten. In comparison, the Bartholomew index is an equilibrium mobility index and measures the extent to which the process leads to movements

¹⁷By demeaning, I subtract the sample average from the data and it has been noted that in linear models, the effect of this is innocuous. See [Bao et al. \(2015\)](#) on demeaning in non-linear models.

¹⁸The results of the sensitivity analysis are not presented but are available upon request from the author.

between states over time, i.e. interprets mobility as movement between states and computes the average number of categories moved between generations (Bartholomew, 1967; Aebi et al., 2006; Blanden, 2009). The mobility functions, which are monotonic, are restricted to the range of zero and one, with a value of zero representing immobility and one implying perfect mobility (Shorrocks, 1978).¹⁹

In order to compute both the transition matrices and mobility matrices, we divide the education attainment of the parents and the children into four main categories, namely, those with no education, primary, secondary and post secondary education.²⁰ For all the countries, these categories represent transitions between major institutional divisions of schooling. Bootstrapping procedures are used to simulate the sampling distribution of the statistics in the mobility matrices.

4 Results

The results from the OLS regression model are presented in Tables 4 to 9. The results, presented in alphabetical order, are discussed for each country and show differences in persistence within the ethnic classifications. Model 1 is estimated with no control variables and fixed effects for ethnic groups, region and religion are gradually introduced in the specified models presented, though the estimated coefficients for these variables are not shown.²¹

Given the number of countries included in the analysis, I provide a summary of the results for the most refined specified models, shown in column 3 and 4, and focus on the interaction coefficient in countries where it is significant. Statistically significant interactions are found in four of the six countries, as shown in column 3. These are Ghana, Madagascar, Malawi and Nigeria. The models are all statistically significant based on the omnibus F-statistic and a Wald test of the interactions found our results to be significant. This means that for these countries, there are differences in education persistence between the ethnic classifications based on the class system that was in existence in the pre-colonial period. Intergenerational persistence is lower for D societies compared the AF in Ghana, Malawi and Nigeria. Alternatively, it is higher in Madagascar, Guinea and Niger, though the interaction is statistically insignificant in the latter two. This implies that the country level measure of persistence is appropriate in analysing mobility in Guinea and Niger but there are differences in persistence between the pre-colonial society groups for the other countries and understanding intergenerational persistence should be done in consideration of these differences. Our results are in

¹⁹The specification of these commonly used mobility matrices are presented in the appendix

²⁰For Guinea and Niger, we used introduced a middle school category in recognition of the education system in the country

²¹The full model with the coefficients of the fixed effects and control variables are available from the author upon request.

line with findings of significant within country heterogeneity in terms of intergenerational mobility by [Alesina et al. \(2019\)](#).

For Guinea and Niger, the interaction coefficients are not significant and hence I focus on the main effects.²² Education persistence from parents to children is higher in Niger than Guinea with higher persistence in the D group though the difference is not statistically significant. The partial effect of the pre-colonial ethnic specifications shows that children in the WD in Guinea have lower average years of schooling than the other groups and the differences are statistically significant. Those who identified as French (European descent) have much higher levels of education than the indigenous ethnic groups indicating persisting inequalities in terms of education access, possibly along racial lines though we do not directly observe race of the respondents in the surveys. A possible reason for this could be differences in social capital between the groups which lead to different opportunity sets available. In Niger, the partial effect of the ethnic classification also shows higher levels of education for those who were classified as foreign. Similar to Guinea, those in WD had lower levels of education than the other pre-colonial specifications though we only find statistically significant differences when compared to the D group.

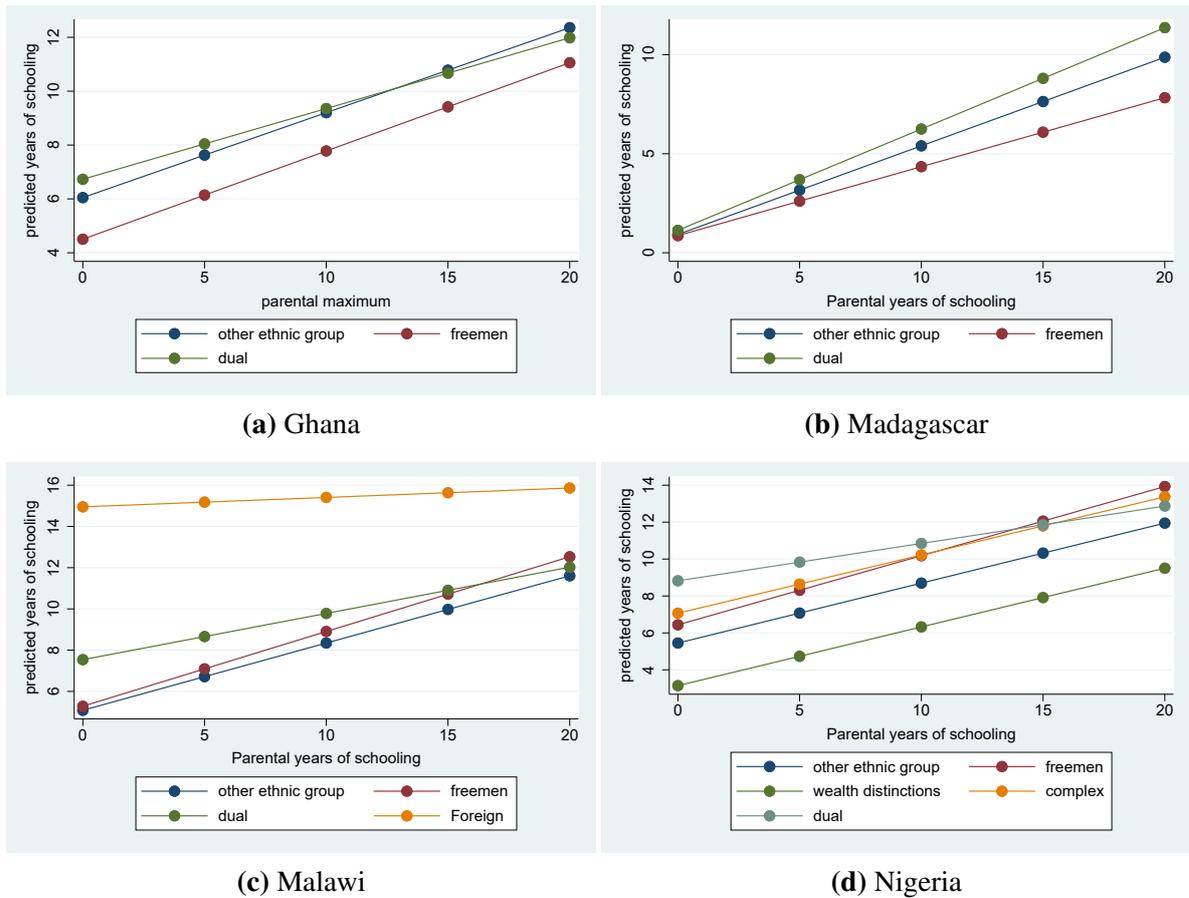
For the other countries, results of significant interactions are consistent except for Ghana. When religion fixed effects are introduced in the model, interaction results from Ghana are no longer significant indicating the importance of religion differences, which cut across the pre-colonial ethnic classifications, in explaining education inequalities. However, persistence among D groups is still lower than those in AF, in line with the findings from Malawi and Nigeria. Margin plots which show predicted values of children's years of schooling based on specified years of schooling of their parents for the different ethnic classifications in countries which had significant interactions are shown in Figure 6. The margin plots are for the original values of the observation, rather than demeaned values and are a visualization of the *simple slopes* for the different ethnic classifications ([Curran et al., 2004](#)).²³ Disordinal interactions are observed amongst the ethnic classifications, with the exception of Malawi for the respondents of European descent for whom an ordinal interaction is observed from the local ethnic groups. This can be interpreted as a persistence of ranked system with respect to ethnic relations as discussed by [Horowitz \(1985\)](#), whereby at each level of parental education, the predicted years of schooling of those who identified with the European descent is significantly higher than the local group, though the gap reduces at higher levels of parental education.

Parallel lines indicate that the interaction is insignificant and this can be seen for dif-

²²For Niger, there was a significant interaction between WD and other ethnic specification, with findings of downward mobility in the other ethnic groups classification. However, because I was not able to identify the precolonial class system for ethnic groups under other, I do not analyse the result.

²³For Ghana, we illustrate column 3, which does not include religion, and for which the interaction was significant. For the other countries, the illustrations are for the full model

Figure 6: Margin Plots - Predicted values of children education



ferences between groups, particularly in Nigeria where persistence was only significantly different for those in the D group. I used the [Johnson and Neyman \(1936\)](#) procedure to identify the regions of significance for the groups, i.e. the areas for which education persistence is significantly different between the classifications. The rule of thumb is that areas further from the intersection are significantly different and the plots reveal that for Ghana, Malawi and Nigeria, the differences are mainly at lower levels of parental education while for Madagascar, it is at higher levels of education.²⁴ We explore these disparities further in the next section using mobility and transition matrices.

Mobility and Transition Matrices

We examine the distribution of the extent to which children's education is dependent on the parents education in the mobility matrices presented in Tables 10 and 11. The results are presented separately based on dominant pre-colonial society and highlight differences between

²⁴[Curran et al. \(2004\)](#) sets out the formal test of regions of significance as follows: choose a specific critical value for the test statistic and then solve the main equation for the specific values of parental persistence that yield this critical value.

Table 4: Country regression results - Ghana

	Dependent Variable, respondent education level y_t							
	Model 1				Model 2 (Demeaned Values)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parental capital	0.602*** (0.026)	0.330*** (0.031)	0.328*** (0.029)	0.308*** (0.026)	0.650*** (0.028)	0.355*** (0.033)	0.353*** (0.031)	0.332*** (0.028)
Class (Dual)	1.824*** (0.213)	-1.887* (0.878)	-1.415 (0.925)	-1.431 (0.920)	1.321*** (0.168)	-2.073* (0.880)	-1.634 (0.933)	-1.619 (0.926)
Class (Other)	1.144*** (0.230)	2.318** (0.776)	2.617** (0.829)	1.836* (0.867)	0.870*** (0.178)	2.283** (0.776)	2.539** (0.834)	1.798* (0.872)
PC*Class(Dual)	-0.154*** (0.029)	-0.059 (0.032)	-0.065* (0.031)	-0.056 (0.028)	-0.162*** (0.031)	-0.059 (0.034)	-0.065* (0.033)	-0.055 (0.030)
PC*Class (Other)	-0.084** (0.031)	-0.005 (0.033)	-0.012 (0.032)	-0.001 (0.030)	-0.089** (0.033)	-0.002 (0.035)	-0.010 (0.034)	0.002 (0.032)
Constant	3.873*** (0.176)	10.061*** (0.457)	9.866*** (0.533)	8.698*** (0.556)	5.883*** (0.143)	11.119*** (0.449)	10.941*** (0.534)	9.708*** (0.557)
Controls for x	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Ethnic FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Region FE	No	No	Yes	Yes	No	No	Yes	Yes
Religion FE	No	No	No	Yes	No	No	No	Yes
R^2	0.274	0.416	0.421	0.433	0.277	0.417	0.422	0.434
F								

*p<0.05, ** p<0.01, *** p<0.001; n=27,853

Base for interaction and categorical results- Absence among Freeman group

Table 5: Country regression results - Guinea

	Dependent Variable, respondent education level y_t							
	Model 1				Model 2 (Demeaned Values)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parental Capital	0.383*** (0.038)	0.245*** (0.034)	0.254*** (0.035)	0.250*** (0.034)	0.384*** (0.040)	0.246*** (0.036)	0.255*** (0.037)	0.251*** (0.035)
Class (Freemen)	0.227 (0.264)	-1.054*** (0.141)	1.698*** (0.490)	1.993*** (0.563)	0.037 (0.282)	-1.193*** (0.205)	1.487** (0.508)	1.774** (0.571)
Class (Dual)	-0.094 (0.153)	-0.420*** (0.124)	1.244*** (0.301)	1.242*** (0.305)	0.040 (0.185)	-0.301 (0.154)	1.303*** (0.295)	1.304*** (0.297)
Class (Other)	1.181*** (0.236)	0.097 (0.403)	1.495** (0.496)	1.646** (0.545)	1.199*** (0.234)	0.107 (0.410)	1.463** (0.492)	1.617** (0.541)
Class (Foreign)	3.982*** (0.437)	2.854*** (0.298)	4.363*** (0.328)	4.298*** (0.321)	3.936*** (0.395)	2.865*** (0.273)	4.252*** (0.291)	4.177*** (0.288)
PC*Class(Freemen)	-0.103 (0.074)	-0.098 (0.064)	-0.130 (0.071)	-0.135 (0.070)	-0.100 (0.075)	-0.091 (0.065)	-0.125 (0.072)	-0.128 (0.071)
PC*Class (Dual)	0.066 (0.059)	0.059 (0.051)	0.027 (0.051)	0.029 (0.050)	0.069 (0.060)	0.061 (0.052)	0.028 (0.052)	0.030 (0.052)
PC*Class(Other)	0.002 (0.050)	0.001 (0.044)	-0.019 (0.046)	-0.017 (0.045)	0.009 (0.052)	0.004 (0.046)	-0.016 (0.048)	-0.014 (0.047)
PC*Class(Foreign)	-0.031 (0.050)	0.001 (0.042)	-0.062 (0.043)	-0.067 (0.043)	-0.028 (0.052)	0.002 (0.044)	-0.062 (0.045)	-0.068 (0.044)
Constant	1.232*** (0.090)	3.496*** (0.329)	2.383*** (0.478)	2.317*** (0.482)	1.957*** (0.112)	3.964*** (0.332)	2.874*** (0.477)	2.801*** (0.480)
Controls for x	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Ethnic FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Region FE	No	No	Yes	Yes	No	No	Yes	Yes
Religion FE	No	No	No	Yes	No	No	No	Yes
R^2	0.208	0.340	0.358	0.362	0.207	0.339	0.358	0.361

*p<0.05, ** p<0.01, *** p<0.001; n=13,016

Base for interaction and categorical results- Wealth Distinct groups

Table 6: Country regression results - Madagascar

	Dependent Variable, respondent education level y_t							
	Model 1				Model 2 (Demeaned Values)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parental Capital	0.415*** (0.029)	0.375*** (0.026)	0.367*** (0.027)	0.345*** (0.026)	0.440*** (0.030)	0.398*** (0.028)	0.389*** (0.028)	0.365*** (0.027)
Class (Dual)	-0.014 (0.144)	-1.266*** (0.232)	-0.320 (0.318)	-0.324 (0.305)	0.456** (0.154)	-0.909*** (0.229)	-0.031 (0.314)	-0.010 (0.302)
Class (Other)	-0.079 (0.136)	-0.617* (0.291)	-0.037 (0.324)	-0.056 (0.329)	0.188 (0.134)	-0.428 (0.282)	0.136 (0.314)	0.130 (0.321)
PC*Class(Dual)	0.242*** (0.041)	0.174*** (0.036)	0.154*** (0.035)	0.166*** (0.034)	0.247*** (0.043)	0.179*** (0.038)	0.159*** (0.037)	0.172*** (0.036)
PC*Class(Other)	0.136** (0.050)	0.099* (0.047)	0.092* (0.042)	0.100* (0.042)	0.141** (0.052)	0.104* (0.049)	0.097* (0.045)	0.106* (0.045)
Constant	0.736*** (0.096)	1.309*** (0.322)	1.558* (0.628)	1.136 (0.615)	1.574*** (0.097)	2.025*** (0.309)	2.255*** (0.611)	1.787** (0.602)
Controls for x	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Ethnic FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Region FE	No	No	Yes	Yes	No	No	Yes	Yes
Religion FE	No	No	No	Yes	No	No	No	Yes
R^2	0.255	0.303	0.317	0.327	0.260	0.307	0.321	0.330

*p<0.05, ** p<0.01, *** p<0.001; n=21,517

Base for interaction and categorical results- Absence among Freeman group

Table 7: Country regression results - Malawi

	Dependent Variable, respondent education level y_t							
	Model 1				Model 2 (Demeaned Values)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parental Capital	0.577*** (0.015)	0.374*** (0.016)	0.370*** (0.015)	0.363*** (0.015)	0.596*** (0.015)	0.387*** (0.016)	0.383*** (0.016)	0.375*** (0.016)
Class (Dual)	2.059*** (0.198)	1.553*** (0.438)	1.674*** (0.478)	1.510** (0.474)	1.573*** (0.170)	1.126** (0.434)	1.246** (0.474)	1.104* (0.470)
Class (Other)	-0.144 (0.178)	0.759* (0.300)	0.322 (0.325)	0.290 (0.320)	-0.182 (0.154)	0.646* (0.288)	0.201 (0.311)	0.187 (0.306)
Class (Foreign)	9.012*** (1.143)	7.453*** (0.931)	7.333*** (0.938)	7.302*** (0.885)	7.714*** (0.956)	6.513*** (0.751)	6.403*** (0.756)	6.394*** (0.723)
PC*Class(Dual)	-0.165*** (0.026)	-0.146*** (0.026)	-0.146*** (0.026)	-0.138*** (0.026)	-0.170*** (0.027)	-0.151*** (0.027)	-0.151*** (0.027)	-0.143*** (0.027)
PC*Class(Other)	-0.015 (0.035)	-0.040 (0.036)	-0.042 (0.037)	-0.036 (0.037)	-0.013 (0.037)	-0.039 (0.038)	-0.042 (0.038)	-0.036 (0.038)
PC*Class(Foreign)	-0.451*** (0.087)	-0.325*** (0.076)	-0.323*** (0.077)	-0.317*** (0.074)	-0.474*** (0.090)	-0.340*** (0.078)	-0.339*** (0.079)	-0.333*** (0.076)
Constant	4.954*** (0.072)	9.500*** (0.256)	10.176*** (0.365)	8.822*** (0.381)	6.671*** (0.062)	10.609*** (0.238)	11.276*** (0.344)	9.896*** (0.360)
Controls for x	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Ethnic FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Region FE	No	No	Yes	Yes	No	No	Yes	Yes
Religion FE	No	No	No	Yes	No	No	No	Yes
R^2	0.230	0.396	0.398	0.405	0.230	0.397	0.398	0.405

*p<0.05, ** p<0.01, *** p<0.001; n= 21,066

Base for interaction and categorical results- Absence among Freeman group

Table 8: Country regression results - Nigeria

	Dependent Variable, respondent education level y_t							
	Model 1				Model 2 (Demeaned Values)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parental Capital	0.620*** (0.025)	0.402*** (0.025)	0.374*** (0.023)	0.375*** (0.024)	0.647*** (0.028)	0.417*** (0.027)	0.388*** (0.025)	0.388*** (0.026)
Class (Wealth D.)	-2.833*** (0.372)	-3.569*** (0.329)	-1.112* (0.514)	-0.358 (0.516)	-3.789*** (0.326)	-4.016*** (0.315)	-1.337** (0.505)	-0.567 (0.506)
Class (Complex)	0.467 (0.396)	-0.611 (0.354)	0.513 (0.589)	1.452* (0.610)	0.028 (0.295)	-0.868** (0.295)	0.351 (0.587)	1.213* (0.599)
Class (Dual)	2.272*** (0.581)	1.746** (0.562)	1.531* (0.643)	1.614* (0.638)	1.183** (0.447)	0.947* (0.433)	0.811 (0.543)	0.886 (0.536)
Class (Other)	-0.962* (0.403)	-1.752*** (0.382)	-0.514 (0.418)	-0.227 (0.415)	-1.472*** (0.353)	-1.980*** (0.329)	-0.718 (0.389)	-0.445 (0.385)
PC*Class(Wealth D.)	-0.219*** (0.049)	-0.098* (0.041)	-0.060 (0.040)	-0.056 (0.039)	-0.237*** (0.053)	-0.104* (0.044)	-0.061 (0.043)	-0.057 (0.042)
PC*Class(Complex)	-0.108** (0.035)	-0.061 (0.031)	-0.041 (0.030)	-0.059 (0.030)	-0.104** (0.038)	-0.057 (0.033)	-0.036 (0.031)	-0.056 (0.032)
PC*Class(Dual)	-0.268*** (0.044)	-0.197*** (0.046)	-0.170*** (0.045)	-0.172*** (0.045)	-0.274*** (0.049)	-0.205*** (0.050)	-0.176*** (0.048)	-0.178*** (0.048)
PC*Class(Other)	-0.120** (0.041)	-0.051 (0.036)	-0.047 (0.034)	-0.050 (0.034)	-0.132** (0.045)	-0.054 (0.040)	-0.043 (0.037)	-0.044 (0.037)
Constant	5.644*** (0.258)	9.508*** (0.485)	7.838*** (0.545)	8.165*** (0.557)	8.202*** (0.199)	11.174*** (0.456)	9.374*** (0.529)	9.702*** (0.535)
Controls for x	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Region FE	No	No	Yes	Yes	No	No	Yes	Yes
Religion FE	No	No	No	Yes	No	No	No	Yes
R^2	0.287	0.410	0.424	0.438	0.283	0.409	0.423	0.437

*p<0.05, ** p<0.01, *** p<0.001; n=22,151

Base for interaction and categorical results- Freeman ethnic groups

Table 9: Country regression results - Niger

	Dependent Variable, respondent education level y_t					
	Model 1			Model 2 (Demeaned Values)		
	(1)	(2)	(3)	(4)	(5)	(6)
Parental Capital	0.597*** (0.034)	0.378*** (0.028)	0.368*** (0.029)	0.636*** (0.038)	0.401*** (0.031)	0.390*** (0.032)
Class (Complex)	-0.308 (0.225)	0.262 (0.223)	0.262 (0.303)	-0.150 (0.225)	0.401 (0.219)	0.380 (0.277)
Class (Dual)	0.065 (0.290)	1.331*** (0.310)	1.361*** (0.353)	0.289 (0.261)	1.467*** (0.286)	1.513*** (0.337)
Class (Other)	3.079** (1.150)	1.352 (1.272)	0.732 (1.277)	2.159* (0.843)	0.447 (0.944)	-0.160 (0.954)
Class (Foreign)	4.000*** (0.864)	2.609 (1.679)	2.809 (1.691)	3.353*** (0.703)	2.293 (1.673)	2.519 (1.684)
PC*Class(Complex)	0.094 (0.053)	0.082 (0.049)	0.067 (0.049)	0.097 (0.058)	0.086 (0.053)	0.070 (0.053)
PC*Class(Dual)	0.121* (0.058)	0.064 (0.058)	0.074 (0.054)	0.137* (0.062)	0.072 (0.064)	0.083 (0.060)
PC*Class(Other)	-0.536** (0.194)	-0.538* (0.213)	-0.533* (0.211)	-0.574** (0.197)	-0.565** (0.214)	-0.559** (0.212)
PC*Class(Foreign)	-0.375** (0.119)	-0.188 (0.110)	-0.171 (0.104)	-0.395** (0.120)	-0.196 (0.111)	-0.179 (0.105)
Constant	2.557*** (0.136)	4.917*** (0.577)	4.520*** (0.630)	3.575*** (0.130)	5.566*** (0.576)	5.157*** (0.629)
Controls for x	No	Yes	Yes	No	Yes	Yes
Ethnic FE	No	Yes	Yes	No	Yes	Yes
Region FE	No	No	Yes	No	No	Yes
R^2	0.158	0.303	0.312	0.157	0.303	0.311

*p<0.05, ** p<0.01, *** p<0.001; n= 8,994. No religion collected in the survey

Base for interaction and categorical results- Wealth Distinctions ethnic group

the country level mobility matrices with those of the ethnic classifications. Greater mobility indicator values indicate higher mobility and the results show that for the anglophone countries, the D classification has higher levels of mobility than the country average and other ethnic classification, and this result is particularly so for the Eigen value mobility measure. The reverse is true for the francophone countries. The extent of the variance is different for the countries but by and large, there are minor differences in pattern between the countries at the national level. The results from the mobility estimates also reinforce findings from the regression model that D is more mobile in comparison to other classifications in anglophone countries than in francophone countries.

The transition matrices which show the education attainment of children given their parents education are illustrated in Figures 7-10. I focus on countries for which the interactions were significant though the full transition tables are presented in the appendix. For Ghana, the regions of significance were identified to be at lower levels of parental education and as can be seen in Figure 7, there is a higher proportion of parents with no education and whose children also have no education in the AF group, compared to the national average and the D group. A higher proportion of children in the D group have secondary or more despite having parents with no or primary education. This is indicative of the findings from the regression results that the D group has higher levels of mobility than AF. For Madagas-

Table 10: Summary Mobility Matrices - Rigid Pre-colonial Societies

Children and Parents Education (Categorical)								
	GHANA			NIGERIA				
	Country	Freemen	Dual	Country	Freemen	Wealth D.	Complex	Dual
MB _S	0.728*** (0.006)	0.706*** (0.018)	0.764*** (0.009)	0.698*** (0.010)	0.731*** (0.016)	0.755*** (0.022)	0.714*** (0.011)	0.809*** (0.029)
MB _B	0.236*** (0.002)	0.232*** (0.007)	0.249*** (0.003)	0.219*** (0.003)	0.227*** (0.005)	0.235*** (0.007)	0.236*** (0.005)	0.269*** (0.010)
MB _E	0.942*** (0.009)	0.447* (0.221)	0.949*** (0.120)	0.430*** (0.009)	0.471*** (0.015)	0.593*** (0.154)	0.888*** (0.166)	0.925*** (0.123)
MB _D	0.992*** (0.001)	0.991*** (0.005)	0.995*** (0.002)	0.985*** (0.002)	0.992*** (0.004)	0.992*** (0.004)	0.985*** (0.003)	0.996*** (0.003)
N	27115	5796	12398	12603	2450	2663	2604	700
	MADAGASCAR			NIGER				
	Country	Freemen	Dual	Country	Freemen	Complex	Dual	Foreign
MB _S	0.746*** (0.010)	0.783*** (0.025)	0.719*** (0.011)	0.700*** (0.019)	0.699*** (0.024)	0.759*** (0.033)	0.459*** (0.070)	0.801*** (0.070)
MB _B	0.244*** (0.004)	0.260*** (0.012)	0.231*** (0.005)	0.200*** (0.007)	0.196*** (0.009)	0.229*** (0.012)	0.113*** (0.017)	0.227*** (0.024)
MB _E	0.472*** (0.010)	0.543*** (0.027)	0.426*** (0.011)	0.387*** (0.017)	0.373*** (0.024)	0.427*** (0.021)	0.158 (0.294)	0.953*** (0.195)
MB _D	0.994*** (0.001)	0.997*** (0.002)	0.993*** (0.002)	0.997*** (0.002)	0.996*** (0.003)	0.999*** (0.002)	0.941*** (0.041)	1.000*** (0.003)
N	21517	5187	9565	8994	5448	2452	886	199

MB_S = Shorrock/ Prais index; MB_B=Bartholomew; MB_E=1-Second largest eigenvalue; MB_D = Determinant index
Standard errors in parentheses

Table 11: Summary Mobility Matrices - Fluid Pre-colonial societies

Children and Parents Education (Categorical)								
	MALAWI			GUINEA				
	Country	Freemen	Dual	Country	Freemen	Wealth D.	Dual	Foreign
MB _S	0.735*** (0.012)	0.730*** (0.012)	0.821*** (0.033)	0.835*** (0.010)	0.933*** (0.074)	0.831*** (0.026)	0.795*** (0.024)	0.879*** (0.020)
MB _B	0.209*** (0.003)	0.206*** (0.003)	0.247*** (0.011)	0.296*** (0.005)	0.376*** (0.056)	0.308*** (0.015)	0.287*** (0.011)	0.318*** (0.008)
MB _E	0.536*** (0.140)	0.527*** (0.154)	0.674*** (0.137)	0.511*** (0.012)	0.950*** (0.135)	0.537*** (0.045)	0.494*** (0.032)	0.658*** (0.027)
MB _D	0.990*** (0.002)	0.989*** (0.002)	0.998*** (0.002)	1.000*** (0.000)	1.000*** (0.006)	1.000*** (0.000)	1.000*** (0.001)	1.000*** (0.000)
N	21066	17756	1830	13016	377	4194	3243	2177

MB_S = Shorrock/ Prais index; MB_B=Bartholomew; MB_E=1-Second largest eigenvalue; MB_D = Determinant index
Standard errors in parentheses

car which had regions of significance at higher levels of parental education, in Figure 8, our results are reversed. We see that a higher proportion of children in D have similar attainment to their parents as compared to those in AF for whom higher proportion of children have low education attainment. In essence, the higher persistence observed among the D compared to the AF group is explained by the difference in proportion of their children who end up with no education. For Malawi, more of the D group children have higher education than their parents compared to the AF group. Very high levels of transitions are observed among the foreign group as well (see figure 9). In Nigeria, the interaction was significant for the D group and we can see they have lower proportion of children who remain in the same education

level as their parents. In comparison, and in line with observations made earlier for Nigeria in Figure 5, we see in Figure 10 higher levels of children remaining in the same education category as their parents for the WD group, and evidence of downward mobility. Overall, our transition matrices show differences in within group (historical classification) patterns of education attainment for the children, which are masked by national level analysis, and are in line with the findings from the regression results.

Figure 7: Education Transition Matrices -Intergenerational Transmission of education in Ghana

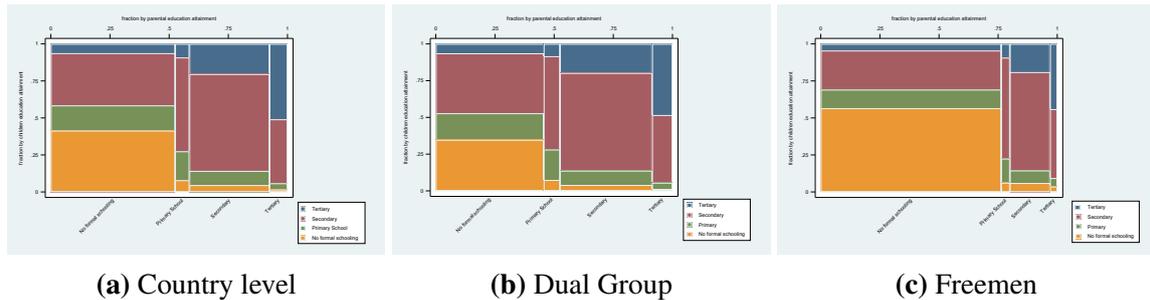


Figure 8: Education Transition Matrices -Intergenerational Transmission of education in Madagascar

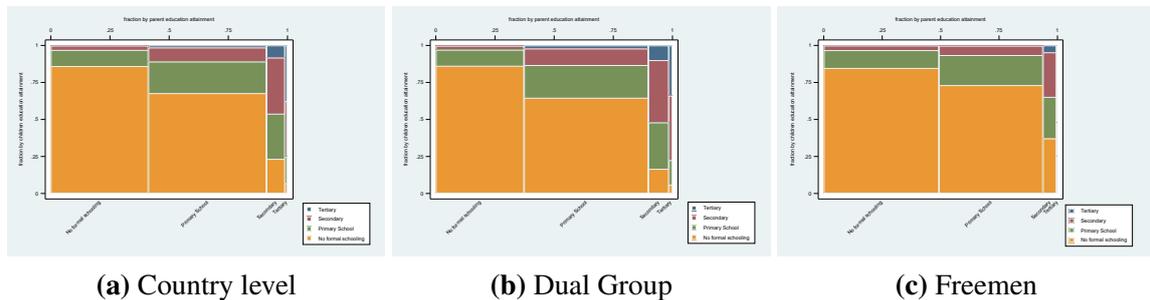
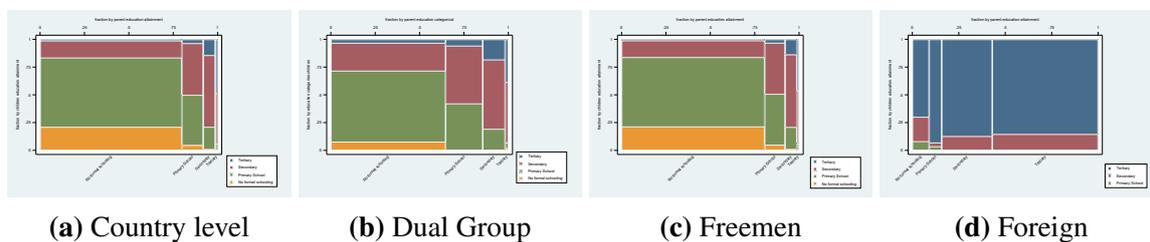


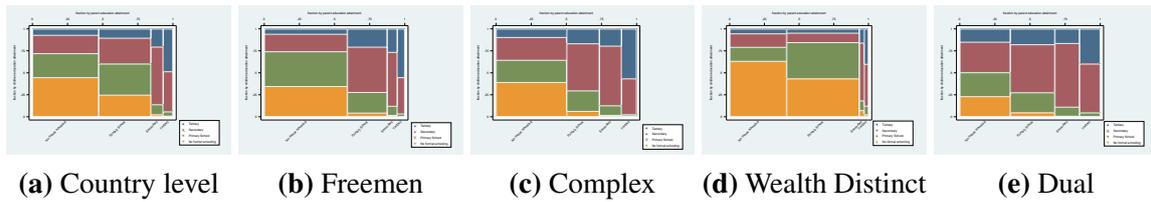
Figure 9: Education Transition Matrices -Intergenerational Transmission of education in Malawi



4.1 Additional Tests and Robustness Checks

To check the robustness of our results, we focus on only fathers and sons. We find similar results in that there are significant differences in persistence between the ethnic groups

Figure 10: Education Transition Matrices -Intergenerational Transmission of education in Nigeria



5 Conclusion

This paper sets out to determine the extent of historical persistence by examining differences in intergeneration transmission of education between ethnic groups based on the historical class stratification system in existence. Because there were no states in that period, these ethnic groups were representative of incipient whole societies and by creating national boundaries which included different types of societies, and given the salience of ethnicity for Africa, this presents an opportunity for the analysis of how these structures have evolved in the contemporary period. The results show that there are statistically significant differences in persistence in three of the six countries. These are Madagascar, Malawi and Nigeria. In Guinea and Niger, there are no significant differences in persistence between groups. This may be as a result of the assimilation policy followed during the colonial period by the French administration. In Ghana, there are significant differences in persistence until religion of the individuals is controlled for. This may be indicative of the equalizing role of religion in increasing access to education for the country.

Generally, the results point to differences in evolution of historical persistence between anglophone and francophone countries. We see that in anglophone countries, dual groups are more mobile than the other historical classification but they are less mobile in francophone countries. A key factor that could have led to this is the variation in education policy and implementation in the immediate post independence period. In most anglophone countries, the post independence period was characterised by expansion of education access even though it stalled in the 1970 to 1980 period. In comparison, in francophone countries, education access was expanded but not enforced to the same extent and historical rigidities seem to have persisted unchanged within the different classifications. What we cannot identify from our results is whether the anglophone countries education expansion led to the development of rigidities among the fluid groups leading to them having less mobility or whether there were fundamental changes to the structure of rigid historical societies which has led to increased mobility. Nevertheless, the results challenge the notion of uniformity in institutional lock-in amongst African countries.

Appendix

Mobility Matrices Specification

The specification of these commonly used mobility matrices are presented as follows ([Aebi et al., 2006](#)):

The Prais index:

$$\frac{K - \text{tr}(P)}{K - 1} \quad (2)$$

The Eigen value index:

$$1 - \delta(P) \quad (3)$$

The Bartholomew index:

$$\sum_{i=1}^K \pi(i) \sum_{j=1}^K P(i, j) |i - j| \quad (4)$$

The Determinant index:

$$1 - \det(P) \quad (5)$$

In all these equations, P refers to the irreducible transition matrix, π is the invariant distribution of P , $\delta(P) = \max|\lambda| : \lambda \in \rho(P)$ and $\lambda \neq 1$ The indices i and j always denote generic states running from 1 to K .

Table 12: Transition Matrices - Ghana

	Education of offspring (Highest level of education)							
	None	Primary	Secondary	Tertiary	None	Primary	Secondary	Tertiary
Father education								
	Country estimates				Freemen			
None	0.4136	0.1705	0.3528	0.0630	0.5649	0.1260	0.2639	0.0452
Primary	0.0785	0.1955	0.6338	0.0922	0.0618	0.1630	0.6821	0.0931
Secondary	0.0457	0.0958	0.6544	0.2041	0.0598	0.0849	0.6643	0.1910
Tertiary	0.0159	0.0423	0.4322	0.5097	0.0361	0.0574	0.4655	0.4411
	Dual				Other ethnic groups			
None	0.3468	0.1808	0.4080	0.0644	0.4250	0.1799	0.3246	0.0705
Primary	0.0738	0.2071	0.6348	0.0842	0.0922	0.1803	0.6196	0.1079
Secondary	0.0397	0.0973	0.6648	0.1982	0.0549	0.0951	0.6316	0.2183
Tertiary	0.0126	0.0423	0.4606	0.4845	0.0188	0.0401	0.3755	0.5657

Both male and female offspring included in analysis

Table 13: Transition Matrices - Nigeria

	Education of offspring (Highest level of education)							
	None	Primary	Secondary	Tertiary	None	Primary	Secondary	Tertiary
Father education								
	Country estimates				Freemen			
None	0.4472	0.2726	0.2091	0.0712	0.3463	0.3955	0.1988	0.0593
Primary	0.2481	0.3537	0.2942	0.1040	0.0443	0.2348	0.5151	0.2059
Secondary	0.0235	0.1151	0.6557	0.2057	0.0180	0.1034	0.6135	0.2651
Tertiary	0.0094	0.0482	0.4569	0.4855	-	0.0338	0.4131	0.5531
	Wealth Distinctions				Complex			
None	0.6328	0.1592	0.1537	0.0544	0.3927	0.2518	0.2600	0.0956
Primary	0.4329	0.4127	0.1074	0.0471	0.0636	0.2326	0.5361	0.1676
Secondary	0.0721	0.1109	0.6571	0.1599	0.0183	0.1083	0.6789	0.1945
Tertiary	0.0238	0.0996	0.4764	0.4003	0.0100	0.0147	0.4087	0.5666
	Dual				Other ethnic groups			
None	0.2308	0.2723	0.3472	0.1497	0.4241	0.3139	0.2026	0.0594
Primary	0.0464	0.2285	0.5468	0.1782	0.1737	0.4331	0.3038	0.0895
Secondary	0.0082	0.1033	0.7245	0.1640	0.0137	0.1600	0.5839	0.2424
Tertiary	-	0.0460	0.5554	0.3986	0.0098	0.0876	0.5167	0.3859

Both male and female offspring included in analysis

Table 14: Transition Matrices - Niger

	Education of offspring (Highest level of education)						Education of offspring (Highest level of education)				
	None	Primary	Middle	Secondary	Tertiary		None	Primary	Middle	Secondary	Tertiary
Father education											
	Country estimates						Wealth Distinct				
None	0.6281	0.3159	0.0431	0.0074	0.0056	0.6163	0.3334	0.0391	0.0066	0.0046	
Primary	0.1714	0.5279	0.2121	0.0591	0.0295	0.1555	0.5618	0.2173	0.0497	0.0156	
Middle	0.1530	0.2895	0.3549	0.1108	0.0919	0.2009	0.2492	0.3899	0.0799	0.0800	
Secondary	0.0582	0.0951	0.4437	0.2472	0.1558	0.0942	0.0514	0.5138	0.1988	0.1417	
Tertiary	0.0121	0.0729	0.2680	0.2530	0.3941	-	0.1035	0.2468	0.3038	0.3459	
	Complex						Dual				
None	0.6869	0.2405	0.0575	0.0084	0.0066	0.5939	0.3656	0.0326	0.0038	0.0040	
Primary	0.2264	0.4316	0.1770	0.0874	0.0776	0.1381	0.5319	0.2711	0.0512	0.0077	
Middle	0.0885	0.3139	0.2904	0.1739	0.1334	0.0785	0.2605	0.4614	0.1674	0.0322	
Secondary	-	0.1663	0.3837	0.3292	0.1208	-	-	0.2529	0.4943	0.2529	
Tertiary	0.0354	0.0377	0.3423	0.2046	0.3799	-	-	0.0611	0.0277	0.9113	
	Foreign										
None	0.2714	0.3912	0.1056	0.1197	0.1121						
Primary	0.1808	0.4149	0.3161	0.0882	-						
Middle	0.0290	0.6712	0.2676	0.0322	-						
Secondary	-	0.3535	0.2374	0.1187	0.2904						
Tertiary	-	0.0637	0.2282	0.2802	0.4280						

Both male and female offspring included in analysis

Table 15: Transition Matrices - Guinea

	Education of offspring (Highest level of education)						Education of offspring (Highest level of education)				
	None	Primary	Middle	Secondary	Tertiary		None	Primary	Middle	Secondary	Tertiary
Father education											
	Country estimates						Freemen				
None	0.7632	0.0932	0.0674	0.0436	0.0325	0.7612	0.1143	0.0846	0.0350	0.0049	
Primary	0.3303	0.2528	0.1838	0.1458	0.0873	0.7206	0.2192	0.0602	-	-	
Middle	0.2818	0.2011	0.2662	0.1735	0.0775	0.3345	0.4414	0.1512	0.0328	0.0402	
Secondary	0.1987	0.2316	0.1951	0.2729	0.1017	1.0000 ^o	-	-	-	-	
Tertiary	0.1344	0.1318	0.3036	0.2879	0.1423	0.0330	0.1974	0.5699	0.0729	0.1267	
	Wealth Distinct						Dual				
None	0.8044	0.0950	0.0615	0.0237	0.0154	0.8644	0.0528	0.0461	0.0246	0.0121	
Primary	0.4011	0.3252	0.1481	0.0604	0.0653	0.5199	0.1820	0.1680	0.1218	0.0082	
Middle	0.3642	0.2876	0.2180	0.1131	0.0170	0.3902	0.2204	0.2510	0.0925	0.0458	
Secondary	0.3933	0.2664	0.0933	0.2004	0.0467	0.1857	0.1197	0.2207	0.3915	0.0823	
Tertiary	0.3359	0.0922	0.1475	0.3496	0.0748	0.1645	0.0730	0.2847	0.2046	0.2733	
	Foreign						Others				
None	0.5072	0.1428	0.0947	0.1159	0.1394	0.7015	0.1149	0.0864	0.0615	0.0357	
Primary	0.2839	0.2309	0.1307	0.1942	0.1603	0.1815	0.2267	0.2707	0.2204	0.1008	
Middle	0.1395	0.1637	0.3070	0.2760	0.1138	0.2735	0.1560	0.2782	0.1900	0.1024	
Secondary	0.1028	0.1338	0.2429	0.3505	0.1700	0.2446	0.3739	0.1624	0.1564	0.0627	
Tertiary	0.0855	0.1158	0.2763	0.3608	0.1617	0.1064	0.1781	0.3883	0.2179	0.1093	

Both male and female offspring included in analysis, ^o only one father had secondary education

Table 16: Transition Matrices - Malawi

	Education of offspring (Highest level of education)							
	None	Primary	Secondary	Tertiary	None	Primary	Secondary	Tertiary
Father education	Country estimates				Freemen			
None	0.2099	0.6248	0.1533	0.0120	0.2140	0.6244	0.1507	0.0109
Primary	0.0463	0.4519	0.4661	0.0357	0.0495	0.4579	0.4604	0.0322
Secondary	0.0092	0.2013	0.6461	0.1435	0.0097	0.1996	0.6534	0.1373
Tertiary	0.0040	0.0557	0.4549	0.4854	0.0031	0.0609	0.4717	0.4642
	Dual				Foreign			
None	0.0774	0.6391	0.2508	0.0327	-	0.0808	0.2200	0.6993
Primary	0.0023	0.4190	0.5206	0.0581	-	0.0348	0.0348	0.9304
Secondary	0.0033	0.1887	0.6251	0.1828	-	-	0.1271	0.8729
Tertiary	0.0204	0.0495	0.5442	0.3859	-	-	0.1456	0.8544
	Other							
None	0.2347	0.6233	0.1291	0.0129				
Primary	0.0624	0.4233	0.4763	0.0379				
Secondary	0.0134	0.3258	0.6200	0.0407				
Tertiary	-	0.0622	0.6293	0.3085				

Both male and female offspring included in analysis

Table 17: Transition Matrices - Madagascar

	Education of offspring (Highest level of education)							
	None	Primary	Secondary	Post-secondary	None	Primary	Secondary	Post-secondary
Father education	Country estimates				Freemen			
None	0.8551	0.1114	0.0318	0.0018	0.8440	0.1210	0.0337	0.0013
Primary	0.6662	0.2166	0.1014	0.0158	0.7325	0.1966	0.0670	0.0039
Secondary	0.2228	0.3000	0.3933	0.0839	0.3419	0.3028	0.3016	0.0538
Tertiary	0.0768	0.1636	0.4126	0.3469	0.2389	0.1814	0.2957	0.2840
	Dual				Other ethnic groups			
None	0.8564	0.1112	0.0293	0.0031	0.8653	0.1011	0.0331	0.0005
Primary	0.6284	0.2289	0.1205	0.0222	0.6783	0.2113	0.0961	0.0142
Secondary	0.1683	0.2969	0.4283	0.1065	0.2457	0.3038	0.3871	0.0634
Tertiary	0.0606	0.1431	0.4541	0.3422	0.0569	0.2200	0.3341	0.3890

Both male and female offspring included in analysis

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Table 18: Country Distribution of Ethnic Classes

COUNTRY NAME	Class Stratification System					Total	Society Composition		Type
	1(AF)	2 (WD)	3 (E)	4 (D)	5 (C)		Fluid	Rigid	
ALGERIA	1	4	6	1	1	13	6	7	1
ANGOLA	4	1	0	6	0	11	5	6	2
BENIN	3	0	0	3	0	6	3	3	2
BOTSWANA	2	0	2	0	0	4	2	2	2
BURKINA FASO	10	1	2	2	1	16	12	4	2
BURUNDI	0	0	0	0	2	2	2	0	1
CAMEROON	19	4	0	10	0	33	23	10	2
C.AFRICAN RE-PUBLIC	8	0	0	1	0	9	8	1	1
CHAD	5	0	0	6	0	11	5	6	2
CONGO	3	2	0	1	0	6	5	1	3
COTE D'IVOIRE	9	2	1	4	0	16	11	5	2
CONGO (DRC)	29	3	0	18	2	52	34	18	3
DJIBOUTI	0	2	0	0	0	2	2	0	1
EGYPT	0	2	1	0	1	4	3	1	1
EQUATORIAL GUINEA	2	1	0	1	0	4	3	1	1
ERITREA	2	1	3	0	1	7	4	3	1
ETHIOPIA	3	4	1	4	2	14	9	5	1
GABON	2	1	0	0	0	3	3	0	1
GAMBIA	1	0	0	2	0	3	1	2	3
GHANA	8	1	0	6	0	15	9	6	2
GUINEA	5	1	1	2	0	9	6	3	1
GUINEA-BISSAU	4	0	1	2	0	7	4	3	3
KENYA	14	4	1	3	0	22	18	4	2
LESOTHO	1	0	0	2	0	3	1	2	2
LIBERIA	5	2	0	1	0	8	7	1	1
LIBYA	0	1	2	1	0	4	1	3	1
MADAGASCAR	2	0	0	5	0	7	2	5	2
MALAWI	4	0	0	2	0	6	4	2	1
MALI	5	2	6	4	2	19	9	10	1
MAURITANIA	0	0	4	2	1	7	1	6	3
MOROCCO	1	4	0	0	1	6	6	0	1
MOZAMBIQUE	7	0	0	1	0	8	7	1	1
NAMIBIA	2	2	0	1	0	5	4	1	1
NIGER	0	2	5	5	1	13	3	10	2
NIGERIA	24	7	0	16	2	49	33	16	2
RWANDA	1	0	1	0	2	4	3	1	3
SENEGAL	4	0	0	5	1	10	5	5	1
SIERRA LEONE	2	1	0	1	0	4	3	1	3
SOMALIA	1	2	0	0	0	3	3	0	1
SOUTH AFRICA	1	3	1	6	0	11	4	7	2
SUDAN	17	9	3	4	3	36	29	7	1
SWAZILAND	0	0	0	1	0	1	0	1	2
TANZANIA	15	2	2	21	2	42	19	23	2
TOGO	6	0	0	6	0	12	6	6	2
TUNISIA	0	1	1	0	2	4	3	1	1
UGANDA	8	4	3	6	1	22	13	9	2
ZAMBIA	7	1	0	7	0	15	8	7	2
ZIMBABWE	1	0	1	1	0	3	1	2	2
TOTAL	246	77	48	170	28	569	351	218	

Class codes: 1= Absence among freemen, 2= Wealth distinctions, 3= Elite, 4 = Dual, 5=Complex
Ethnic society Codes: Fluid=Absence among freemen, Wealth distinctions, Complex; Rigid= Elite, Dual
Country society Composition: 1= Fluid society, 2= Rigid society, 3=Mixed society

Source: Authors computation from [Murdock \(1967\)](#); [Nunn \(2009\)](#); [Michalopoulos and Papaioannou \(2013\)](#)