Intersectional Inequality in Education

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Abstract

Intersectional inequality – the notion that disparities run along the lines of combinations of salient social groups such as gender or ethnicity – has become an increasingly prominent concept in the social sciences. Yet, because of the number of possible combinations of groups, embedding intersectionality into the measurement of inequality has proven to be analytically complex. Hence there is little empirical research applying an intersectional framework to measure inequality. We incorporate intersectionality into the measurement of between-group inequalities in educational attainment using DHS data from 39 low- and middle-income countries and the United States. Using schooling ratios between lower and higher educated groups as an inequality measure, we show that the intersectional perspective unveils a lot of inequality that remains masked if gender and ethnicity are considered in isolation. Generally, intersectional inequality in education is driven more by ethnic inequality than gender inequality. Further, we develop a novel metric to evaluate the relevance of intersectionality compared to standard approaches of between-group inequality measurement. The new metric, Surplus Intersectionality, reveals substantial heterogeneity between countries in terms of how much intersectionality is present. While gender, ethnic and intersecting inequality all seem to be driven mainly by a country's average education level, this is not the case for Surplus Intersectionality.

JEL codes: I24, I32, J15, J16

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1 Introduction

Leave no one behind, the central principle of the 2030 Agenda for Sustainable Development, highlights that "barriers people face in accessing services, resources and equal opportunities are not simply accidents of fate or a lack of availability of resources, but rather the result of discriminatory laws, policies and social practices that leave particular groups of people further and further behind" (UNSDG, 2022). In other words, disadvantages occur not only for individuals but also for whole social groups, for instance, women or members of marginalized ethnic groups. These systematic disparities are not only problematic from the perspective of equality of opportunity, but they are detrimental to economic development on a broader scale (Ferreira et al., 2014; Marrero and Rodríguez, 2013). In response, economists increasingly apply the concept of horizontal inequality when measuring inequalities between social groups such as gender or ethnicity (Mancini et al., 2008).

At the same time, "intersectionality" has become something like a buzzword in the social sciences. The UN Sustainable Development Group states that identifying inequalities requires disaggregation that goes beyond gender, geography, and age and should occur in multiple and intersecting ways (UNSDG, 2022). The term *intersectionality* was coined by Crenshaw (1989) as a critical theoretical framework to describe the distinct discrimination faced by members on the "intersection" of social groups, such as black women in the United States (US). According to the framework, intersectional inequalities arise when disparities run along the lines of combinations of social groups such as gender and ethnicity and can therefore be viewed as an extension to the horizontal inequalities framework. However, intersectionality remains mostly exclusive to theory in the humanities and is only starting to gain traction in the quantitative social sciences. More specifically, there are only very few examples directly linking the concept of intersectionality to the measurement of group-based inequalities in low- and middle-income countries (see e.g., Kabeer and Santos, 2017; Lenhardt and Samman, 2015; UNESCO, 2022).

To fill this gap, our work seeks to reconcile the intersectionality framework with the measurement of horizontal inequalities. In particular, we document and analyze intersectional inequalities in educational attainment in low- and middle-income countries across the world and between groups within countries by combining gender and ethnicity to form intersecting groups. As long as educational outcomes differ systematically and substantially across social groups, the world is unlikely to succeed in "leaving no one behind," as stated by the Agenda 2030 and its Sustainable Development Goals (SDGs) (Stuart and Woodroffe, 2016). This paper hopes to provide an analytic framework to detect intersecting group-based inequalities to inform policy-making.

We analyze descriptively how educational attainment varies across different intersecting groups. To this end, we combine data from several rounds of the Demographic and Health Surveys (DHS) from 39 low- and middle-income countries from 1992 to 2019 and data from the US Current Population Survey (CPS) 2019, resulting in 2'689'289 individual observations. We construct an extensive data set for the analysis, splitting the data into three birth cohorts; until 1969, 1970-1989, and 1980. Compared to previous attempts to measure intersecting inequalities, e.g., by the World Inequality Database on Education (UNESCO, 2022), this approach allows us to identify time trends for people who went to school simultaneously, rather than comparing snapshots between different rounds of DHS. Further, we aggregate the data at the country level to obtain estimates of intersectional inequality.

Our primary measure of inequality is the ratio between the group with the lowest (most disadvantaged) and the group with the highest (most advantaged) average education. We focus on education mainly for analytical reasons because most poverty-related outcomes such

as income or wealth are hardly separable between members of the same household. Thus, measuring gender inequalities in these outcomes is not feasible. Meanwhile, education is an outcome that accrues entirely to the individual, allowing us to analyze gender differences in schooling.

We proceed as follows. First, we estimate horizontal inequalities between genders, ethnic groups, and the combination thereof, using inequality ratios between the least and most disadvantaged groups as an inequality measure. We find that intersectional inequality between ethnicity and gender differs significantly across countries and is greater than horizontal (non-intersectional) inequality by ethnicity and gender separately. Intersectional inequality is mainly driven by ethnic inequality and less by gender inequality since ethnic inequalities still tend to be more pronounced in many countries.

Second, we analyze the role of surplus intersectionality, a novel measure to quantify in which contexts intersectionality is particularly pronounced. To this end, we estimate how much inequality would arise if gender inequality were constant across all ethnic groups as a synthetic counterfactual. We compare this measure with the observed intersectional inequality. We find that in some countries intersectionality adds up to five percentage points of surplus intersectionality. Remarkably, for about a third of the countries in the sample, surplus intersectionality is negative, indicating less gender inequality in most advantaged/disadvantaged ethnic groups.

Third, we use simulated data to assess how sensitive our inequality ratio is, especially when the number of groups is large and sample size per group is small. This combination of unfavorable characteristics (many groups with few observations per group) is more likely to occur when applying an intersectional framework. The sensitivity analysis reveals that the inequality measures used for this study are somewhat affected by small sample size, the number of groups to be analyzed, and the distribution of observations across those groups. However, we find that these effects are far from explaining a large part of the variation we observe in the actual data.

Lastly, we use regression analysis to identify the main correlates of horizontal and intersectional inequality, analyzing the role of various group characteristics, the institutional setting, and economic performance. Regression analysis shows that intersectional inequality and horizontal inequality in education are highly associated with the general level of education. Countries with generally higher education attainment have lower group-based inequality by gender, ethnicity, and their intersection. Furthermore, the results are robust to controlling for sample size and the number of ethnic groups.

This paper contributes to various strands of literature touching on intersectional inequality. On a broader scope, this paper speaks to established theoretical literature in sociology, social psychology, and gender studies that conceptualized intersectionality theoretically. Kimberlé Crenshaw (1989) coined the term, and what followed was an ample discussion about the consequences of adopting an intersectional perspective not only for social sciences but also for public policy (Alexander-Floyd, 2012; Berger and Guidroz, 2010; Bowleg, 2008; Cho et al., 2013; Choo and Ferree, 2010; Few-Demo, 2014; Hancock, 2007; Shields, 2008; Strid et al., 2013; Walby et al., 2012, to name just a few examples). However, the cited works make little to no prescriptions of *how* intersectionality could be operationalized quantitatively. The paper at hand contributes to this literature by proposing a framework for how researchers could include intersectionality in the quantitative measurement of inequality.

Compared to the theoretical literature in the humanities, much less research explicitly applies an intersectional perspective to empirical research on any dimension of well-being. Recent literature addresses education inequality at the intersection of race and gender in the US. One strand of the literature examines the Black gender gap in college success (Keels,

2013; McDaniel et al., 2011; Mittleman, 2021), labor market returns to math performance (Riegle-Crumb, 2006), or success expectations in STEM-related subjects (Parker et al., 2020, review article). Together, the studies paint a clear picture regarding disparities in education at the intersection of race and gender in the US; Black women cannot fully profit from the closing overall gender gap in education. Yet, Black men are typically even worse off than black women. These effects are partly offset by socioeconomic status, especially for Black women (i.e., there is no gender gap for Black women with high socioeconomic status) (Keels, 2013). These findings highlight the importance of intersectionality as an analytical framework because they provide essential insights usually lost when considering social identities like race and gender in isolation. However, the methodological frameworks applied in the cited studies are not necessarily applicable to other countries where the concept of race and ethnic groups differs substantially from the US context.

In the non-US context, Sen et al. (2009) analyze the inequality in access to health treatment at the intersection of gender and social class in India. They find that the probability of non-treatment is only lower for women from poor households, while for men, being poor (or "lower class") is not a relevant factor. The authors model intersectionality as interaction terms in regressions and report the probability (odds ratio) of having a particular health-related outcome for members of a social group compared to a reference group. This method, however, limits the options to define intersectional inequality in a way that would apply to contexts where the social groups of interest differ.

Our study departs from this literature in several aspects. First, we explicitly relate our empirical analysis to the theoretical literature on intersectionality, which is not the case for most studies cited above. In our case, intersectionality is not merely meant as an afterthought but as an analytical lens through which to study inequalities. Second, we emphasize the measurement of inequality as an outcome. Using inequality ratios, we express inequality in one measure instead of inferring differences between the groups from regression analyses. This method allows us to define intersectional inequality as a universal measure, to be computed the same irrespective of the specific context. Third, we look beyond the US and focus on 39 low- and middle-income countries, which allows us to assess the relevance of intersectionality globally for a large part of the world's population.

Furthermore, this research integrates the concept of intersectionality into the growing literature on the measurement of horizontal inequality.[1] Shorrocks (1984) was among the first to propose the decomposition of inequality measures into population subgroups. This idea is mirrored in a growing body of research studying the concept of horizontal or between-group inequality.[2]

Most closely related, Tetteh-Baah (2019) analyzes inequality in various dimensions of well-being, but tends to focus on the grouping characteristics such as gender and ethnicity or religion in isolation. In contrast, we combine two social groups – gender and ethnicity – studied independently in much of the previous research and, by doing so, reconcile the measurement of horizontal inequality with the emerging empirical literature on intersectionality.

Another strand of the literature indirectly touches the topic by studying inequality of opportunity in developing countries (Ferreira et al., 2014; Brunori et al., 2019; Brunori and Neidhöfer, 2021). Notably, Brunori and Neidhöfer (2021) analyze inequality of opportunity in Germany by using machine learning techniques to determine "types" of individuals, i.e. factors that make a person relatively more or less advantaged. These types could therefore

[1] For literature on inequality in its "vertical" sense, see e.g., Piketty and Saez (2014) for the USA and Europe and Ravallion (2014) for developing countries.

[2] See e.g., Langer (2005), Langer et al. (2007), Mancini et al. (2008), Mancini (2008), Stewart (2009), Elbers et al. (2008), Cederman et al. (2011), Cederman et al. (2015), Canelas and Gisselquist (2018), Leivas and Dos Santos (2018), McDoom et al. (2019).)

be seen as a form of intersecting groups. Main difference to our approach is that they let the types be determined to obtain groups that are as different from each other as possible in terms of opportunity. Meanwhile, we focus on only two characteristics, gender and ethnicity, which allows us to make comparisons over time, and to a certain extent, across countries. [3]

To the best of our knowledge, there are only two examples that explicitly combine the measurement of horizontal inequality with intersectionality: First, Lenhardt and Samman (2015) analyze intersecting inequalities in education and child health in 16 low- and middle-income countries using DHS data. They find that intersecting inequalities exacerbate disparities to the degree that goes beyond the mere addition of the separate components. Second, the World Inequality Database on Education (WIDE) documents educational inequalities on an interactive online dashboard. It allows users to compare different countries (vertical), social groups within countries (horizontal), and overlapping disparities between these groups (intersecting) for various indicators based on data from DHS and Multiple Indicator Cluster Surveys (MICS) data. The possibilities of the dashboard are vast but limited in a few crucial aspects.

In our view, the main shortcoming of Lenhardt and Samman (2015) is that their study includes only data on women in the study. Second, both Lenhardt and Samman (2015) as well as WIDE use data that is not harmonized across survey rounds (particularly regarding ethnic groups), limiting the number of survey rounds that one can draw upon. Third, WIDE only displays group averages rather than actual measures of inequalities. Fourth, in Lenhardt and Samman (2015) and WIDE, there is no further analysis to evaluate the relevance of intersecting inequality compared to non-intersectional horizontal inequality.

We address these shortcomings in the following ways: We address the first point by analyzing data of women *and* men, which, in our opinion, is one of the most crucial dimensions to highlight. We address the second point by harmonizing the data on ethnic groups across DHS survey rounds, giving our data much more depth in terms of sample size and including birth cohorts. Moreover, we use cohort data to determine how inequality changes over time rather than measuring change between different rounds of data collection. Finally, we address the third point by measuring inequality ratios between the most and least disadvantaged groups regarding educational attainment. Compared to a Theil or Gini Index, this measure is intuitively simple and easy to interpret.

The remainder of this paper proceeds as follows. Section 2 introduces the concept of intersectional inequality. Section 3 describes the empirical strategy to estimate the intersectional inequalities and subsequent analysis. Section 4 presents more information on the data. Section 5 presents the results of the analysis. Section 6 concludes.

2 Theoretical framework

The most common concept of inequality measurement is "vertical inequality" (Bourguignon, 1979; Cowell, 1988; Lambert and Aronson, 1993). Vertical inequality typically measures inequality between individuals within or across geographic or economic entities. Some measures, such as the Gini coefficient or the Theil index, take the whole distribution of

[3] More remotely, our research ties to a broader literature on gender inequality and ethnic and religious inequalities in education in the Global South. For gender inequality in education, see e.g., King and Hill (1995), Lopus and Frye (2018), Klasen (2002), Klasen and Lamanna (2009). For ethnic and religious inequalities, see e.g., Easterly and Levine (1997), Montalvo and Reynal-Querol (2003), Montalvo and Reynal-Querol (2005), Alesina et al. (2016), Houle and Bodea (2017), Muller (2017), Alcorta et al. (2018), Cooray and Potrafke (2011), Hajj and Panizza (2009) All of this literature documents large and persisting (although somewhat declining) gaps in ethnic and gender inequality and finds detrimental effects of these inequalities to economic growth.

an outcome into account, while others, such as the Palma Index or the P90/P10 ratio, compare specific percentiles of the distribution. In contrast to vertical inequalities, horizontal inequalities occur between different social groups, such as gender, ethnicity, religion, or rural vs. urban population. They are, thus, often referred to as between-group inequalities (see Figure 1).

Moreover, there is a normative argument for horizontal inequalities being the source of injustices if they arise from social constructs, such as social groups. Since individuals have little (or no) influence over group membership like gender or ethnicity, systematic horizontal inequalities in education directly conflict with the equality of opportunity. Particularly considering the SDG mantra to "Leave no one behind," horizontal inequalities are a highly meaningful tool to guide anti-discrimination policy.

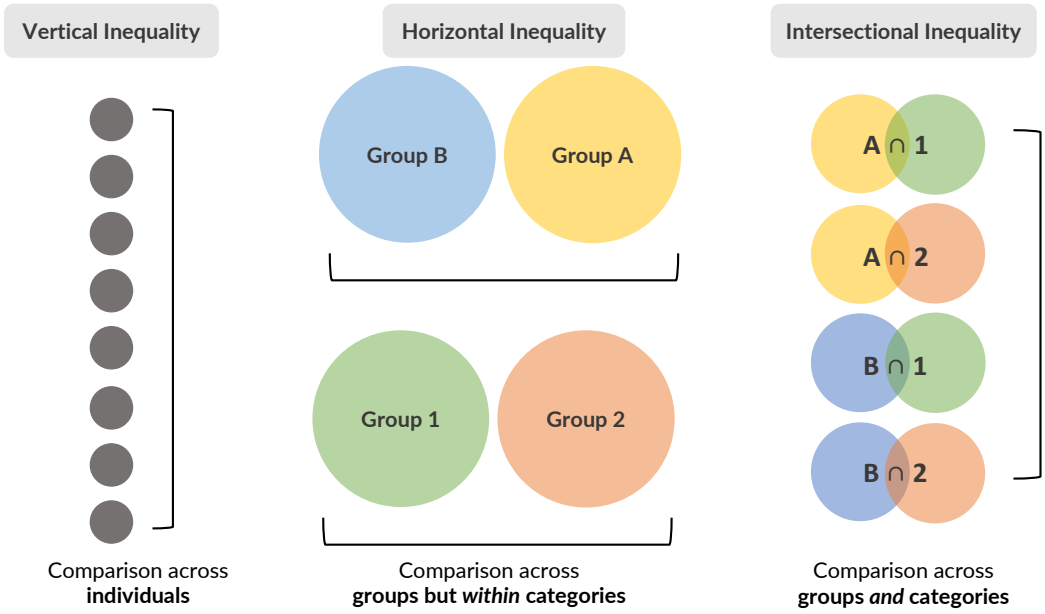

Figure 1: Concepts of inequality measurements

Note: Authors' own representation adopted from Lenhardt and Samman (2015)

In this article, we closely follow the concept of horizontal inequality, but we expand it by an additional dimension. As Figure 1 shows, instead of analyzing inequalities across gender and ethnicity separately, we use "intersecting" groups, i.e., we compare women and men that belong to different ethnic groups. This intersectional perspective allows us to uncover gender differences within and across ethnic groups. The term "intersectionality" originated in the Black feminist tradition of the 1960s and is used to describe the distinct experience of violence among women of color in the US (Crenshaw, 1989, 1991). Crenshaw initially focused on race and gender, emphasizing that the two social groupings cannot be understood as independent variables but that discrimination sometimes only occurs when race and gender intersect. Therefore, a black woman might face specific disadvantages that neither Black men nor white women experience.

Similarly, Kabeer (2016) uses the term "intersecting inequalities" to highlight the overlapping disadvantages individuals face, reinforcing their exclusion. The particular overlaps that characterize marginalization vary by context, but Kabeer (2016) points out that the most enduring forms of group-based disadvantages are strongly associated with identities

(arguably) ascribed at birth, such as race, caste, gender, and ethnicity. In principle, the concept of intersectional inequality is similar to multidimensional inequality (Alkire and Foster, 2011; Bourguignon and Chakravarty, 2019). But in contrast to the literature on multidimensional inequality, intersectionality occurs in the social groupings (e.g., gender and ethnicity) rather than the outcome variables of well-being (e.g., wealth, education, and health).

3 Measures

Inequality ratio. To measure horizontal and intersectional inequality between social groups, we mainly focus on the inequality ratio (IR). It is a simple (unweighted) ratio between the group with the highest average of an outcome variable – in our case, years of education – and the group with the lowest average. Formally, we can describe IR in the following way. Let s_j be the mean in years of education for group j as follows,

$$s_j = \frac{\sum^{i \in j} w_i educ_i}{\sum^{i \in j} w_i}, \tag{1}$$

where w represents the sampling weights. Then the inequality ratio IR for characteristic G is calculated as

$$IR(G) = \frac{min\{s_j, ..., s_J\}}{max\{s_j, ..., s_J\}}, \ where \ G \in \{gender, ethnicity, gender \times ethnicity\} \tag{2}$$

Because the numerator is weakly smaller than the denominator, the inequality ratio is bounded between 0 and 1. A value closer to 1 will imply complete equality, whereas a value closer to 0 implies more inequality between the groups. Compared to other inequality measures, such as the Gini or Theil index, the inequality ratio has the advantage that it is intuitively interpretable and mainly conveys information about the tails of the distribution (Conceicao and Ferreira, 2000; Cobham and Sumner, 2013). Its value tells what fraction of education the group with the lowest average has compared to the highest group. For example, assuming men have higher average education than women (as is the case in most countries of our sample), an inequality ratio of $IR(gender) = 0.75$ means that women have, on average, 75% of the years of education of men.

When there are only two groups – as is the case for gender – there are hardly any reasons to resort to a more complex measure of horizontal inequality such as the Gini index. When there are more than two groups, the inequality ratio has the property that it omits large parts of the information by only comparing the two most extreme groups. The drawback of this property is that a higher number of groups for a given sample size results in fewer observations per group. Few observations potentially lead to biased estimates of the inequality ratio. The most advantaged and most disadvantaged groups are likely to be small groups with imprecisely estimated group averages. Although the inequality ratio certainly has its limitations as a measure of inequality, considering the SDG mantra of "Leave No One Behind," one could argue that any observed differences between arbitrary social groups in education are undesirable by this standard.

Now, what sets the approach in this paper apart from the standard measurement of horizontal inequalities, is the intersectional perspective. In the measurement of standard horizontal inequalities, the grouping G is defined by one characteristic, meaning that group j always represents either one gender or ethnic group. Here, we use intersecting groups, in other words, every combination of gender and ethnicity. In this simple setup, the number of

groups is doubled compared to the original number of ethnic groups; for each ethnic group, there is now a separate group for women and men.

We deliberately do not weigh the group averages by the corresponding population size. The motivation for this approach is that we do not want to impose a relative importance to any groups outcome. In contrary, we are particularly interested in the outcomes of minority groups. Our measure does only consider the two extreme groups (most advantage/disadvantaged), which, in many cases represent minorities. Using population weights would lead to strong distortions if one of the extreme groups is particularly small while the other is large.

Mechanical and surplus intersectionality. This paper aims to estimate intersectional inequality in education across low- and middle-income countries and compare the results against common horizontal inequality measures. To this end, we first directly compare the estimates of intersectional inequality ($gender \times ethnicity$) to the horizontal inequality estimates based on single groupings ($gender\ or\ ethnicity$). However, the estimates based on single groupings only give us a limited benchmark to evaluate the relative importance of intersectional inequality. The issue with directly comparing the inequality ratio $IR(gender \times ethnicity)$ to $IR(gender)$ and $IR(ethnicity)$ is that part of the gap between the intersectional and the non-intersectional measure arises "mechanically." In other words, if there is at least some gender inequality within the most and least disadvantaged ethnic groups, one will always obtain a greater inequality ratio for the intersectional groupings relative to gender and ethnicity in isolation.

We could think about a hypothetical situation where the education gender gap was constant across ethnic groups to avoid this problem. In other words, one can calculate the "mechanical" component of the intersectional inequality ratio by applying the same difference between women and men for the lowest and the highest educated ethnic group, as is the case for a country's overall population. To avoid problems with negative years of education, we apply the *relative* gender gap (in percent) in education to the lowest and highest educated ethnic groups. As we advance, we refer to this measure as "mechanical intersectionality." We then calculate the difference between the mechanical intersectionality and the observed intersectional inequality. As a result, we obtain a measure of "surplus intersectionality." The greater the value of this measure, the more the intersectional inequality measure actually uncovers intersectionality that would not have been visible by analyzing gender and ethnicity in isolation.

Figure 2 illustrates the intuition behind mechanical intersectionality. It shows a scenario where u shows the overall gender gap in education, v the gap across two ethnic groups, and w the observed intersectional gap between the combinations of gender and ethnicity. The mechanical intersectionality would then be derived from the gap u', obtained by applying the overall gender gap to the two most extreme ethnic groups (in this case, there are only two groups). Surplus intersectionality would then be the difference between the inequality ratios $IR(w)$ and $IR(u')$.

In this example, it is unclear which inequality ratio would be greater, $IR(w)$ or $IR(u')$. On the one hand, women in Group B are disproportionately disadvantaged compared to women overall. On the other hand, men are relatively less advantaged in Group A. Thus, in this case, it would depend on the relative difference between the female gap in Group B and the male gap in Group A, whether surplus intersectionality turns out to be positive or negative.

Formally, we define mechanical intersectionality in the following way. Let

$$s_{min} = min\{s_j, ..., s_J\}, s_{max} = max\{s_j, ..., s_J\}, \tag{3}$$

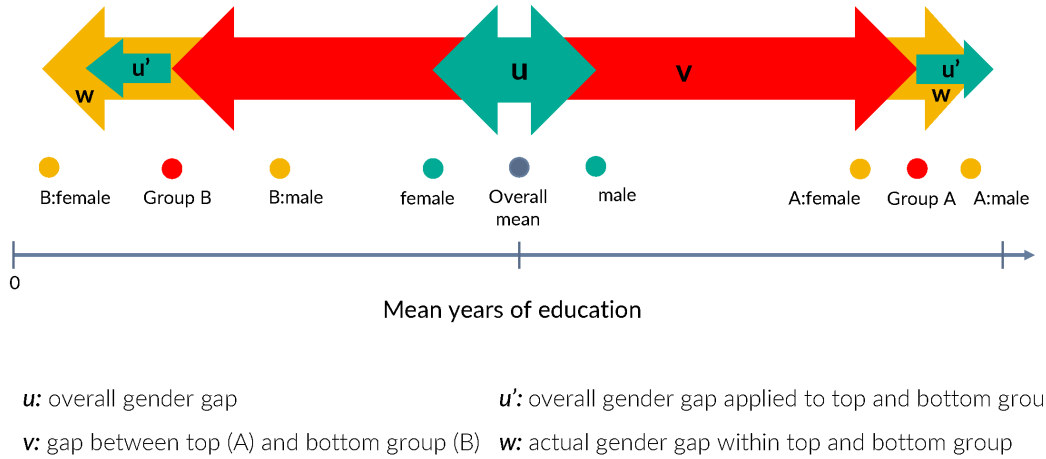

Figure 2: Schematic depiction of the observed and mechanical intersectional inequality

Note: Figure depicts a hypothetical scenario in which there are two categories with two groups each: female and male, group A and group B.

denote the respective group average of the ethnic group with the lowest and the highest education. Assuming women have, on average, lower education than men, then the mechanical gender differences within the two extreme ethnic groups can be written as

$$s_{min}^{mech} = s_{min}\left(1 - \frac{(s_{overall} - s_{female})}{s_{overall}}\right), s_{max}^{mech} = s_{max}\left(1 - \frac{(s_{overall} - s_{male})}{s_{overall}}\right), \quad (4)$$

where $s_{overall}$ denotes the total (gender-weighted) average in education. Then the inequality ratio of mechanical intersectionality is

$$IR_{mech}(gender \times ethnicity) = \frac{s_{min}^{mech}}{s_{max}^{mech}}. \quad (5)$$

Surplus intersectionality would be nothing more than the difference between the mechanical inequality ratio and the observed intersectional inequality ratio:

$$\Delta_{gender \times ethnicity} = IR_{mech}(gender \times ethnicity) - IR_{obs}(gender \times ethnicity) \quad (6)$$

Note that because a lower inequality ratio means higher inequality, we subtract mechanical from observed intersectionality. That way, if $\Delta > 0$, it means that we observe *higher* intersectional inequality in reality than we would expect if gender inequality was constant across ethnic groups.

4 Data

To construct the horizontal and intersectional inequality measures, we use data on individuals' education in years of schooling and measure inequality grouped by gender and ethnicity. We use data from all DHS rounds where both women and men were interviewed, and the respondent's gender, ethnicity, and years of education were recorded. The resulting sample of 39 low- and middle-income countries contains data from 1992 until 2019 (see 4 for a detailed

list of the countries and sample sizes per country). The sample consists predominantly of sub-Saharan African countries, but South Asian and Latin American countries are adequately represented. There is a lack of Middle Eastern and North African countries to make the countries globally representative of low- and middle-income countries. This lack does not arise because there is no DHS data for this region of the world but because, in many cases, ethnicity was not elicited, or no men's module was administered as part of the DHS survey.

Additionally to the DHS data, we include data from the Current Population Survey (CPS) 2019 for the United States (US) (Flood et al., 2021). We do not include the US because it is supposed to act as a benchmark of "where countries should aim," but because the literature on intersectionality originates in the US context. Thus it is relevant to see how global intersectional inequality in education based on ethnicity/race and gender compares to the US.

We split the data into three birth cohort brackets; up to 1969, between 1970-1979, and 1980 and after. We chose the cohort brackets to have a high overlap between the countries. To this end, we partitioned the pooled sample into three chunks, where the 33rd and 66th percentile indicate the cutoff. Splitting the data into cohort brackets allows us to control for time trends in education within countries. Overall, this approach results in 97 cohort-country combinations.

Education, the primary variable of interest, is measured by years of schooling. We prefer years of schooling over, for instance, the highest completed level of education because it is the most widely elicited statistic of education. Moreover, we set an upper bound of 17 years of education (12 years of primary and secondary education and five years of tertiary education).[4] Also, we limit the sample to respondents that are 25 years and older to mitigate the problem that many of the younger respondents might still be in school.

To calculate between-group inequality, we use gender and ethnicity as grouping variables. While it would be conceivable to group by other characteristics, such as religion, region, or urban vs. rural residence, we decided to focus on the two variables most unequivocally ascribed at birth. Yet, in contrast to gender, ethnicity poses two challenges when used as a grouping variable. Firstly, ethnic groups are not harmonized across DHS survey rounds. In other words, the definition of ethnic groups is not consistent across survey rounds within a given country. Secondly, many ethnic groups have a small sample size. Particularly for younger and older cohorts, the number of observations for a given cell (a cohort-ethnicity-gender combination) is too small for a meaningful statistical analysis. To counter these challenges, we harmonize ethnic groups across survey rounds to ensure a minimum of 40 observations per cell and consistent naming.

We apply a uniform process across all countries to ensure consistency. As a first step, we harmonize ethnic groups across survey rounds within countries. To this end, we identify the larger groups to which smaller sub-groups belong if they only appear in particular DHS rounds. To identify the connections, we rely mostly on the online database Ethnologue. In a second step, we count the observations for each combination of ethnic groups, gender, and cohort bracket. We then merge each ethnic group where one gender does not reach at least 40 observations for a cohort bracket. Consequently, due to gender imbalance in DHS data, ethnic groups with fewer than 40 male respondents in a cohort bracket are merged into larger groups if they constitute a sub-ethnicity of a larger ethnic group. When merging is impossible, smaller ethnic groups are lumped into a separate group called "other." [5]

[4] People that hold advanced tertiary degrees, such as a Ph.D. are therefore relegated to 17 years of education.

[5] See Table 6 in the Appendix for a detailed list of the surveys used and the ethnic groupings. The reader can find detailed R code documenting the harmonization of ethnicity names on this GitHub repository.

5 Results

Table 1 shows descriptive statistics for key variables of our analysis split by birth cohort brackets. It shows an increase in education of 1.4 years between the first (column 1) and the third (column 3) cohort bracket. The average inequality ratios reveal that gender inequality decreased by nine percentage points from the older to the younger birth cohorts and ethnic inequality decreased by seven percentage points. At the same time, intersectional inequality decreased by eleven percentage points. Further, the share of female respondents is eleven percentage points higher for younger birth cohorts. The average number of ethnic groups remains constant, which one should expect given that we harmonized ethnic groups across survey rounds. Regarding sample size and composition, Table 1 shows that the sample size is not equally distributed across cohorts. However, this comes from the fact that only countries with observations in all three cohort brackets were included in this table in order to ensure comparability over time. The share of the rural population decreased by four percentage points and one percentage point for the group with the lowest and the highest education, respectively.

Table 1: Descriptive statistics by birth cohort brackets

Characteristic	**-1969**, N = 30	**1970-1979**, N = 30	**1980-**, N = 30
Education (yrs)	5.0 (3.4)	5.6 (3.4)	6.4 (3.3)
IR(gender)	0.63 (0.21)	0.67 (0.21)	0.72 (0.20)
IR(ethnicity)	0.39 (0.25)	0.44 (0.25)	0.46 (0.25)
IR(gender*ethnicity)	0.26 (0.25)	0.32 (0.28)	0.35 (0.26)
Female (%)	0.62 (0.08)	0.72 (0.07)	0.73 (0.08)
No. of ethnic groups	8 (4)	8 (4)	8 (4)
Sample size	34,320 (133,352)	22,700 (67,330)	29,491 (104,609)
Rural pop. lowest %	0.70 (0.22)	0.69 (0.23)	0.66 (0.23)
Rural pop. highest%	0.48 (0.23)	0.49 (0.24)	0.47 (0.22)

[1] Mean (SD); Median (IQR) for no. of ethnic groups.

Notes: Aggregated by birth cohort brackets; n =2'689'279 individuals older than 25 years and younger than birth cohort of 1920. For comparability, only countries with observations in all three cohort brackets are included. Sources: DHS 1992-2019 and US CPS 2019.

5.1 Intersectional inequality

Figure 3 shows the estimates for inequality ratios by gender, ethnicity, and intersecting groups (*gender* × *ethnicity*). An inequality ratio of 1 implies perfect equality between the groups with the lowest and highest average education. In contrast, a ratio close to 0 indicates large disparities between the two most extreme groups.

The ratios are generally high (closer to 1) for gender, indicating relative equality in education across the sample of countries. Although some countries like Afghanistan, Nigeria, and Chad still display high education inequality between men and women. In the USA, the country with the lowest gender gap in education, men have on average 98% of women's of years of education. In Afghanistan, the country with the widest gender gap, women on average have 21% of men's education.

Compared to the results for gender, the inequality ratios for ethnicity are generally lower, indicating higher inequality between the most and least disadvantaged group. Only a few countries display lower inequality by ethnic groups than gender (Afghanistan, Guinea, Liberia,

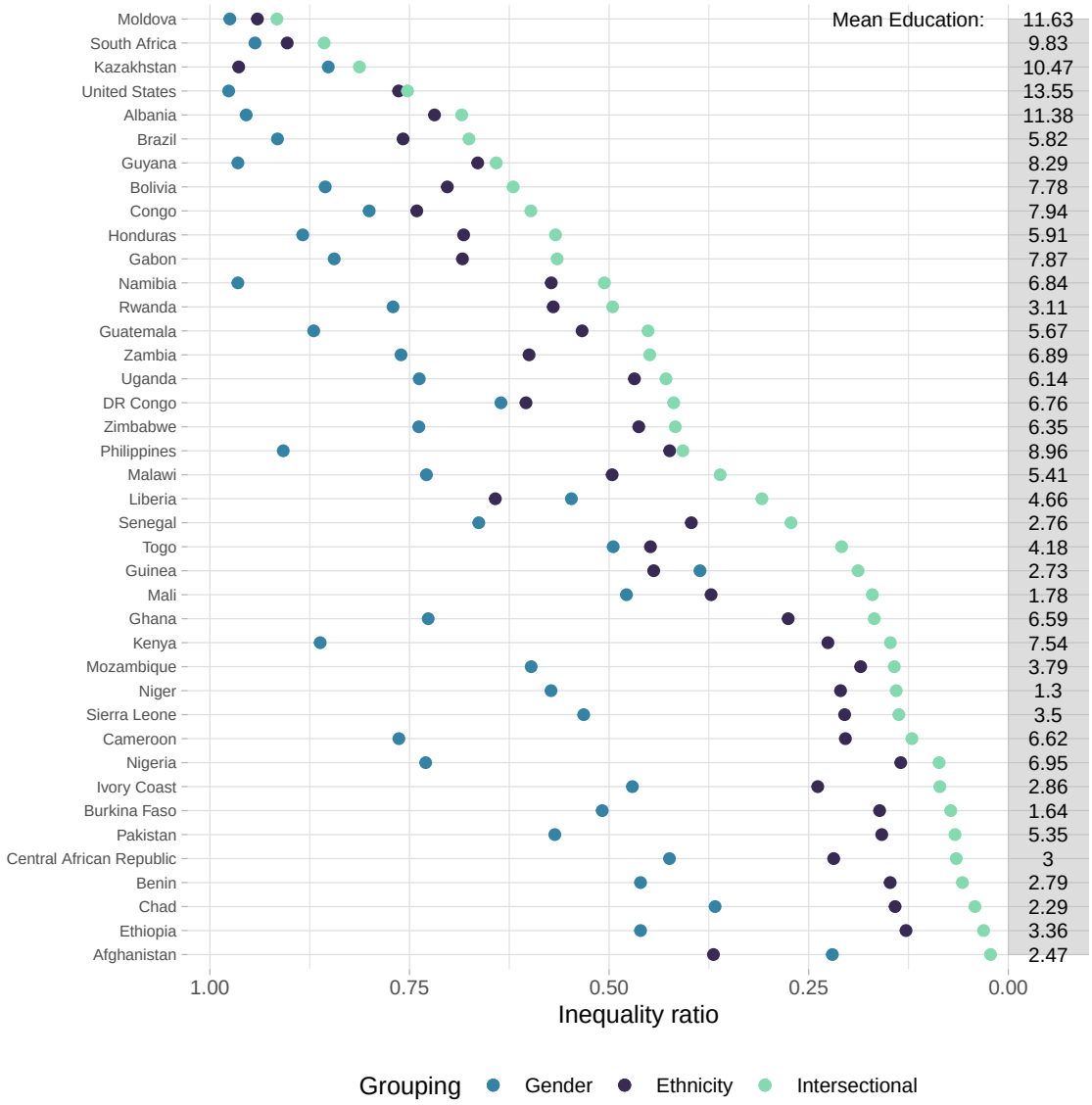

Figure 3: Inequality in education (years of schooling) by gender, ethnicity and intersecting groups

Notes: Pooled data from 40 countries; n =2'689'279 individuals older than 25 years and younger than the birth cohort of 1920. Estimates show inequality ratios between groups with the lowest and highest average years of education using DHS sample weights. A value of 1 implies parity and a value of zero total inequality between the two most extreme groups. Sources: DHS 1992-2019 and US CPS 2019.

Kazakhstan). Ethnic disparities are exceptionally high in sub-Saharan African countries with inequality ratios ranging from 96% in Kazakhstan to 13 % in Ethiopia.

The inequality ratios for intersecting groups (*gender* × *ethnicity*) are displayed in the lightest tone. Intersectional inequality is strictly higher than inequality based on gender and ethnic groups (manifested in low inequality ratios). Figure 3 clearly shows that in almost half of the countries of our sample, intersectional inequality ratios are below 25%. In other words, in almost half of the countries, the women of one ethnic group, on average, have less than a quarter of the years in education than men of another ethnicity. For example, in Afghanistan, Tajik men have on average 5.14 years of education, while Nuristani women have

on average 0.16 years, resulting in an inequality ratio of 0.02 (Table 6 in Appendix A shows the group means by gender, ethnic and intersecting groups).

The figure also shows that the measures of inequality seem to be highly correlated. The Spearman correlation is 0.95, 0.83, and 0.70 been the intersectionality ratios for intersecting and ethnic, intersecting and gender, and ethnic and gender groups. This implies that ranking of countries changes the least when comparing then inequality ratios between intersecting and ethnic groups. Therefore, intersecting inequality seems to be more driven more by ethnicity than gender.

In nine countries, gender order is reversed, meaning that either the group with the lowest education is male or the group with the highest education is female (see Table 5 in Appendix C). For all countries with data in at least two cohort brackets, the more disadvantaged gender is constant across cohorts. At the same time, the most advantaged and disadvantaged ethnic groups often change over time (in six countries for the most disadvantaged and in 16 for the least disadvantaged ethnicity). This indicates that disadvantages based on ethnicity are more persistent than advantages.

Further, there are cases where the most disadvantaged intersecting group has a different gender compared to the more disadvantaged gender overall. For instance in the Philippines, men have generally 89-93% of the average years of education compared to women. Yet, the most disadvantaged group are women of the (also most disadvantaged) ethnic group of *Maguindanaon*, who only have 37-45% of the average years in schooling that the least disadvantaged group has (*female Tagalog*, also the least disadvantage ethnic group). Similarly, in 14 instances, the ethnicity of the most disadvantaged intersecting group does not correspond to the overall most disadvantaged ethnic group. In these cases, the clearly learn more from taking an intersectional perspective.

5.2 Surplus intersectionality

As was pointed out in Section 3, the ratio for intersectional inequality will always be smaller (and therefore indicate more inequality) than the separate inequality ratios for gender or ethnicity. This property was evident in Figure 3: as long as there is some gender inequality in the most disadvantaged ethnic group, the most disadvantaged intersecting group will always have a smaller average than the ethnic group with the lowest education. This property is *mechanical*, meaning that it is not an artifact of intersectionality in it's narrow definition but that it arises *by design*. Thus, we calculate a measure for *mechanical intersectionality* that reflects the intersectional inequality that would arise if all ethnic groups had the same gender inequality as the whole population.

Figure 4 shows the difference between the *mechanical intersectionality* and the observed intersectional inequality, which we call *surplus intersectionality*. A value of zero indicates that observed and mechanical inequality are the same. A value above zero indicates that the observed inequality is higher (lower inequality ratio) than the mechanical inequality ratio. A value below zero indicates that observed inequality is lower (higher inequality ratio) than mechanical inequality.

Twenty-five out of 40 countries show positive surplus intersectionality In these countries, observed intersectional inequality is higher than mechanical intersectionality. In other words, the gender gap is either particularly wide for the most advantaged or the most disadvantaged ethnic group. In some sense, one could say that in these countries, measuring inequality in an intersectional manner highlights that women (sometimes men) of certain ethnic groups are particularly disadvantaged or men (sometimes women) of particular ethnic groups are particularly advantaged. For instance, in Afghanistan, the observed intersectional inequality is 0.022 (or 2%), and mechanical inequality is 0.081 (or 8.1%), resulting in surplus

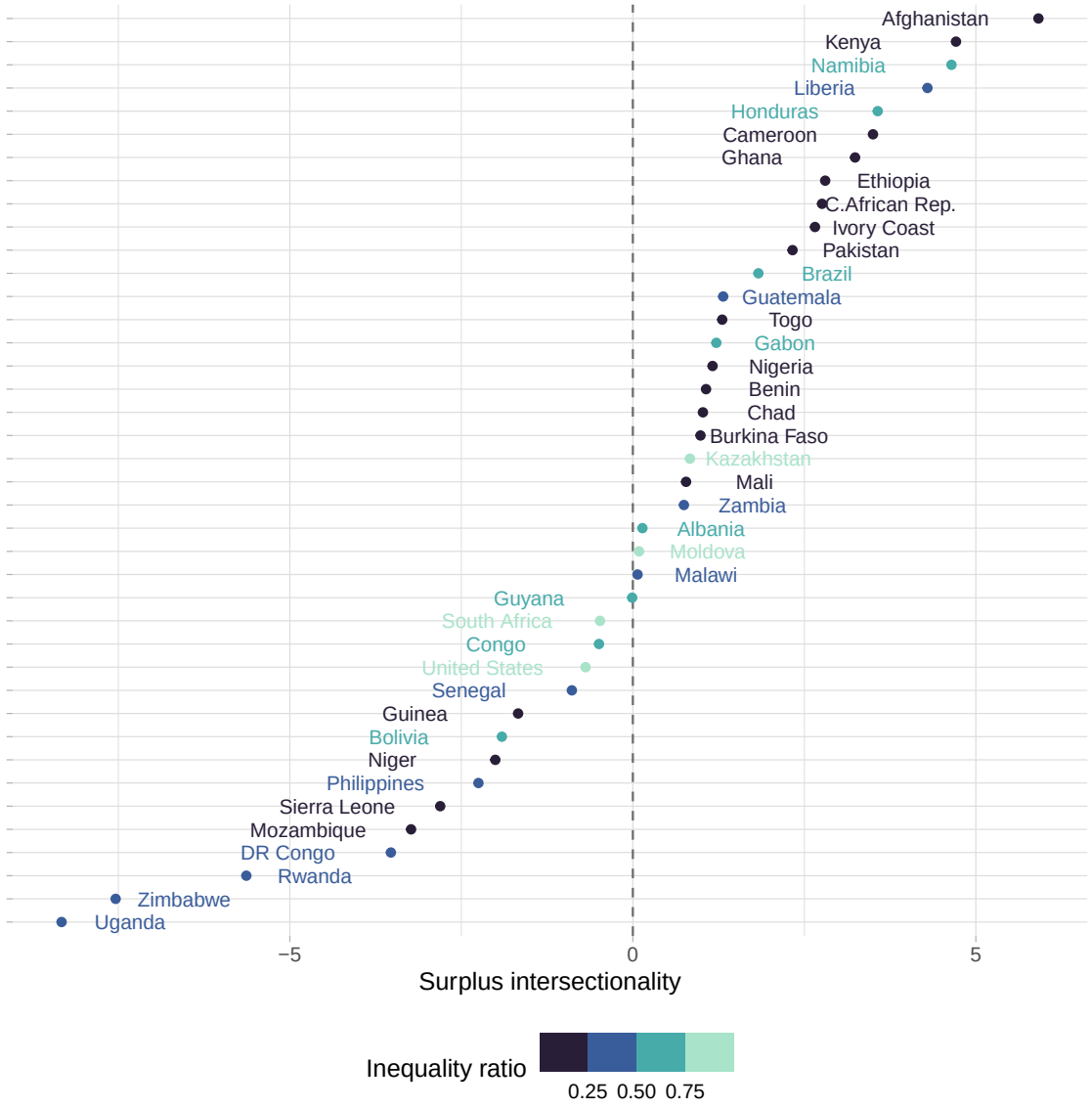

Figure 4: Surplus intersectionality (difference between mechanical and observed intersectional inequality

Note: Pooled data from 40 countries; n =2'689'279 individuals older than 25 years and younger than the birth cohort of 1920. Estimates show the relative difference (in percent) between mechanical and observed intersectional inequality ratios. Values above zero indicate higher observed intersectional inequality (lower IR) than would be the case with constant relative gender gaps across ethnic groups. Sources: DHS 1992-2019 and US CPS 2019.

intersectionality of 0.059 or (5.9%age points). This difference is substantial considering the already low values of the observed and mechanical intersectionality.

Meanwhile, 15 out of 40 countries exhibit values below zero. This result can only arise when observed gender inequality is smaller (higher ratio) in the extreme ethnic groups than across the whole distribution. Therefore, the gender gap is narrower for the most advantaged and the most disadvantaged ethnic group compared to the overall population of that country. A practical implication of these findings could be that countries with negative surplus intersectionality should focus on reducing general education inequality, while countries

with positive surplus intersectionality run the risk of further exacerbating disparities if their education policies are not tailored to reaching (girls of) the most disadvantaged groups.

5.3 Sensitivity analysis

As we have seen in Figure 3 there is a large variation in intersectional inequality across countries, which raises questions regarding the role of sample size as a driver of this variation. To test whether the sample size and the number of groups play a significant role in determining the inequality ratios, we conduct a sensitivity analysis varying those parameters.

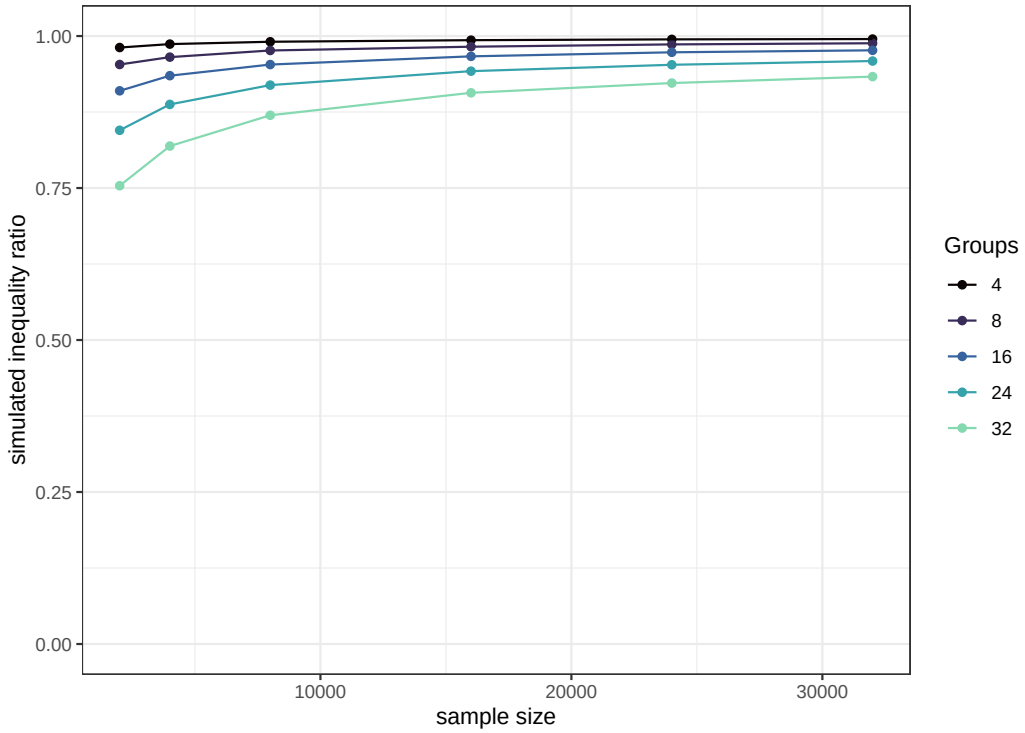

Figure 5: Simulation with varying group size and sample size

Notes: Based on averages across 1000 iterations. Education data is drawn randomly from a truncated normal distribution bounded between 0 and 17 years with $\mu = 5.5$ and $\sigma = 3$, corresponding to the average education and standard deviation across all countries.

We simulate samples by randomly drawing education and group membership from a given distribution. In principle, by the law of large numbers, neither the number of groups nor the relative group size should impact the inequality ratio if the sample size approaches infinity. In other words, if the sample is large enough, the inequality ratio between arbitrarily drawn partitions of the sample (groups) converges to one, i.e. perfect equality. However, in reality, the sample size is limited, and with an increasing number of groups, extreme values become more likely when the number of observations within a group is small. We manipulate these parameters in simulations to establish how much of the observed inequality could be caused by these sample characteristics.

In Figure 5, we first vary the number of groups and the sample size. We find that, given a low number of groups, the sample size has minimal impact on the inequality ratio. The inequality ratio is practically one with four groups (the minimum for the intersectional inequality ratio) and 2000 observations. However, a low sample size with many groups

becomes somewhat problematic. For example, with 32 groups and 2000 observations (62 observations per group), the simulated inequality ratio is close to 0.75. With increasing sample size, the ratio improves substantially to roughly 0.93 for a sample of 32'000 observations. Even though 32 groups might seem like an extreme case, it is still completely within the bounds of real-world data. For instance, in Ethiopia and Zambia, which have the highest number of ethnic groups in our sample, the number of intersecting groups is 36 (18 ethnic groups split by gender). The reason for this divergence is that the smaller the analytic groups become, the more likely it is that one group will have a particularly low or high average, leading to extreme inequality ratios.

This is why, in the next section, we take the sample size and number of ethnic groups into account for robustness checks when running regressions to identify correlates of the inequality ratio.

5.4 Correlates of intersectional inequality

In Table 2, we explore what might be possible determinants of horizontal and intersectional inequality. While the results do not identify the causal drivers of intersectional inequality, this correlational analysis is still useful as a first approximation of what may drive intersectional inequality. In particular, we examine the role of institutional and economic factors such as average education, GDP per capita, the size and number of ethnic groups, the share of female respondents in a country, the proportion of individuals with no formal education, and an index for the social and institutional framework regarding gender discrimination. We use the horizontal and intersecting inequality ratios as the dependent variables in OLS regressions with cohort fixed effects.

Table 2: Correlates of group inequality in education (OLS)

Inequality ratio:	Group inequality ratio									
	Gender		Ethnicity		Intersect.		Mechanical		Surplus	
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(Intercept)	0.466*	0.543*	0.547	1.006**	0.334	0.700***	0.271	0.655**	-6.266	-4.443
	(0.177)	(0.210)	(0.347)	(0.288)	(0.250)	(0.184)	(0.258)	(0.195)	(5.111)	(4.962)
Mean education (yrs)[a]	0.045***	0.044***	0.052***	0.049***	0.055***	0.052***	0.052***	0.049***	-0.222	-0.251
	(0.007)	(0.007)	(0.013)	(0.010)	(0.011)	(0.008)	(0.010)	(0.007)	(0.197)	(0.198)
Log(GDP p.c.)	0.014	0.021	-0.027	-0.037	-0.007	-0.015	0.003	-0.001	1.004	1.320*
	(0.023)	(0.021)	(0.041)	(0.030)	(0.029)	(0.019)	(0.030)	(0.020)	(0.597)	(0.560)
SIGI[b]	-0.004**	-0.005**	-0.005	-0.004+	-0.007**	-0.007***	-0.007**	-0.006***	0.025	0.017
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.047)	(0.047)
Cohort 1970-1979[c]	0.000	-0.001	0.009	0.017	0.012	0.018	0.007	0.013	-0.445	-0.518
	(0.015)	(0.016)	(0.016)	(0.015)	(0.014)	(0.014)	(0.012)	(0.013)	(0.690)	(0.666)
Cohort 1980-	0.010	0.012	-0.014	0.006	0.000	0.016	-0.002	0.014	-0.222	-0.181
	(0.022)	(0.022)	(0.026)	(0.023)	(0.023)	(0.021)	(0.021)	(0.020)	(0.711)	(0.671)
Sample size[d]		-0.017		-0.029		-0.024+		-0.029*		-0.568*
		(0.017)		(0.018)		(0.012)		(0.011)		(0.264)
No. of ethnic groups		0.003		-0.018+		-0.014+		-0.012+		0.149
		(0.004)		(0.009)		(0.007)		(0.006)		(0.140)
Num.Obs.	97	97	97	97	97	97	97	97	97	97
R2 Adj.	0.791	0.793	0.545	0.668	0.733	0.801	0.753	0.824	-0.002	0.016
DV	0.675	0.675	0.442	0.442	0.321	0.321	0.334	0.334	1.338	1.338

Note:

Aggregated country-cohort bracket level data from 40 countries;

n=2'689'279 individuals older than 25 years and younger than birth cohort of 1920.

Cluster-robust standard errors on the country-level in parentheses.

[a] Country-wise weighted mean years of education with DHS sampling weights.

[b] Social Institutions and Gender Index from 0-100 (less-more discriminatory) against women.

[c] Ref: Cohort -1969.

[d] Corresponds to country-cohort sample size.

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Considering Panels A-F, we find that the average level of education in a given country seems to be significantly associated with less horizontal inequality in education. An increase of one year in schooling is associated with an increase of 4.5 (gender), 5.2 (ethnicity), and 5.5 percentage points (intersecting) in the inequality ratio, indicating less inequality. Given the considerable variation in average education across countries, the magnitude of these coefficients is remarkable. Moreover, as panels A and E show, countries that score low on the social institutions and gender index (SIGI) tend to have higher gender inequality in education. The SIGI ranges from 0 (less gender discrimination), to 100 (more gender discrimination). For instance, iun Panel A, one additional point on the SIGI scale (ranging from 0 to 100) translates into a 0.4 percentage points decrease in the gender inequality ratio, indicating an increase in gender inequality. Similarly, one additional point on the SIGI scale is associated with a 0.7 percentage point decrease in the intersectional inequality ratio in Panel E. There is no significant relationship between a country's inequality ratio and its economic performance, measured by logarithmic GDP per capita.

As a robustness check, we add the cohort sample size and the number of ethnic groups as control variables in Panel B, D, and F. Adding the two variables only marginally changes the results obtained in Panels A, C and D.

Lastly, we report the results for regressions using mechanical intersectionality and surplus intersectionality in Panels G-J. We find that mechanical intersectionality is again strongly correlated with the average education. A one-year increase in average education is associated with a 5.2 percentage point increase in the mechanical inequality ratio. Thus, a higher overall education level reduces mechanical inequality. Simultaneously, a higher education level reduces surplus intersectionality by 0.22 percentage points per year of schooling, although this coefficient is not statistically different from zero.[6]

Moreover, throughout panel the R^2 is remarkably high for regressions A-H. A short regression model with mean education as the only independent variable reveals that this variable contributes the most to the high R^2 figure, with an R^2 statistic of 0.76. At the same time, the variables have practically no explanatory power in explaining variation in surplus intersectionality.

6 Conclusion

In this paper, we propose a new way to incorporate the intersectionality framework into the measurement of horizontal inequalities based on extensive household survey data from low-and middle-income countries. We show that explicitly framing horizontal inequality from an intersectional perspective reveals large disparities between women and men of different ethnic groups. We introduce a new measure of "surplus intersectionality" to assess the extent to which intersectionality reveals inequality not visible if gender and ethnicity are considered in isolation in a standard horizontal inequality framework. Moreover, by conducting a sensitivity analysis based on simulated data, we show that the results are somewhat sensitive to sample size, the number of groups, and group size, as well as the distribution of observations across groups. Yet, the analysis also reveals that these factors are not sufficient to be the main drivers of the estimated inequality ratios. Furthermore, we test the correlation of intersectional inequality with several economic, institutional, and sample characteristics. We find that the main correlate of intersectional inequality is the average level of education in a country. Lastly, this paper does not only make descriptive

[6]Note that surplus intersectionality is not an inequality ratio but the difference between two ratios multiplied by 100. Therefore, in contrast to Panels A to H, the reader should interpret a positive sign on the coefficients as the percentage point *increase* in surplus inequality.

and methodological contributions to the measurement of inequality but also contributes to bridging the gap between more qualitatively oriented social sciences and quantitative fields such as development economics.

Yet, our analysis also faces some limitations that should be taken into account when interpreting our findings. First, the definition of the social identity that we summarize under the umbrella term "ethnicity" actually differs substantially across countries. In large parts of Sub-Saharan Africa, ethnic groups run along the lines of languages, dialects, or tribal kinship. In other contexts, such as the US or Brazil, race is the more salient social identity and is defined by a mixture of skin color, national origin, and indigenous status. Thus, cross-country comparisons of ethnic group inequality ought to be done with caution. Nevertheless, it is worth reemphasizing that any large and unconditional disparities between arbitrarily generated groups should be an indicator of systematic disadvantages.

Second, in contrast to the Gini or Theil index, the inequality ratio does only take the two most extreme groups into account. Therefore, we cannot draw any conclusions about the middle of the distribution. In our view, against the backdrop of *leaving no one behind*, it is warranted to consider only the most advantaged and disadvantaged groups.

Third, another limitation is the fact that our inequality measure does not give us any information about the gender of the two most extreme intersecting groups. For instance, it could be that in some cases, the most advantaged and most disadvantaged intersecting groups are both of the same genders. For the sake of simplicity, we leave the resolution of this issue to future research.

Lastly, the newly developed measure of surplus inequality does not distinguish whether intersectionality occurs because one group is particularly advantaged or disadvantaged. Yet, for policy, the two cases do not have the same implications. While the former would imply that education policy should be spread as widely as possible, the latter calls for specifically targeted interventions, for example, for females of the lowest education ethnic group. To avoid this problem, one could, for instance, contrast the relative disadvantage of the women in the lowest educated ethnic group with the country average rather than comparing it against the most advantaged group. The drawback of this approach, however, is that it would not reflect elite capturing. Consequently, we leave this approach to future research.

Another open question for future research is the cause of intersectional inequality in different contexts. What is the social environment, and what are the policies and institutional factors that shape intersectional inequalities in education in specific contexts? In our analysis, we touched upon this question, but more rigorous research is needed to answer this question.

Given our results, we recommend policy makers to take these intersectionalities into account when designing and implementing programs to increase access to basic education. Particularly in countries with high surplus intersectionality, special attention should be put on the targeting of education policies. Our framework could be extended to include other factors, such as place of residence to pinpoint particularly disadvantaged groups. Providing access to basic education for *all* children should be imperative in order to actually fulfilling the promise of *leaving no one behind*.

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Appendix A Group means by country

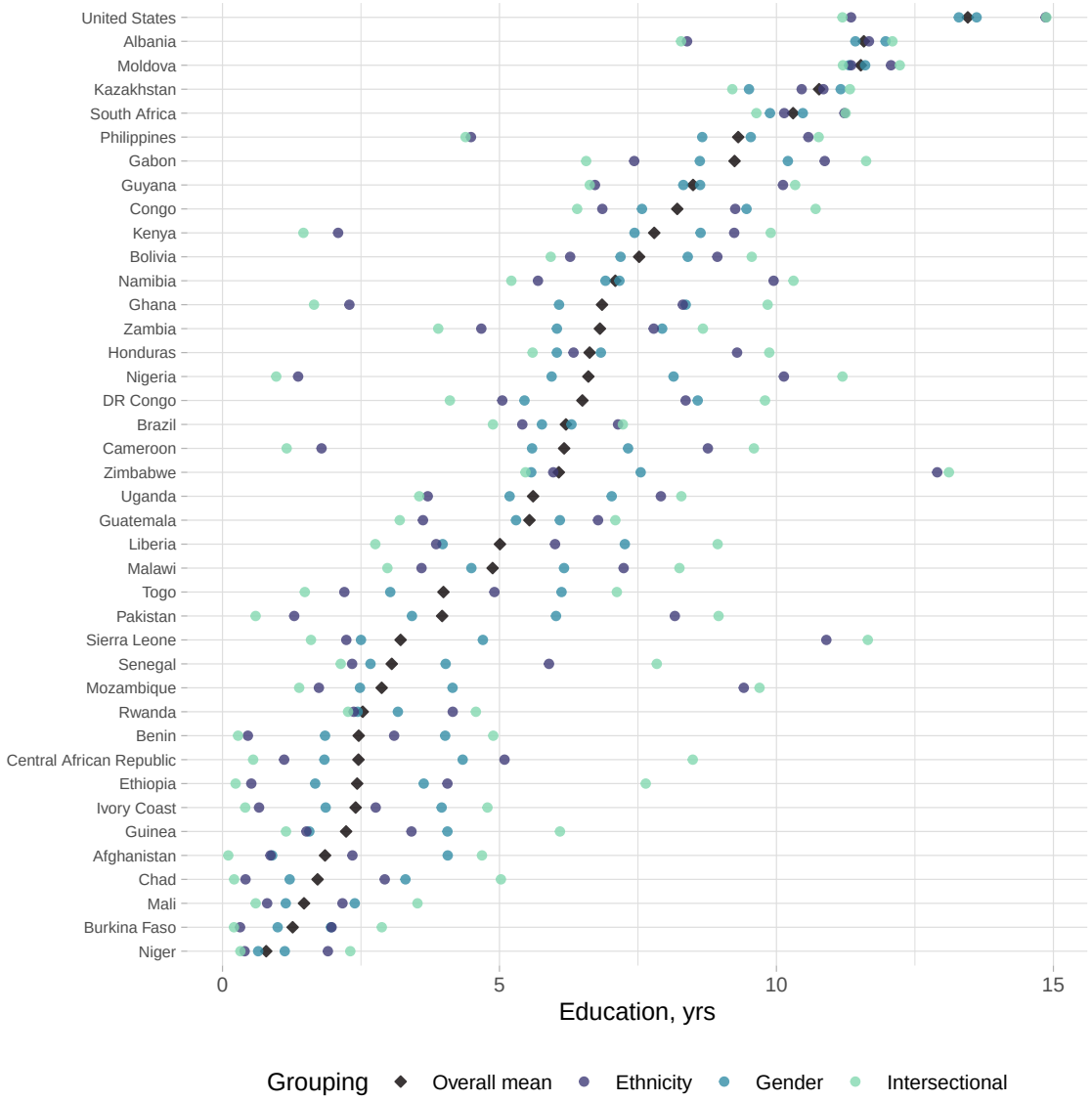

Figure 6: Average years in education by group

Notes: Pooled data from 40 countries; n =2'689'279 individuals older than 25 years and younger than the birth cohort of 1920. Estimates to the right of the overall mean represent the average education of the group with the highest education. Means are calculated using DHS sample weights. Sources: DHS 1992-2019 and US CPS 2019.

Appendix B Robustness checks with the Theil Index

Alternatively to the inequality ratio IR we can use a variant of the Theil Index, which is a special case of the General Entropy measures, as follows:

Table 3: OLS regression of between-group Theil indices of education inequality

Variable	Group Theil Index					
	Gender		Ethnicity		Intersect.	
	(A)	(B)	(C)	(D)	(E)	(F)
(Intercept)	0.904***	0.902***	0.885***	0.844***	0.895***	0.850***
	(0.058)	(0.069)	(0.103)	(0.101)	(0.090)	(0.099)
Mean education (yrs)[a]	-0.010***	-0.010***	-0.014**	-0.013**	-0.024***	-0.024***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)
Log(GDP p.c.)	0.004	0.001	0.014	0.015	0.022+	0.022+
	(0.007)	(0.006)	(0.011)	(0.011)	(0.012)	(0.011)
SIGI[b]	0.001+	0.001+	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Cohort 1970-1979[c]	0.004	0.005	-0.007	-0.007	-0.004	-0.005
	(0.007)	(0.008)	(0.005)	(0.005)	(0.008)	(0.009)
Cohort 1980-	0.000	0.001	-0.002	-0.004	-0.002	-0.004
	(0.008)	(0.008)	(0.007)	(0.008)	(0.011)	(0.011)
Log(Sample size)[d]		0.004		0.003		0.005
		(0.005)		(0.005)		(0.008)
No. of ethnic groups		-0.002		0.001		0.001
		(0.002)		(0.002)		(0.003)
Num.Obs.	97	97	97	97	97	97
R2 Adj.	0.493	0.503	0.338	0.336	0.565	0.562
DV	0.920	0.920	0.946	0.946	0.982	0.982

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Note:
Aggregated country-cohort bracket level data from 40 countries;; n=2'689'279 individuals older than 25 years and younger than birth cohort of 1920. Cluster-robust standard errors on the country-level in parentheses.

[a] Country-wise weighted mean years of education with DHS sampling weights.
[b] Social Institutions and Gender Index from 0-100 (less-more discriminatory) against women.
[c] Ref: Cohort -1969.
[d] Corresponds to country-cohort sample size.

$$T(G) = \frac{1}{J}\sum_{j=1}^{J}\frac{s_j}{\mu_s} arsinh(\frac{s_j}{\mu_s}),$$

where s_j denotes the group averages, as previously defined for IR, J denotes the numbers of groups and μ the unweighted mean of all s_j. Instead of the natural logarithm, as is normally used for the Theil Index, we use a inverse hyperbolic sine transformation ($arsinh$). It has the advantage of being defined for zero values as well, a problem that we would inevitably run into with education data from low- and middle income countries.

Repeating the regressions shown in Table 2 but with inequality measured by the Theil Index instead of the inequality ratio leads to the results reported in Table 3. The results remain fairly comparable.

Appendix C Aggregated Data

Table 4: Education inequality ratios by birth cohort and country for gender and ethnicity

Cohort	Education	IR(gender)	IR(ethnicity)	IR(gen:eth)	obs.
Afghanistan					
1970-1979	1.6 (3.62)	0.19	0.37	0.01	10207
1980-	2 (3.94)	0.23	0.34	0.03	17528
Albania					
-1969	11.37 (4.04)	0.94	0.79	0.73	10061
1970-1979	11.35 (4)	0.99	0.75	0.70	7103
1980-	12.14 (4.64)	0.94	0.62	0.56	6443
Benin					
-1969	2.33 (4.06)	0.46	0.07	0.03	17112
1970-1979	2.19 (3.7)	0.44	0.15	0.06	19084
1980-	2.86 (4.51)	0.45	0.18	0.06	17737
Bolivia					
-1969	6.78 (5.1)	0.83	0.67	0.57	8613
1970-1979	8.57 (4.92)	0.83	0.76	0.65	6097
Brazil					
-1969	6.13 (4.23)	0.92	0.75	0.68	9031
1970-1979	6.94 (3.88)	0.89	0.64	0.53	894
Burkina Faso					
-1969	0.92 (2.8)	0.50	0.16	0.05	18787
1970-1979	1.54 (3.52)	0.44	0.14	0.05	11479
1980-	1.96 (3.78)	0.53	0.10	0.02	4883
Cameroon					
-1969	5.24 (4.54)	0.69	0.11	0.05	13493
1970-1979	6.27 (4.58)	0.75	0.21	0.09	13365
1980-	7 (4.99)	0.78	0.24	0.17	12775
Central African Republic					
-1969	2.45 (3.64)	0.42	0.22	0.07	4616
Chad					
-1969	1.19 (2.84)	0.28	0.13	0.02	9039
1970-1979	1.61 (3.3)	0.30	0.17	0.04	7536
1980-	2.44 (3.97)	0.39	0.13	0.05	7733
Congo					
-1969	8.13 (4.38)	0.72	0.66	0.48	5256
1970-1979	8.2 (3.75)	0.81	0.81	0.62	7173
1980-	8.32 (3.85)	0.89	0.60	0.41	3930
DR Congo					
-1969	6.28 (4.59)	0.54	0.57	0.30	6636
1970-1979	6.55 (4.45)	0.65	0.61	0.44	9335
1980-	6.59 (4.58)	0.66	0.62	0.43	9355
Ethiopia					
-1969	1.48 (3.35)	0.32	0.10	0.00	17072
1970-1979	2.34 (3.92)	0.51	0.12	0.01	20654
1980-	3.42 (4.69)	0.49	0.18	0.03	18944
Gabon					
-1969	8.6 (3.8)	0.76	0.68	0.42	2079
1970-1979	9.03 (3.87)	0.80	0.58	0.48	2680
1980-	9.81 (3.82)	0.89	0.78	0.65	2506
Ghana					

Table 4: Education inequality ratios by birth cohort and country for gender and ethnicity *(continued)*

Cohort	Education	IR(gender)	IR(ethnicity)	IR(gen:eth)	obs.
-1969	6.14 (5.18)	0.66	0.16	0.11	11024
1970-1979	6.88 (5.03)	0.72	0.32	0.15	6505
1980-	8.27 (5.17)	0.82	0.36	0.26	5177
Guatemala					
-1969	4.26 (4.7)	0.76	0.42	0.27	3783
1970-1979	4.92 (4.74)	0.80	0.49	0.37	7471
1980-	6.38 (4.9)	0.85	0.58	0.50	10798
Guinea					
-1969	1.77 (4.24)	0.38	0.38	0.16	4734
1970-1979	1.64 (3.95)	0.28	0.42	0.12	4253
1980-	3.03 (5.29)	0.40	0.41	0.18	5811
Guyana					
-1969	7.92 (3.39)	0.97	0.66	0.61	2065
1970-1979	8.64 (3.28)	0.95	0.65	0.62	2327
1980-	9.26 (3.09)	1.00	0.68	0.61	1118
Honduras					
-1969	5.66 (4.57)	0.89	0.61	0.46	4657
1970-1979	6.44 (4.3)	0.94	0.68	0.62	7036
1980-	7.51 (4.34)	0.91	0.71	0.63	6768
Ivory Coast					
-1969	2.4 (3.91)	0.47	0.24	0.09	6088
Kazakhstan					
-1969	10.77 (2.51)	0.85	0.96	0.80	3533
1970-1979	10.77 (2.24)	0.84	0.97	0.81	875
Kenya					
-1969	6.55 (4.3)	0.75	0.16	0.07	19245
1970-1979	8.16 (3.94)	0.87	0.20	0.12	18720
1980-	8.84 (3.99)	0.91	0.25	0.16	15797
Liberia					
-1969	4.39 (5.16)	0.35	0.55	0.18	1402
1970-1979	4.55 (5.01)	0.51	0.57	0.29	3187
1980-	5.59 (5.12)	0.64	0.69	0.37	3776
Malawi					
-1969	3.63 (3.65)	0.60	0.34	0.16	15246
1970-1979	4.56 (3.96)	0.66	0.44	0.28	21043
1980-	6.32 (3.89)	0.83	0.65	0.53	17567
Mali					
-1969	1.29 (3.11)	0.47	0.34	0.12	21039
1970-1979	1.3 (3.2)	0.46	0.38	0.16	15553
1980-	2.01 (3.99)	0.46	0.33	0.15	12203
Moldova					
-1969	11.5 (2.33)	0.97	0.93	0.90	4121
1970-1979	11.54 (2.52)	0.99	0.97	0.96	2320
1980-	11.78 (2.74)	0.98	0.91	0.89	258
Mozambique					
-1969	2.21 (2.94)	0.47	0.17	0.11	8073
1970-1979	3.09 (3.49)	0.62	0.18	0.13	5241
1980-	3.96 (3.93)	0.65	0.20	0.15	3993

Table 4: Education inequality ratios by birth cohort and country for gender and ethnicity *(continued)*

Cohort	Education	IR(gender)	IR(ethnicity)	IR(gen:eth)	obs.
Namibia					
-1969	6.57 (4.24)	0.98	0.54	0.47	3882
1970-1979	8.11 (3.76)	0.94	0.62	0.56	1868
Niger					
-1969	0.61 (2.15)	0.60	0.18	0.12	13895
1970-1979	1.18 (2.83)	0.46	0.27	0.15	4970
1980-	1.17 (2.91)	0.38	0.29	0.10	1142
Nigeria					
-1969	5.51 (5.68)	0.63	0.10	0.05	18869
1970-1979	6.44 (5.69)	0.70	0.11	0.06	35890
1980-	7.16 (5.86)	0.74	0.16	0.11	47233
Pakistan					
-1969	3.09 (4.61)	0.44	0.13	0.01	2838
1970-1979	3.88 (4.95)	0.49	0.20	0.06	5525
1980-	4.49 (4.96)	0.69	0.13	0.09	5456
Philippines					
-1969	8.92 (4.21)	0.93	0.39	0.37	7089
1970-1979	9.9 (4)	0.89	0.47	0.45	4765
Rwanda					
-1969	2.53 (3.28)	0.77	0.57	0.50	4364
Senegal					
-1969	2.39 (4.23)	0.59	0.44	0.23	23810
1970-1979	2.92 (4.35)	0.60	0.40	0.25	25146
1980-	3.59 (4.86)	0.66	0.36	0.26	35847
Sierra Leone					
-1969	2.87 (4.88)	0.47	0.18	0.07	6013
1970-1979	2.44 (4.37)	0.49	0.14	0.09	12515
1980-	3.87 (5.1)	0.50	0.25	0.18	17503
South Africa					
-1969	8.78 (4.31)	0.92	0.74	0.67	1154
1970-1979	10.02 (3.58)	0.99	0.90	0.89	2537
1980-	10.85 (2.69)	0.97	0.92	0.89	4221
Togo					
-1969	3.34 (4.1)	0.42	0.37	0.13	7482
1970-1979	3.8 (4.11)	0.46	0.37	0.15	4954
1980-	5.38 (4.7)	0.57	0.62	0.32	4077
Uganda					
-1969	4.17 (3.92)	0.58	0.37	0.23	7065
1970-1979	5.11 (4.29)	0.69	0.47	0.35	7187
1980-	6.91 (4.5)	0.80	0.52	0.49	10809
United States					
-1969	13.23 (2.87)	0.99	0.72	0.72	739514
1970-1979	13.5 (2.91)	0.97	0.74	0.72	376732
1980-	13.65 (2.64)	0.97	0.78	0.76	580778
Zambia					
-1969	6.44 (4.05)	0.70	0.53	0.36	14043
1970-1979	6.77 (3.87)	0.78	0.62	0.52	13487
1980-	7.4 (4.01)	0.82	0.67	0.50	10080

Table 4: Education inequality ratios by birth cohort and country for gender and ethnicity *(continued)*

Cohort	Education	IR(gender)	IR(ethnicity)	IR(gen:eth)	obs.
Zimbabwe					
-1969	6.07 (4.02)	0.74	0.46	0.42	4506

Note:
Education reports mean (sd); IR(G) reports inequality ratios between the group with the highest and lowest average education.

Table 5: Names of groups with the lowest and highest education by birth cohort

Country	Cohort	Gender low	Gender high	Ethnicity low	Ethnicity high	Intersect. low	Intersect. high
Afghanistan							
Afghanistan	1970-1979	F	M	nuristani	tajik	F:nuristani	M:tajik
Afghanistan	1980-	F	M	nuristani	uzbek	F:nuristani	M:uzbek
Albania							
Albania	-1969	F	M	other	albanian	F:other	M:albanian
Albania	1970-1979	F	M	other	albanian	M:other	M:albanian
Albania	1980-	F	M	other	albanian	M:other	M:albanian
Benin							
Benin	-1969	F	M	Peulh	Yoruba	F:Peulh	M:Yoruba
Benin	1970-1979	F	M	Peulh	Other	F:Peulh	M:Fon
Benin	1980-	F	M	Peulh	Fon	F:Peulh	M:Adja
Bolivia							
Bolivia	-1969	F	M	quechua	none	F:quechua	M:none
Bolivia	1970-1979	F	M	quechua	none	F:quechua	M:aymara
Brazil							
Brazil	-1969	M	F	mixed	white	M:mixed	F:white
Brazil	1970-1979	M	F	black/other	white	M:black/other	M:white
Burkina Faso							
Burkina Faso	-1969	F	M	Touareg	Gurunsi	F:Touareg	M:Bobo
Burkina Faso	1970-1979	F	M	Touareg	Dioula	F:Touareg	M:Dioula
Burkina Faso	1980-	F	M	Touareg	Other	M:Touareg	M:Lobi
Cameroon							
Cameroon	-1969	F	M	Arab-choa/Peu...	Côtier/Ngoe/O...	F:Biu-Mandara	M:Côtier/Ngoe...
Cameroon	1970-1979	F	M	Arab-choa/Peu...	Beti/Bassa/Mbam	F:Biu-Mandara	M:Beti/Bassa/...
Cameroon	1980-	F	M	Arab-choa/Peu...	Côtier/Ngoe/O...	F:Arab-choa/P...	M:Beti/Bassa/...
Central African Republic							
Central Afric...	-1969	F	M	haoussa	yakoma-sango	F:haoussa	M:yakoma-sango
Chad							
Chad	-1969	F	M	gorane	sara (ngambay...	F:gorane	M:sara (ngamb...
Chad	1970-1979	F	M	kanembou / bo...	sara (ngambay...	F:kanembou / ...	M:sara (ngamb...
Chad	1980-	F	M	kanembou / bo...	sara (ngambay...	F:kanembou / ...	M:sara (ngamb...
Congo							
Congo	-1969	F	M	Other non-Con...	Mbohhi	F:Other non-C...	M:Mbohhi
Congo	1970-1979	F	M	Other Congolese	Mbohhi	F:Other non-C...	M:Mbeti
Congo	1980-	F	M	Babémbe	Mbohhi	F:Babémbe	M:Mbeti
DR Congo							
DR Congo	-1969	F	M	uele lac albert	bakongo	F:ubangi and ...	M:bakongo

Table 5: Names of groups with the lowest and highest education by birth cohort *(continued)*

Country	Cohort	Gender low	Gender high	Ethnicity low	Ethnicity high	Intersect. low	Intersect. high
DR Congo	1970-1979	F	M	uele lac albert	bakongo	F:uele lac al...	M:bas-kasai a...
DR Congo	1980-	F	M	uele lac albert	bakongo	F:ubangi and ...	M:cuvette cen...
Ethiopia							
Ethiopia	-1969	F	M	Affar	Welaita	F:Gumuz	M:Welaita
Ethiopia	1970-1979	F	M	Affar	Guragie	F:Berta	M:Nuer
Ethiopia	1980-	F	M	Affar	Nuer	F:Affar	M:Nuer
Gabon							
Gabon	-1969	F	M	other	myene	F:kota-kele	M:fang
Gabon	1970-1979	F	M	kota-kele	myene	F:kota-kele	M:myene
Gabon	1980-	F	M	kota-kele	myene	F:kota-kele	M:myene
Ghana							
Ghana	-1969	F	M	gruma	ga/dangme	F:gruma	M:ga/dangme
Ghana	1970-1979	F	M	gruma	akan	F:gruma	M:akan
Ghana	1980-	F	M	gruma	akan	F:gruma	M:akan
Guatemala							
Guatemala	-1969	F	M	maya/other	ladina/mestiza	F:maya/other	M:ladina/mestiza
Guatemala	1970-1979	F	M	maya/other	ladina/mestiza	F:maya/other	M:ladina/mestiza
Guatemala	1980-	F	M	maya/other	ladina/mestiza	F:maya/other	M:ladina/mestiza
Guinea							
Guinea	-1969	F	M	peulh	soussou	F:peulh	M:other
Guinea	1970-1979	F	M	peulh	soussou	F:guerzé	M:soussou
Guinea	1980-	F	M	peulh	other	F:peulh	M:other
Guyana							
Guyana	-1969	M	F	amerindian	african	F:amerindian	F:african
Guyana	1970-1979	M	F	amerindian	african	F:amerindian	F:african
Guyana	1980-	M	F	amerindian	african	M:amerindian	F:african
Honduras							
Honduras	-1969	M	F	None	Other	M:None	F:Other
Honduras	1970-1979	M	F	None	Other	M:None	F:Other
Honduras	1980-	M	F	None	Other	M:None	F:Other
Ivory Coast							
Ivory Coast	-1969	F	M	Burkina-Faso	Ivorian	F:Burkina-Faso	M:Ivorian
Kazakhstan							
Kazakhstan	-1969	M	F	Other	Russian	M:Other	F:Russian
Kazakhstan	1970-1979	M	F	Other	Russian	M:Russian	F:Russian
Kenya							
Kenya	-1969	F	M	turkana	kikuyu	F:turkana	M:kikuyu

Table 5: Names of groups with the lowest and highest education by birth cohort *(continued)*

Country	Cohort	Gender low	Gender high	Ethnicity low	Ethnicity high	Intersect. low	Intersect. high
Kenya	1970-1979	F	M	somali	kikuyu	F:somali	M:kisii
Kenya	1980-	F	M	somali	kisii	F:somali	M:kisii
Liberia							
Liberia	-1969	F	M	Kpelle	Grebo	F:Kpelle	M:Other Kru
Liberia	1970-1979	F	M	Kpelle	Other Kru	F:Kpelle	M:Other Kru
Liberia	1980-	F	M	Kpelle	Other	F:Kpelle	M:Grebo
Malawi							
Malawi	-1969	F	M	sena	tumbuka	F:sena	M:tumbuka
Malawi	1970-1979	F	M	sena	tumbuka	F:sena	M:tumbuka
Malawi	1980-	F	M	sena	tumbuka	F:sena	M:nkondhe
Mali							
Mali	-1969	F	M	dogon	malinke	F:dogon	M:malinke
Mali	1970-1979	F	M	tamacheck	malinke	F:dogon	M:malinke
Mali	1980-	F	M	tamacheck	bobo	F:tamacheck	M:bobo
Moldova							
Moldova	-1969	M	F	moldovan	other	M:moldovan	F:other
Moldova	1970-1979	M	F	moldovan	other	M:other	F:other
Moldova	1980-	M	F	moldovan	other	F:moldovan	F:other
Mozambique							
Mozambique	-1969	F	M	Chewa	Portuguese	F:Sena	F:Portuguese
Mozambique	1970-1979	F	M	Chewa	Portuguese	F:Chewa	M:Portuguese
Mozambique	1980-	F	M	Chewa	Portuguese	F:Chewa	M:Portuguese
Namibia							
Namibia	-1969	M	F	kavango langu...	afrikaans	F:kavango lan...	M:afrikaans
Namibia	1970-1979	M	F	kavango langu...	afrikaans	F:kavango lan...	M:afrikaans
Niger							
Niger	-1969	F	M	Touareg/Touar...	Other	F:Touareg/Tou...	M:Other
Niger	1970-1979	F	M	Touareg/Touar...	Other	F:Touareg/Tou...	M:Djerma
Niger	1980-	F	M	Touareg/Touar...	Djerma	F:Kanouri	M:Djerma
Nigeria							
Nigeria	-1969	F	M	Fulani	Yoruba	F:Fulani	M:Ijaw/Izon
Nigeria	1970-1979	F	M	Fulani	Yoruba	F:Fulani	M:Ijaw/Izon
Nigeria	1980-	F	M	Fulani	Igbo	F:Fulani	M:Yoruba
Pakistan							
Pakistan	-1969	F	M	Barauhi	Urdu	F:Balochi	M:Urdu
Pakistan	1970-1979	F	M	Barauhi	Urdu	F:Barauhi	M:Urdu
Pakistan	1980-	F	M	Barauhi	Urdu	F:Barauhi	M:Urdu

Table 5: Names of groups with the lowest and highest education by birth cohort *(continued)*

Country	Cohort	Gender low	Gender high	Ethnicity low	Ethnicity high	Intersect. low	Intersect. high
Philippines							
Philippines	-1969	M	F	maguindanaon	tagalog	F:maguindanaon	F:tagalog
Philippines	1970-1979	M	F	maguindanaon	tagalog	F:maguindanaon	F:tagalog
Rwanda							
Rwanda	-1969	F	M	hutu	tutsi/other	F:hutu	M:tutsi/other
Senegal							
Senegal	-1969	F	M	Poular	Other	F:Poular	M:Diola
Senegal	1970-1979	F	M	Poular	Diola	F:Poular	M:Diola
Senegal	1980-	F	M	Poular	Diola	F:Poular	M:Diola
Sierra Leone							
Sierra Leone	-1969	F	M	Fullah	Creole	F:Kono	M:Creole
Sierra Leone	1970-1979	F	M	Other	Creole	F:Other	M:Creole
Sierra Leone	1980-	F	M	Other	Creole	F:Other	M:Creole
South Africa							
South Africa	-1969	M	F	black/african	white/coloure...	M:black/african	M:white/colou...
South Africa	1970-1979	M	F	black/african	white/coloure...	M:black/african	M:white/colou...
South Africa	1980-	M	F	black/african	white/coloure...	M:black/african	F:white/colou...
Togo							
Togo	-1969	F	M	para-gourma/akan	akposso/akebou	F:para-gourma...	M:adja-ewe/mina
Togo	1970-1979	F	M	para-gourma/akan	akposso/akebou	F:para-gourma...	M:akposso/akebou
Togo	1980-	F	M	para-gourma/akan	kabye/tem	F:para-gourma...	M:ana-ife
Uganda							
Uganda	-1969	F	M	Ruanda-Rundi	baganda	F:moru-madi	M:baganda
Uganda	1970-1979	F	M	moru-madi	baganda	F:moru-madi	M:langi
Uganda	1980-	F	M	Ruanda-Rundi	baganda	F:alur-acholi	M:alur-acholi
United States							
United States	-1969	M	F	Other race	Japanese	M:Other race	F:Japanese
United States	1970-1979	M	F	Other race	Japanese	M:Other race	M:Japanese
United States	1980-	M	F	Other race	Chinese	M:Other race	F:Chinese
Zambia							
Zambia	-1969	F	M	mbunda	lozi	F:mbunda	M:namwanga
Zambia	1970-1979	F	M	mbunda	namwanga	F:mbunda	M:namwanga
Zambia	1980-	F	M	mbunda	lozi	F:mbunda	M:other
Zimbabwe							
Zimbabwe	-1969	F	M	black	white	F:black	F:white

Note:
Table reports the names of the groups with the lowest and the highest average education that were used to calculate inequality ratios.

Table 6: Survey years and ethnic groups

Country	Survey years	Ethnic groups	N groups
Afghanistan	2015	tajik, other, pashtun, hazara, uzbek, turkmen, nuristani	7
Albania	2009, 2018, 2017	albanian, other	2
Benin	1996, 2001, 2006, 2012, 2011, 2018, 2017	Other, Yoa/Lokpa, Bariba, Fon, Yoruba, Peulh, Betamaribe, Dendi, Adja	9
Bolivia	2004, 2003	quechua, none, aymara, other	4
Brazil	1996	mixed, white, black/other	3
Burkina Faso	1992, 1999, 2003, 2010	Mossi, Bobo, Gurunsi, Fulfuldé/Peul, Lobi, Dioula, Other, Gurma, Touareg, Senufo, Bissa, Dagara	12
Cameroon	1998, 2004, 2011, 2018, 2019	Arab-choa/Peulh/Haoussa/Kanuri, Biu-Mandara, Other, Bantoïde South-West, Bamilike/Bamoun, Adamaoua-Oubangui, Grassfields, Côtier/Ngoe/Oroko, Beti/Bassa/Mbam, Kako/Meka/Pygmé	10
Central African Republic	1994	banda, mandjia, ngbaka-bantou, other, yakoma-sango, gbaya, mboum, haoussa, sara	9
Chad	1996, 2004, 2014, 2015	arabic, sara (ngambaye/sara madjin-gaye/mbaye), other, ouadaï / maba / massalit / mimi, hadjarai, gorane, kanembou / bornou / boudouma	7
Congo	2005, 2011, 2012	Kongo, Other Kongo, Other Congolese, Balari, Babémbe, Teke, Mbohhi, Mbeti, Other non-Congolese, Ubangi, Sangha	11
DR Congo	2007, 2014, 2013	cuvette central, bas-kasai and kwilu-kwngo, ubangi and itimbiri, kasai, katanga, tanganika, bakongo, basele-komo, maniema, kivu, uele lac albert, other	8
Ethiopia	2000, 2005, 2011, 2016	Tigray, Amhara, Affar, Oromo, Guragie, Welaita, Somali, Sidama, Berta, Kefficho, Other, Gumuz, Agew, Gamo, Highlands, Hadiya, Ometo-Gimira/Basketo, Nuer	18
Gabon	2012	kota-kele, other, nzabi-duma, shira-punu/vili, fang, myene, mbede-teke	7
Ghana	1993, 1998, 2008, 2014	akan, guan, ewe, ga/dangme, other, mole-dagbani, grussi, gruma	8
Guatemala	2015, 2014	ladina/mestiza, maya/other	2
Guinea	1999, 2018	peulh, malinké, soussou, kissi, other, guerzé	6
Guyana	2009	amerindian, mixed/other, indian, african	4
Honduras	2012, 2011	None, Other indigenous, Other, Maya chorti, Lenca	5
Ivory Coast	1994	Other nationality, Burkina-Faso, Ivorian	3
Kazakhstan	1999	Kazakh, Russian, Other	3

Table 6: Survey years and ethnic groups *(continued)*

Country	Survey years	Ethnic groups	N groups
Kenya	1999, 1998, 2003, 2009, 2008, 2014	kikuyu, meru/embu, luhya, luo, kamba, taita/taveta, other, somali, mijikenda/swahili, kisii, kalenjin, maasai, turkana, oromo/gabbra/borana	14
Liberia	2013	Other Kru, Grebo, Kpelle, Other Mande, Other, Bassa	6
Malawi	2000, 2004, 2005, 2010, 2016, 2015	other, tumbuka, tonga, nkondhe, ngoni, chewa, yao, sena, lomwe, mang'anja	10
Mali	1996, 1995, 2001, 2006, 2012, 2013, 2018	peulh, bambara, sarkole/soninke/marka, sonrai, other, malinke, senoufo/minianka, dogon, bobo, tamacheck	10
Moldova	2005	other, moldovan	2
Mozambique	1997, 2011	Makhuwa, Other, Sena, Tswa/Rhonga, Portuguese, Lomwe, Chewa, Changana, Chopi/Tonga, Shona/Ndau	10
Namibia	2000	other, kavango languages, oshiwambo, afrikaans, damara/nama, herero	6
Niger	1992, 1998, 2006	Other, Djerma, Peulh, Haoussa, Kanouri, Touareg/Touareg Bella	6
Nigeria	2008, 2013, 2018	Hausa, Other, Igbo, Yoruba, Fulani, Kanuri/Beriberi, Igala, Ibibio/Efik/Anaang, Tiv, Ijaw/Izon, Ekoi, Urhobo et. al	12
Pakistan	2012, 2013	Pushto, Punjabi, Siraiki, Other, Urdu, Barauhi, Sindhi, Balochi	8
Philippines	2003	tagalog, ilocano, cebuano, other, waray, other bisaya, ilonggo, bicolano, kapampangan, maguindanaon	10
Rwanda	1992	hutu, tutsi/other	2
Senegal	1993, 1997, 2005, 2011, 2010, 2014, 2015, 2016, 2017, 2018, 2019	Wolof, Other, Poular, Serer, Mandingue, Diola, Soninke	7
Sierra Leone	2008, 2013, 2019	Mende, Temne, Other, Mandingo, Limba, Loko, Kono, Creole, Sherbro, Fullah	10
South Africa	2016	black/african, white/coloured/other	2
Togo	1998, 2013, 2014	adja-ewe/mina, kabye/tem, para-gourma/akan, other, ana-ife, akposso/akebou	6
Uganda	1995, 2011, 2016	langi, alur-acholi, moru-madi, other, banyoro, banyankore, chiga, baganda, Ruanda-Rundi, masaba-luhya, batoro, teso-turakana, basoga, bagisu, Other Nyoro-Ganda	15
United States	2019	Black, White, Two or more races, Other Asian, American Indian, Other race, Chinese, Japanese	8

Table 6: Survey years and ethnic groups *(continued)*

Country	Survey years	Ethnic groups	N groups
Zambia	1996, 2002, 2001, 2007, 2013, 2014	lala-bisa, lunda, lozi, nsenga, chewa, mambwe-lungu, bemba, lenje-tonga, tumbuka, namwanga, luvale, ngoni, ushi, kaonde-nkoya, other, chokwe-luchazi, lamba, mbunda	18
Zimbabwe	1994	black, other, white	3