

Descriptive Modeling of Intergenerational Persistence in Education and the Influence of Family Lineage Descent Systems in The Democratic Republic of Congo

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Abstract: This study investigates how family lineage descent groups influence the intergenerational transmission of education for the cohorts of 1940-1989 in the Democratic Republic of Congo (DRC). The study applies both transition matrix and intergenerational persistence (IGP) methods, using the father's years of schooling as a proxy for parental education. The findings suggest a pronounced steady persistence in education for the estimated mean regression coefficient over a period of 49 years. Moreover, results by gender indicate that intergenerational persistence in education has significantly decreased for males in recent cohorts but slightly increased for females. Furthermore, findings suggest that intergenerational persistence has been decreasing in matrilineal descent groups in recent cohorts while increasing for the patrilineal descent groups. The study gives a good sense of the relationship between family lineage descent and intergenerational transmission of education in DRC. In addition, it indicates that there is both substantial upward and downward intergenerational education mobility in the country.

Keywords: Cohort analysis, Family lineage descent groups, Intergeneration transmission of education, Inter-generational persistence (IGP) methods, The Democratic Republic of Congo (DRC), Transition matrix.

1. Introduction

The principle of equal opportunity that gives individuals the right to equivalent opportunities for education and employment regardless of gender or social origin has always been an area of concern since the formation of the Democratic Republic of Congo (DRC). Following independence in 1960, the education policy has centered on eradicating illiteracy and providing all children with access to quality primary, secondary, and tertiary education to give them the tools they need to be socially and economically successful. However, the outcomes have not always been as successful as expected. For example, educational achievement has been curtailed in the country, especially for females and for individuals living in disadvantaged rural communities (see Figure 1). Additionally, quality indicators have long shown conflicting trends. According to the current UNESCO Institute for Statistics estimates for the period from 1992-2014, only half of those enrolled in primary education made it to the end of the cycle, and of these, only 25 % were likely to enroll in secondary education.

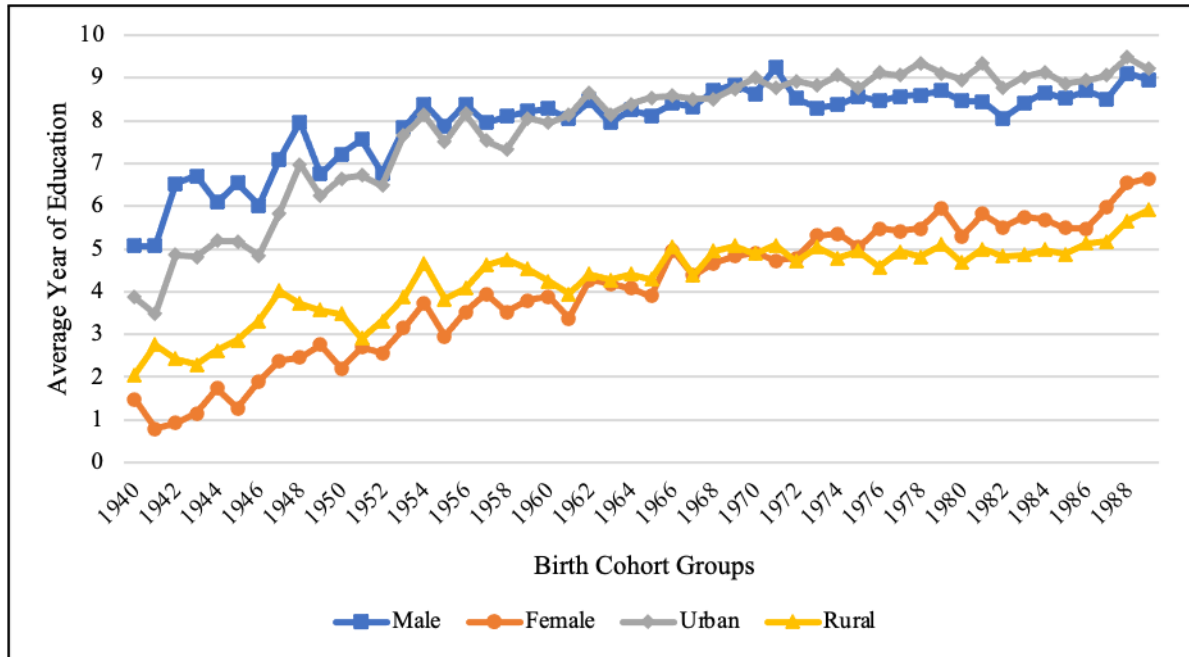


Fig.1 Average Year of Schooling by Gender & Place of Living in DRC (1940-1988) (Source: Created by the author based on 1-2-3 data (2012))

To overcome the problems that have hampered the development of education in the past and to revise both numerical targets and content, the DRC adopted a five-year plan for the development of primary, secondary, and vocational education (2010 - 2015). The first objective of the plan was the adoption of the Education Development Project (EDP), which was introduced in 2010 with the initial goal of gradually achieving universal primary education (UPE) by 2015. The goal was to develop a progressive UPE by first promoting compulsory and free primary education. This priority revolved around: (1) the gradual elimination of school fees, (2) the identification and integration of children excluded from the school system, (3) the reduction of geographical disparities and inequalities between gender, (4) increase of reception capacities, and (5) support to local communities for the development of preschool education with a view to facilitating the transition to primary education. The country had since revised its Education Sector Plan for 2016-2025 with a focus still on expanding access and equity, improving learning quality, and improving governance and management in the sector.

In an effort to reach the above goals, the DRC has invested considerable resources, 2% of GDP, to increase spending as well as access to education with promising results, albeit not to the same extent as the sub-Saharan average of 4% GDP. For example, from 2008 to 2013, important investments were made to expand the education system, resulting in a rapid increase in enrolments in all levels of education. More importantly, between 2008 and 2010, the number of public and private education institutions increased from 47,000 to 51,000, and the number of students registered across the system, from primary to secondary education, grew from 13.6 million to 14.6 million. Especially in 2014, gross enrolment rates in primary school reached 107 % and 40 % in secondary education.

In spite of this, keeping children in school, especially girls, has been and continues to be the greatest challenge. In the DRC, the survival rate to the last grade of primary education is of particular importance for monitoring universal primary education since it is a central objective of Education for All and the Sustainable Development Goal 4.1, which says that: “By 2030, ensure that all girls and boys complete free, equitable, and quality primary and secondary education leading to relevant and effective learning outcomes”. With this in mind, the Global Partnership for Education (GPE, 2018) considers that one of the main problems still to be addressed in the Congolese education system is a large number of out-of-school children and adolescents in the country. Despite decades of effort, however, if the Congolese people cannot be convinced of the value of schooling, the government may put as much money in education as they want, build more schools, even make them free, but people may still not choose to send their children to schools.

In order to overcome this inherent hesitancy towards schooling, exploring other causes of intergenerational low educational attainment in spite of easy, free access is necessary and would contribute to a more targeted policy formulation (Agupusi, 2019). In DRC, a possible factor explaining the low schooling rate over generations may be family lineage descent systems. The DRC is one of the most multi-ethnic countries in Africa, with an estimated population of more than 81.34 million (World Bank, 2017). Despite rapid urbanization and the predictions of modernization theory, family institutions continue to play a central role in the lives of the people. In other words, the country still harbors several hundred tribes that tie families together with common social, economic, religious, cultural, and language groups. As evidence, in Congolese societies, the lineage descending from a common and putative ancestor is often the invisible decision-making unit on matters of production, consumption, inheritance, child-rearing, succession, and authority (Richards, 1950; MacGaffey, 1983; Georgas, 2004). According to Lowes (2017), the DRC is an ideal place to examine the effects of family lineage descent on the intergenerational transmission of education because the country is at the intersection of what is known as the “matrilineal belt,” which describes the system of inheritance and the distribution of patrilineal and matrilineal ethnic groups across the central African region.

Although family lineage descent is an old topic, it is one that has been revitalized by theoretical and empirical progress in evolutionary anthropology (Strassmann & Kurapati, 2016). The topic is appropriate for the DRC simply because customary law or tribal law exists alongside the legal system in Congo, even though the DRC claims to be a country ruled by civil law. As an example, local customary laws are drawn on to regulate personal status such as marriage, and divorce, and also property rights, particularly regarding inheritance and land tenure systems, in the various traditional communities of the country. In the DRC, customary laws still settle 75% of the above-mentioned disputes (Zongwe et al., 2015). It is widely accepted that the country comprises no less than 450 distinct tribes, which make up the majority of its ethnic groups (Zongwe et al., 2015). These ethnic groups are then divided into family descent groups practicing either patrilineal, matrilineal, double, or bi-linear descent systems.

Lowes (2017) claims that the structure of kinship has important implications for the well-being of women and children in the country. In addition, studies over the past two decades have provided important information on family lineage descent. For instance, Caldwell & Caldwell (1987) assert that, where descent is patrilineal, societies may experience the persistence of high fertility even at the expense of a persistently high mortality rate. Another implication of the duty to ensure lineage survival observed in sub-Saharan Africa is the antipathy toward population policy, as men with a number of wives refuse to give them up. In addition, there is still sporadic coverage of family planning programs. All of these have serious consequences on the comparatively weak economic return expected from schooling. Contrary to this, it is interesting to note that other research on family lineage descent suggests that several features of matrilineal societies contribute to the economic and social security of women and children (Henn, 1984; Lowes, 2016; 2018). Although many social factors are consistent with results pointing to an emphasis on lineage orientation in sub-Saharan Africa, to date, there has been little empirical agreement on whether family lineage descent systems necessarily exert any fundamental or dominant influence on offspring schooling.

As argued earlier, understanding the extent to which education is transmitted across generations is especially important for this country, and this issue has received relatively little attention as well. Yet, as shown in Figure 2, our data confirm the claims noted by Lowes (2018). Our data expands on this, showing that in DRC, the higher the father’s education, the higher his son or daughter’s education is on average. However, there are many exceptions to this. For instance, perhaps because of ethnic group, kinship system affiliation, gender, or class standing at birth, some people in the country actually have little or no opportunity for education. In a study that documents intergenerational educational persistence in India, Hnatkovskay et al. (2013) found a decrease in intergenerational education attainment in the first wave of their data, but then a faster rise in the latter. Using multiple measures of intergenerational mobility and a pseudo panel for intergenerational education mobility over 50 years in 18 countries in Latin America, Neidhöfer et al. (2018) found that intergenerational mobility is, on average, rising. Although some research has been carried out on education persistence in other countries, there is still very little understanding of how educational attainment is transmitted across generations in DRC.

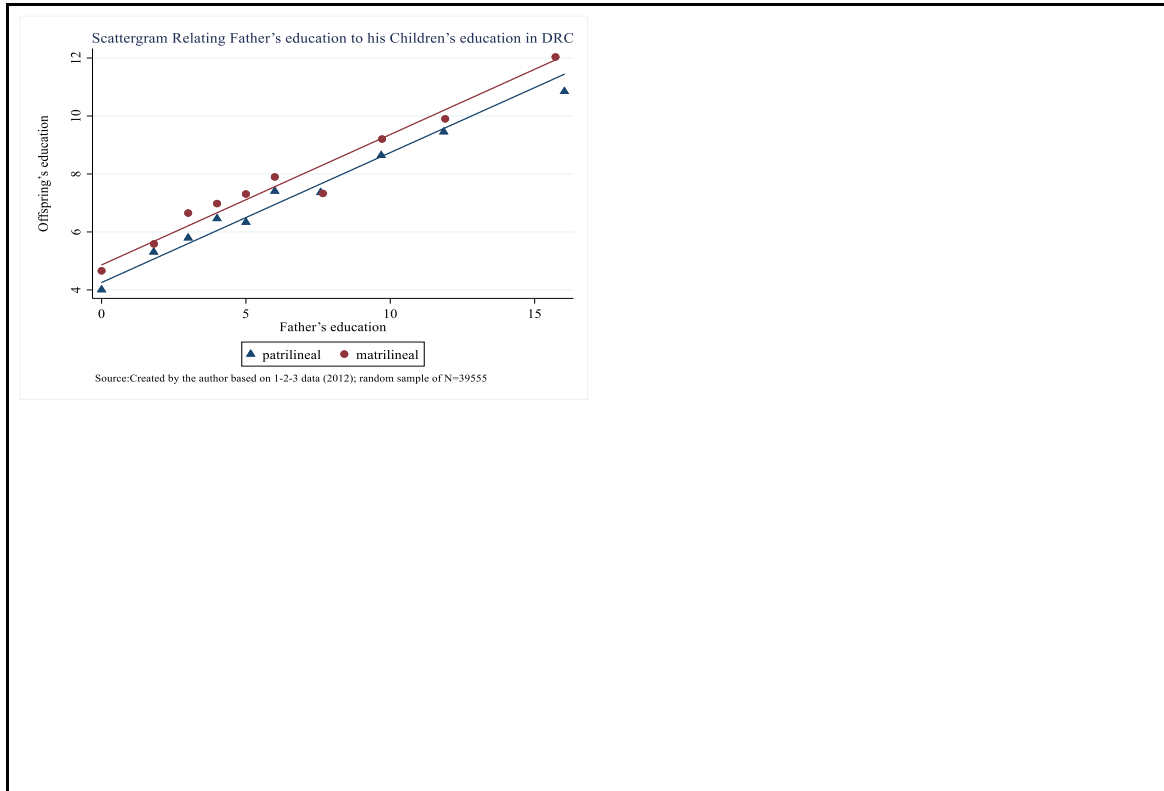


Fig. 2 Education Mobility for Individuals based on Father's Education in DRC by Family Descent Group (age 25 above)

Thus, this study explores the parental transmission of inequality by examining how family lineage descent systems influence the intergenerational transmission of schooling and how they contribute to socioeconomic mobility. Specifically, the study analyses the proportion of intergenerational persistence in education for the birth cohorts 1940 through 1989 in DRC. The study will also examine the proportion of intergenerational persistence in education between genders for the same birth cohorts and further assess the proportion of intergenerational persistence in education among lineage groups of the same (Lee, 2006; Damio, 2018)

2. Materials and Methods

2.1. Theoretical Framework

In this study, in order to make useful inferences about the exogenous variation in power within households, we take advantage of the fact that the country is at the intersection of what is known as the matrilineal belt, which describes the system of inheritance and distribution of patrilineal and matrilineal ethnic groups across the central African region. This is also important to understand how knowledge and materials are distributed at the household level and how the distribution of resources affects production, consumption, and other household outcomes. Anthropologists such as Fox (1934) and Goody (1975) have long studied the variation in lineage systems and the implications this has for societal and cultural outcomes. For instance, in patrilineal systems, a wife is effectively incorporated into the lineage of her husband, while in matrilineal systems, husbands and wives maintain strong allegiances with their own separate lineages. Consistent with the hypothesis that matrilineal systems reduce a husband's authority over his wife, as argued by Lowes (2016), and more importantly because, in families where women are key decision-makers, the proportion of resources devoted to children is far greater than those in which women have a less decisive role, family lineage descent may have important implications on intergenerational transmission of schooling. In addition, whether from a patrilineal or matrilineal system may have an effect on the number of out-of-school children, especially girls.

2.2. Empirical Models

The main variable of interest is an individual's educational attainment, which is measured as years of schooling. Because information on first-generation mother's schooling is not available in the data, only the father's years of schooling is used as a proxy for parental education in this study. To answer our research questions and test the hypothesis, this study has applied both the transition matrices and regression coefficient or intergenerational persistence (IGP) methods, which have traditionally been employed to assess intergenerational persistence in education. The following specification model was used:

$$educ_{ij} = \beta_0 + \beta_1 faeduc_{ij} + \beta_2 lineage_{ij} + \beta_3 X_i + \varepsilon_{ij} \quad (1)$$

Where $educ_{ij}$ is the level of education for individuals i in the household j , and $faeduc_{ij}$ refers to the level of education of parents (father). X_i Represents a vector of covariates for an individual i . $lineage_{ij}$ is a dummy variable indicating a matrilineal descent system. This study hypothesizes that overall, in the first analysis, intergenerational persistence in education has decreased for males in DRC through 1940-1989 birth cohorts. In the second analysis, disaggregating the data, intergenerational persistence has also decreased for both males and females in matrilineal descent groups through the same birth cohorts. This means that there is higher education mobility for males and females in the matrilineal group.

2.3. Data and Sampling Design

The data used in this study is from Survey 1-2-3 on employment, which is a repeated-cross sectional and retrospective survey on the informal sector and household living conditions collected in 2012. The survey was conducted by the Congolese National Institute for Statistics in partnership with other actors, including Afristat and the World Bank. The survey is nationally representative and multilayer that covers three nested surveys, three phases involving separate statistical populations. The data covered approximately 21,454 households, 111,679 individuals, and 8,727 informal production units. There are three distinct advantages in using the 1-2-3 survey data to examine family descent and intergenerational transmission of education. First, the data contains additional retrospective questionnaires. These questionnaires allow us to identify the father's education for each individual in the age group 25-72. Second, the data contains observations on actual years of schooling. In other words, having data on years of schooling avoids discontinuities in schooling distribution as a result of the imputation of years of schooling for the categorical variable measuring the level of schooling completed. Third, the data contains rich information about over 300 ethnic groups in DRC, which makes it easy to create the binary variable "matrilineal" equal to 1 if an ethnic group practices a matrilineal family lineage descent system and zero otherwise.

The focus of the present study is to empirically investigate the particular ways in which family lineage descent groups influence the intergenerational transmission of education in DRC. In order to achieve the above, the sample was reduced to 39,555 respondents comprising individuals born between 1940 and 1989. The cohort was then divided into five groups of nine years each (see Table 1). The data was also restricted to individuals who had completed their education, no longer studying, thus avoiding estimate bias.

Table 1. Summary statistics of main variables by birth cohort

Variable Definition of variables	1940-1949				1950-1959				1960-1969				1970-1979				1980-1989			
	M	SD	Min	Max	M	SD	Min	Max	M	SD	Min	Max	M	SD	Min	Max	M	SD	Min	Max
Dependent Variables																				
Offspring's years of education	4.07	4.72	0	19	5.56	5.08	0	21	6.14	5.10	0	21	6.67	5.10	0	21	6.89	5.06	0	21
Father's years of education	2.25	3.43	0	21	2.93	3.56	0	21	3.68	4.08	0	21	4.41	4.40	0	21	5.25	4.81	0	21
Kinship Systems																				
1 if descendant is traced through women lineage.	0.49	0.50	0	1	0.49	0.50	0	1	0.48	0.49	0	1	0.48	0.49	0	1	0.46	0.49	0	1
Other Individual Characteristics																				
1 if gender is female	0.51	0.50	0	1	0.47	0.49	0	1	0.50	0.50	0	1	0.50	0.49	0	1	0.55	0.49	0	1
Number of siblings	2.33	1.26	0	10	2.32	1.14	0	10	2.22	.93	0	10	2.19	1.00	0	10	2.17	1.28	0	10
Father's occupation																				
1 if executive	0.06	0.24	0	1	0.07	0.26	0	1	0.07	0.26	0	1	0.08	0.28	0	1	0.10	0.30	0	1
1 if qualified staff	0.23	0.42	0	1	0.24	0.42	0	1	0.25	0.43	0	1	0.24	0.43	0	1	0.23	0.42	0	1
1 if unskilled worker	0.09	0.29	0	1	0.10	0.29	0	1	0.08	0.27	0	1	0.07	0.26	0	1	0.06	0.25	0	1
1 if employer	0.02	0.14	0	1	0.01	0.12	0	1	0.02	0.15	0	1	0.02	0.16	0	1	0.02	0.16	0	1
1 if self-employed	0.53	0.49	0	1	0.53	0.49	0	1	0.52	0.49	0	1	0.52	0.49	0	1	0.54	0.49	0	1
1 if Paid domestic worker.	0.04	0.20	0	1	0.03	0.19	0	1	0.03	0.18	0	1	0.03	0.18	0	1	0.04	0.20	0	1
Household Characteristics																				
Household size	4.81	3.20	1	20	5.27	2.92	0	20	6.09	2.84	0	20	6.11	2.71	0	20	5.67	2.87	0	20
Area Characteristics																				
1 if lives in rural	0.61	0.48	0	1	0.64	0.47	0	1	0.62	0.48	0	1	0.59	0.49	0	1	0.59	0.49	0	1
District dummy																				
Kinshasa	0.14	0.34	0	1	0.11	0.31	0	1	0.13	0.34	0	1	0.14	0.34	0	1	0.13	0.34	0	1
Kongo Central	0.09	0.28	0	1	0.09	0.29	0	1	0.07	0.26	0	1	0.07	0.26	0	1	0.05	0.22	0	1
Mai-Ndombe	0.01	0.12	0	1	0.02	0.13	0	1	0.02	0.14	0	1	0.02	0.14	0	1	0.02	0.14	0	1
Kwilu	0.06	0.24	0	1	0.06	0.24	0	1	0.07	0.24	0	1	0.07	0.25	0	1	0.06	0.23	0	1
Kwango	0.03	0.17	0	1	0.03	0.16	0	1	0.03	0.17	0	1	0.03	0.16	0	1	0.02	0.15	0	1
Equateur	0.02	0.13	0	1	0.02	0.15	0	1	0.02	0.15	0	1	0.02	0.14	0	1	0.03	0.15	0	1
Sud-Ubangi	0.02	0.14	0	1	0.03	0.16	0	1	0.03	0.18	0	1	0.03	0.17	0	1	0.03	0.17	0	1
Nord-Ubangi	0.02	0.13	0	1	0.02	0.14	0	1	0.02	0.12	0	1	0.02	0.13	0	1	0.02	0.13	0	1
Mongala	0.01	0.10	0	1	0.01	0.10	0	1	0.01	0.11	0	1	0.01	0.11	0	1	0.01	0.11	0	1
Tshuapa	0.01	0.11	0	1	0.02	0.12	0	1	0.01	0.12	0	1	0.01	0.11	0	1	0.01	0.12	0	1
Tshopo	0.04	0.20	0	1	0.03	0.18	0	1	0.04	0.19	0	1	0.04	0.19	0	1	0.04	0.19	0	1
Bas-Uele	0.01	0.10	0	1	0.01	0.11	0	1	0.01	0.11	0	1	0.01	0.11	0	1	0.01	0.09	0	1
Haut-Uele	0.03	0.17	0	1	0.02	0.16	0	1	0.03	0.15	0	1	0.02	0.15	0	1	0.03	0.16	0	1
Ituri	0.03	0.18	0	1	0.04	0.19	0	1	0.04	0.19	0	1	0.03	0.17	0	1	0.04	0.18	0	1
Nord-Kivu	0.06	0.24	0	1	0.06	0.25	0	1	0.07	0.26	0	1	0.08	0.26	0	1	0.08	0.27	0	1
Sud-Kivu	0.07	0.26	0	1	0.07	0.26	0	1	0.06	0.24	0	1	0.07	0.26	0	1	0.08	0.26	0	1
Maniema	0.02	0.14	0	1	0.02	0.14	0	1	0.02	0.15	0	1	0.02	0.15	0	1	0.03	0.17	0	1
Lualaba	0.03	0.16	0	1	0.03	0.15	0	1	0.02	0.15	0	1	0.02	0.15	0	1	0.03	0.16	0	1
Haut-Lomami	0.03	0.18	0	1	0.03	0.18	0	1	0.04	0.18	0	1	0.03	0.17	0	1	0.03	0.17	0	1
Tanganyika	0.01	0.08	0	1	0.01	0.11	0	1	0.01	0.10	0	1	0.02	0.12	0	1	0.02	0.12	0	1
Haut-Katanga	0.06	0.24	0	1	0.07	0.25	0	1	0.06	0.23	0	1	0.06	0.24	0	1	0.06	0.24	0	1
Kasai-Oriental	0.04	0.18	0	1	0.03	0.16	0	1	0.03	0.16	0	1	0.03	0.16	0	1	0.03	0.16	0	1
Sankuru	0.02	0.12	0	1	0.01	0.12	0	1	0.02	0.13	0	1	0.02	0.13	0	1	0.02	0.14	0	1

Lomami	0.05	0.21	0	1	0.04	0.20	0	1	0.05	0.21	0	1	0.04	0.20	0	1	0.05	0.22	0	1
Kasai	0.02	0.14	0	1	0.03	0.16	0	1	0.03	0.15	0	1	0.03	0.16	0	1	0.02	0.15	0	1
Kasai-Central	0.04	0.18	0	1	0.04	0.18	0	1	0.03	0.18	0	1	0.03	0.18	0	1	0.03	0.17	0	1
<i>Quality of local educational facilities</i>																				
1 if went to public school	0.25	0.43	0	1	0.26	0.43	0	1	0.25	0.43	0	1	0.26	0.44	0	1	0.27	0.44	0	1
1 if denominational school	0.61	0.48	0	1	0.61	0.48	0	1	0.60	0.48	0	1	0.59	0.49	0	1	0.59	0.49	0	1
1 if went to private school	0.13	0.33	0	1	0.12	0.32	0	1	0.13	0.34	0	1	0.14	0.35	0	1	0.13	0.34	0	1
N	2,230				4,685				7,495				10,319				14,826			

Source: Author's estimation based on 1-2-3 data (2012)

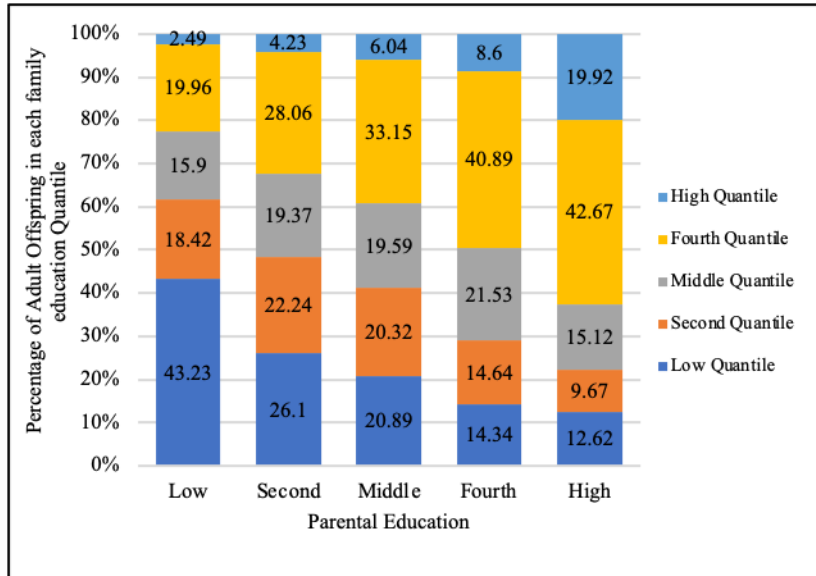


Fig.3 Transition Matrix for Chances of Getting Ahead or Falling Behind in Education by Parental Education (Aged 25 Above)

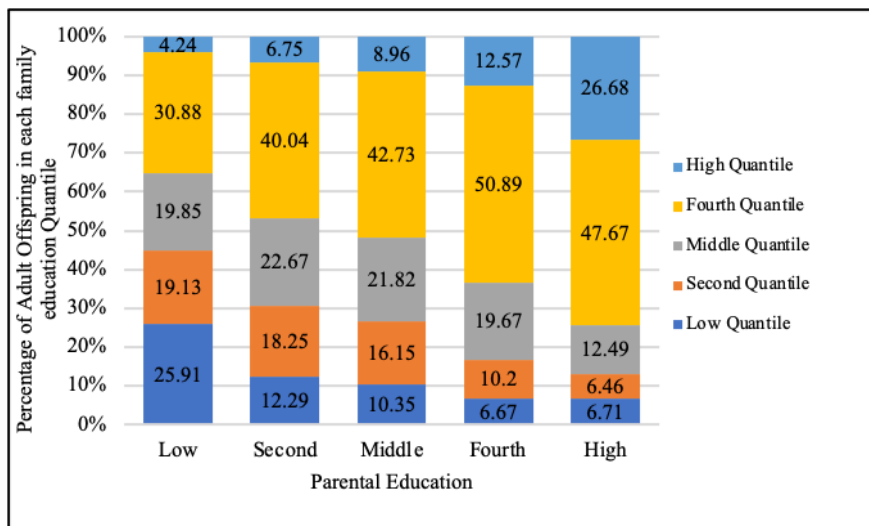


Fig. 4 Transition Matrix for Chances of Male Offspring Getting Ahead or Falling Behind in Education by Parental Education in DRC (Aged 25 Above)

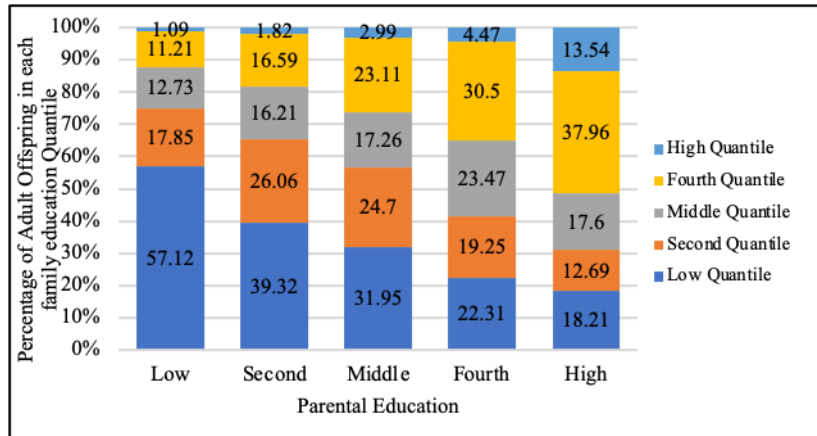


Fig.5 Transition Matrix for Chances of Female Offspring Getting Ahead or Falling Behind in Education in DRC (Aged 25 Above)

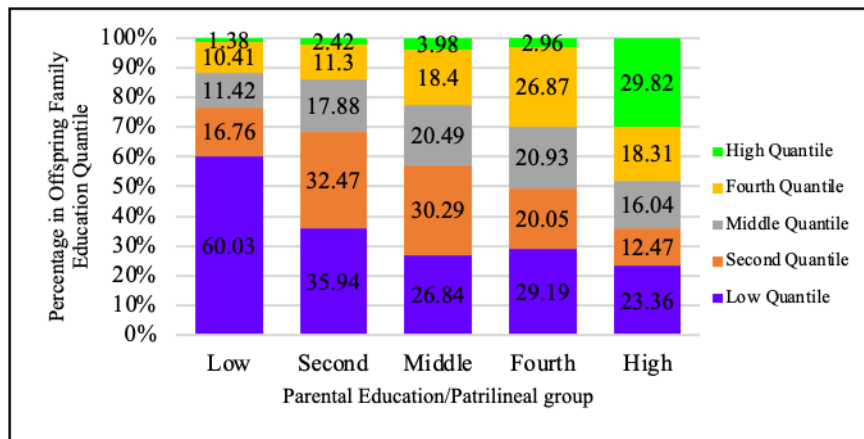


Fig. 6 Transition Matrix for Chances for Patrilineal Offspring Individual Getting Ahead or Falling Behind in Education (1940-1949)

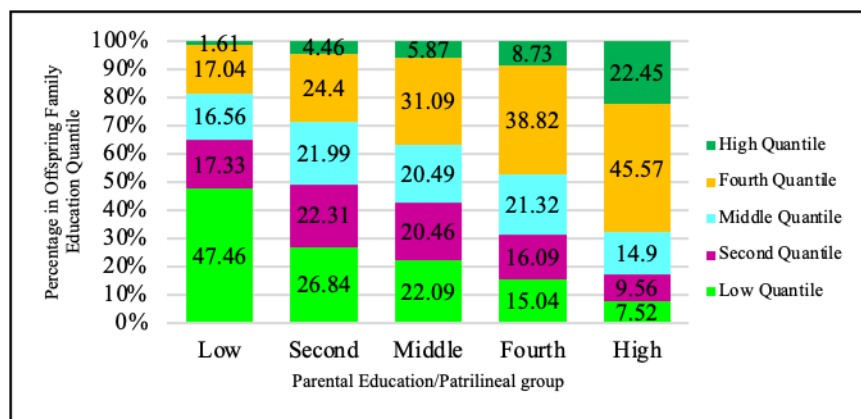


Fig. 7 Transition Matrix for Chances for Patrilineal Offspring Individual Getting Ahead or Falling Behind in Education (1980-1989)

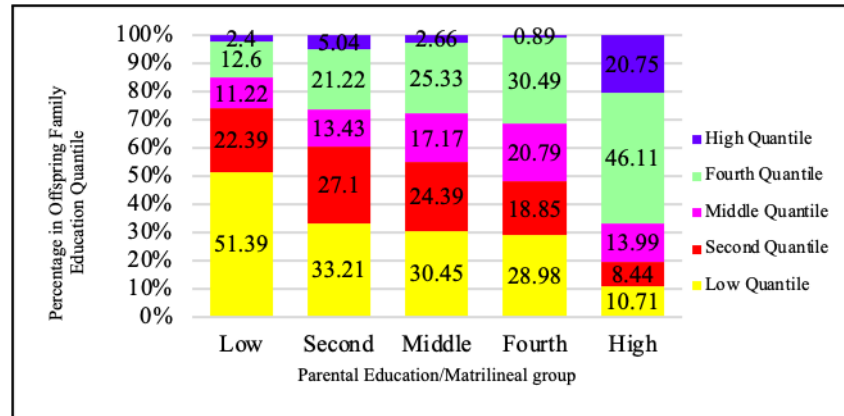


Fig. 8 Transition Matrix for Chances for Matrilineal Offspring Individual Getting Ahead or Falling Behind in Education (1940-1949)

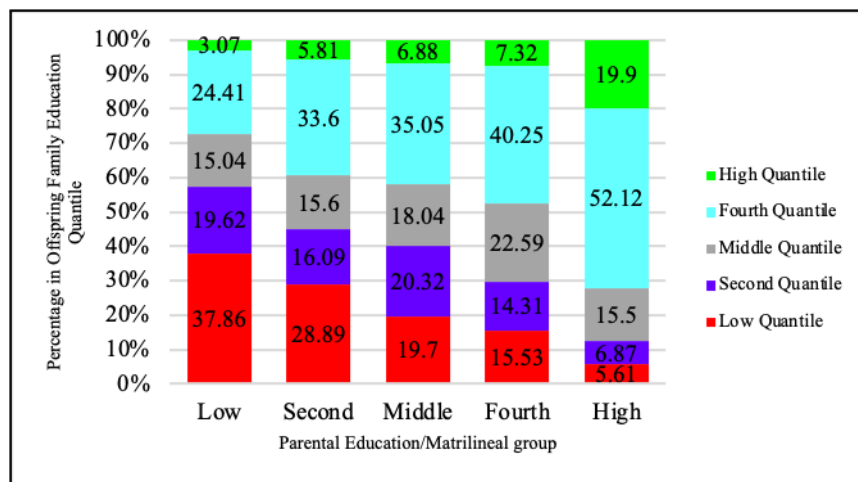


Fig. 9 Transition Matrix for Chances for Matrilineal Offspring Individual Getting Ahead or Falling Behind in Education (1980-1989) (Source: Author's estimation based on 1-2-3 data (2012))

3. Results

In this study, we explored the parental transmission of inequality by examining how family lineage descent systems influenced the intergenerational transmission of schooling and how they contributed to socioeconomic mobility for the birth cohorts 1940 through 1989 in DRC. With regard to transition matrices, Figure 3 reveals some interesting differences between father-to-offspring education mobility. The estimation indicates that, given a father in the lowest quintile, offspring have a greater than 43% chance of remaining in that quintile. While this education persistence is perhaps understandable here, it is also surprising to see the possibilities for large increases either upward or downward across this generational cohort. On the other hand, the intergenerational persistence of education from fathers' attainment in the highest quintile is less than 20%. Disaggregating by gender, Figure 4 shows that in DRC, given a father in the lowest quintile, male offspring have only a less than 26% chance of remaining in that quintile. In addition, the estimation in Figure 4 indicates that the intergenerational persistence for males in the highest quintile is less than 27%. However, Figure 5 indicates some interesting differences in the comparison of matrices for male and female offspring. Perhaps the most striking is the intergenerational persistence of educational attainment in the lowest quintile for females. In the DRC, given a father in the lowest quintile, the female offspring have a greater than 57% chance of remaining in that quintile. For males, the corresponding probability is less than 26%. In addition, the intergenerational persistence of educational attainment in the highest quintile for female offspring is actually much lower in DRC, only 13%, and yet for males, it is almost 27%.

Figures 6, 7, 8, and 9 give a comparison of matrices for individuals from patrilineal and matrilineal lineage descent in only two cohorts, the 1940 and the 1980. These figures indicate, for example, that in the 1940 cohort, individuals with a patrilineal father in the lowest quintile have a greater than 60% chance of remaining in that quintile (see Figure 6), compared to 47% for individuals with a patrilineal father in the 1980 cohort in the same quintile (see Figure 7). However, the intergenerational persistence of educational attainment in the highest quintile for individuals with a patrilineal descent father in the former cohort is 30% compared to 22% for individuals with a patrilineal father in the recent cohort. For individuals with matrilineal fathers in the former cohort, those in the lowest quintile have a greater than 51% chance of remaining in that quintile (see Figure 8) compared to 38% of individuals with a matrilineal father in the recent cohort (see Figure 9). However, the intergenerational persistence of educational attainment in the highest quintile for individuals with a matrilineal descent father in the former cohort is actually 21% compared to 20% for individuals with a matrilineal father in the recent cohort.

To get a better sense of the extent that parental education matters to the offspring's education in DRC, we employ an intergenerational persistence method (IGP). The baseline results in table 2 measure the persistence in education attainment for the five 9-year birth cohorts. In general, we observed a pronounced steady persistence in education for the estimated mean regression coefficient over a period of 49 years (1940-1989). More specifically, the results from table 1 indicate that a year difference in fathers' education is associated with a 0.491-year difference in offspring's education for individuals born between 1940 and 1949. Further, a year difference in fathers' education is associated with a 0.518-year difference for the cohort born during 1949-1959 and a 0.478-year difference in offspring's education for those born during 1960-1969, as well as 0.440 for those born during 1970-1979. In addition, a year difference in fathers' education was associated with 0.457 for individuals born between 1980 and 1989.

Other interesting results regarding intergenerational persistence in education by family descent groups and disaggregated by gender are shown in Tables 3 and 4. These results suggest more or less similar findings as those presented in Table 1. By way of example, the results by gender presented in table 2 indicate that intergenerational persistence in education has significantly decreased for males in recent cohorts but slightly increased for females. In particular, a year difference in fathers' education was associated with a 0.518-year difference in male offspring's education for individuals born between 1940 and 1949, compared to a 0.399-year difference in male offspring's education for individuals born between 1980 and 1989. By the same token, a year difference in fathers' education is associated with a 0.309-year difference in female offspring's education for individuals born between 1940 and 1949, compared to the 0.479-year difference in female offspring's education for individuals born between 1980 and 1989.

Accordingly, Table 4 indicates that intergenerational persistence has been decreasing for individuals from matrilineal descent groups in recent cohorts, while it has not changed significantly over the past 49 years for individuals in the patrilineal descent group in the same cohorts. For instance, a year difference in fathers' education is associated with a 0.475-year difference for individuals from the patrilineal descent group born between 1940 and 1949, compared to a 0.471-year difference for individuals from the patrilineal descent group born between 1980 and 1989. However, a year difference in fathers' education is associated with a 0.514-year difference for individuals from matrilineal descent groups born between 1940 and 1949, compared to a 0.433-year difference for individuals from the matrilineal descent group born between 1980 and 1989, a significant decrease in the matrilineal descent group.

Moreover, to capture the effect of other family background factors, a few variables used in the literature, such as number of children, family size, and father's proxy of socioeconomic status or place of living and quality of local educational facilities were also included with the district dummy in Table 5. The results show that the addition of these control variables significantly reduced the regression coefficients for intergenerational persistence in education in DRC compared to those presented in previous tables. It has also led to an important increase in the explanatory power of the regression. Despite the inclusion of such powerful control variables, the qualitative results remained unchanged; that is, parental education, shown as a proxy here by father's education, plays a vital role in children's educational attainment in DRC. For example, a year difference in the fathers' education is associated

with a 0.391-year difference for individuals from the matrilineal descent group born between 1940 and 1949, compared to a 0.232-year difference for individuals from the matrilineal descent group born between 1980 and 1989. However, a year difference in fathers' education is associated with a 0.297-year difference for individuals from patrilineal descent groups born between 1940 and 1949, compared to a 0.292-year difference for individuals from the patrilineal descent group born between 1980 and 1989 indicating the existence of education mobility in DRC and most easily recognized among individuals from matrilineal descent. It was surprising that even after using the district dummy, the father's occupation variables were still negatively predicting offspring schooling both in the former and recent cohorts. In addition, the quality of local educational facilities does not favour any school type, either in the former or recent cohorts. However, larger household size negatively predicted schooling in the former cohorts for individuals from both lineage descent groups.

Table 2. Estimates for Cohort Analysis of Intergenerational Persistence in Education Attainment in DRC.

Offspring birth cohort	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989
faeduc	0.491*** (0.0272)	0.518*** (0.0194)	0.478*** (0.0134)	0.440*** (0.0106)	0.457*** (0.00779)
_cons	2.963*** (0.112)	4.027*** (0.0896)	4.388*** (0.0735)	4.725*** (0.0659)	4.489*** (0.0555)
<i>N</i>	2230	4685	7495	10319	14826
adj. <i>R</i> ²	0.127	0.132	0.146	0.144	0.188

Source: Author's estimation based on 1-2-3 data (2012).

Standard errors in parentheses * Significant at 10%, ** Significant at 5%, *** Significant at 1

Note: Intergenerational persistence is the coefficient from the regression of children's years of schooling on parents' years of schooling. Greater persistence indicates lower relative intergenerational mobility.

Table 3. Estimates for Cohort Analysis of Intergenerational Persistence in Education Attainment in DRC by Gender

Offspring birth cohort	1940-1949		1950-1959		1960-1969		1970-1979		1980-1980	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
faeduc	0.518*** (0.0361)	0.309*** (0.0295)	0.521*** (0.0252)	0.430*** (0.0230)	0.420*** (0.0176)	0.449*** (0.0175)	0.394*** (0.0143)	0.464*** (0.0140)	0.399*** (0.0109)	0.479*** (0.0103)
_cons	5.124*** (0.163)	1.168*** (0.108)	6.126*** (0.120)	1.947*** (0.102)	6.421*** (0.103)	2.702*** (0.0893)	6.471*** (0.0904)	3.115*** (0.0861)	6.200*** (0.0800)	3.241*** (0.0715)
<i>N</i>	1096	1134	2451	2234	3753	3742	5113	5206	6649	8177
adj. <i>R</i> ²	0.158	0.088	0.148	0.135	0.131	0.149	0.129	0.174	0.167	0.210

Source: Author's estimation based on 1-2-3 data (2012).

Standard errors in parentheses * Significant at 10%, ** Significant at 5%, *** Significant at 1

Table 4. Estimates for Cohort Analysis of Intergenerational Persistence in Education Attainment in DRC by Descent Group

Offsprin g birth cohort	1940-1949		1950-1959		1960-1969		1970-1979		1980-1989	
	Patriline al	Matriline al	Patriline al	Matriline al	Patriline al	Matriline al	Patriline al	Matriline al	Patriline al	Matriline al
faeduc	0.475*** (0.0359)	0.514*** (0.0411)	0.472*** (0.0273)	0.555*** (0.0275)	0.464*** (0.0187)	0.483*** (0.0191)	0.420*** (0.0146)	0.450*** (0.0152)	0.471*** (0.0107)	0.433*** (0.0114)
_cons	2.667*** (0.153)	3.248*** (0.163)	3.864*** (0.122)	4.211*** (0.132)	4.087*** (0.0986)	4.748*** (0.109)	4.285*** (0.0885)	5.229*** (0.0972)	4.202*** (0.0731)	4.880*** (0.0850)
<i>N</i>	1137	1093	2413	2272	3988	3507	5484	4835	8081	6745
adj. <i>R</i> ²	0.133	0.125	0.110	0.151	0.133	0.154	0.131	0.154	0.192	0.177

Source: Author's estimation based on 1-2-3 data (2012).

Standard errors in parentheses * Significant at 10%, ** Significant at 5%, *** Significant at 1

Table5. Estimates for Cohort Analysis of Intergenerational Persistence in Education Attainment in DRC by Descent Group

Offspring birth cohort	1940-1949		1950-1959		1960-1969		1970-1979		1980-1989	
	Patrilineal	Matrilineal	Patrilineal	Matrilineal	Patrilineal	Matrilineal	Patrilineal	Matrilineal	Patrilineal	Matrilineal
Faeduc	0.297*** (0.0598)	0.391*** (0.0542)	0.286*** (0.0376)	0.345*** (0.0396)	0.255*** (0.0259)	0.261*** (0.0286)	0.217*** (0.0205)	0.239*** (0.0193)	0.292*** (0.0151)	0.232*** (0.0147)
no_sibling	0.142 (0.181)	0.319* (0.159)	0.188 (0.146)	-0.111 (0.116)	-0.206* (0.0937)	-0.227* (0.101)	0.0457 (0.0928)	0.290*** (0.0760)	0.340*** (0.0698)	0.388*** (0.0627)
Hhsize	0.147* (0.0739)	-0.0537 (0.0694)	0.224*** (0.0596)	0.272*** (0.0556)	0.179*** (0.0343)	0.154*** (0.0401)	-0.0578 (0.0309)	-0.160*** (0.0347)	-0.135*** (0.0304)	-0.190*** (0.0304)
Father's occupation (Executive used as ref. group)										
Qualified staff	-1.121 (0.849)	-2.110* (0.884)	-1.309* (0.591)	0.0790 (0.575)	-0.241 (0.391)	-0.335 (0.425)	-0.824** (0.294)	-1.207*** (0.295)	-0.132 (0.271)	-0.987*** (0.220)
Unskilled worker	-1.208 (1.157)	-2.397* (1.046)	-2.420*** (0.715)	-0.713 (0.672)	-1.416** (0.480)	-1.036* (0.497)	-1.852*** (0.422)	-1.413*** (0.422)	-1.305*** (0.348)	-1.249** (0.421)
Employer	-0.345 (1.393)	-2.183 (1.797)	-2.231* (0.994)	-1.666 (0.906)	-0.506 (0.807)	-0.669 (0.686)	0.983 (0.526)	-1.529** (0.547)	-0.107 (0.512)	-2.000*** (0.412)
Self-employed	-1.674* (0.811)	-2.496** (0.890)	-2.370*** (0.588)	-1.444* (0.577)	-1.116** (0.385)	-0.977* (0.433)	-1.530*** (0.296)	-1.721*** (0.299)	-0.715** (0.260)	-1.581*** (0.236)
Paid domestic worker	-2.433** (0.917)	-3.128* (1.293)	-3.446*** (0.717)	-1.441 (0.943)	-1.142 (0.584)	-1.586* (0.740)	-1.795*** (0.449)	-1.120 (0.901)	-0.375 (0.358)	-2.244*** (0.528)
Quality of local educational facilities (Public school used as ref. group)										
Denominational school	0.153 (0.348)	-0.209 (0.371)	-0.145 (0.272)	-0.427 (0.282)	0.282 (0.186)	-0.228 (0.208)	-0.109 (0.165)	-0.237 (0.183)	-0.260 (0.140)	-0.425** (0.152)
Private school	1.257 (0.922)	-0.479 (0.724)	0.335 (0.540)	0.0657 (0.540)	0.821 (0.423)	-0.356 (0.443)	0.442 (0.320)	-0.615 (0.314)	0.0813 (0.266)	-0.394 (0.240)
Area Characteristics										
Rural	-1.136** (0.377)	-1.224** (0.464)	-1.433*** (0.342)	-2.105*** (0.321)	-2.712*** (0.228)	-2.960*** (0.247)	-2.814*** (0.190)	-2.902*** (0.218)	-2.841*** (0.157)	-3.036*** (0.174)
District dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
_cons	6.001*** (1.176)	6.316*** (1.012)	7.372*** (0.758)	6.857*** (0.700)	9.609*** (0.627)	9.236*** (0.508)	10.90*** (0.460)	10.85*** (0.394)	8.831*** (0.367)	9.939*** (0.310)
N	1137	1093	2413	2272	3988	3507	5484	4835	8081	6745
adj. R ²	0.256	0.199	0.270	0.278	0.330	0.324	0.325	0.324	0.339	0.340

Source: Author's estimation based on 1-2-3 data (2012).

Standard errors in parentheses * Significant at 10%, ** Significant at 5%, *** Significant at 1

4. Discussion

This study used transition matrices and a regression coefficient or intergenerational persistence method (IGP) to assess intergenerational persistence in DRC's education for a cohort of individuals born between 1940 and 1989. The findings suggest a pronounced steady persistence in education for the estimated mean regression coefficient over a period of 49 years (1940-1989). Moreover, the results by gender indicate that intergenerational persistence in education has significantly decreased for males in recent cohorts but slightly increased for females. Furthermore, the findings also show an intergenerational persistence trend that has been high and steadily increasing over time for individuals from patrilineal descent groups, but has been steadily decreasing for individuals in matrilineal descent groups in recent cohorts.

Intergenerational persistence refers to the coefficient of the regression of children's years of schooling on parents' years of schooling. Greater persistence indicates lower relative intergenerational mobility in education and vice versa. The findings of this study indicate that in DRC, parental years of schooling account for about 50% of the inequality in children's years of schooling. This result is similar to the work of Azomahou & Yitbarek (2016), who estimated a regional regression coefficient of 0.51 for Sub-Saharan Africa and Hertz et al. (2007), who estimated a global average of 0.42 for 42 countries. The findings of this study also suggest that in DRC, there is slightly higher education mobility for males and that the difference between male and female education mobility has been increasing over time in the general population. However, disaggregating the findings also suggests an increase in education mobility for individuals in matrilineal descent groups.

In support of the above findings, it is a fact that the DRC is at the intersection of what is known as the "matrilineal belt," which describes the system of inheritance and the distribution of patrilineal and matrilineal ethnic groups across the central African region as the source of exogenous variation in power within households, and also that a very large existing body of research on family lineage descent suggests that several features of matrilineal societies contribute to the economic and social security of women and children (Henn, 1984; Lowes, 2016; 2018). We can also claim consistency with the hypothesis that matrilineal systems reduce the authority of men over women (Lowes, 2016), and for this reason, in matrilineal societies, the expenditure share of items that are positively correlated with household welfare, such as healthy food and education are higher compared to households where women have more less power (Lefebvre and Merrigan, 1998).

Although much work remains to be done, both theoretical and empirical, evidence presented in this study suggests that lineage descent, taken as an exogenous variation in power within households, plays a crucial role in the intra-family distribution of resources.

5. Conclusion

While there has been substantial scientific interest in comparing intergenerational mobility across societies, only a few researchers have addressed the question of its determinants. In general, studies on intergenerational education mobility focus on the transmission of economic inequality and poverty. Studies on intergenerational education inequality, however, generally emphasize the transmission of abilities. This study provides new insights into the transmission of persistent social and cultural attitudes of indifference towards education. Moreover, the study has generated new evidence on whether family lineage systems and descent groups have any influence on intergenerational education mobility in DRC. The findings of this study indicate an interesting relationship between family lineage descent and intergenerational transmission of education in DRC. However, the findings also indicate that there is substantial upward as well as downward intergenerational education mobility in the country. For instance, individuals whose fathers have little education would be expected to have, on average, education similar to their fathers. However, a surprising proportion managed to achieve higher education. In contrast to this, individuals whose fathers have a lot of education one would expect would have achieved education at a similar level. However, a surprising proportion had less education than their fathers. In addition, individuals from matrilineal descent generally have more years of education relative to individuals from patrilineal descent in DRC. Future studies taking into account the effect of lineage descent on intra-household decision-making power for intergenerational persistence in education will need to be undertaken.

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