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Research Article

Shifting spousal age gaps in Kenya and Ghana: Does education matter?

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Contents

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Shifting spousal age gaps in Kenya and Ghana: Does education matter?

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Abstract

BACKGROUND

Spousal age gaps shape fertility, gender power dynamics, and female autonomy. While global trends show a decline, sub-Saharan Africa exhibits a high spousal age gap, particularly in relationships in which men are older. Averages alone can obscure these persistent inequalities, as high spousal age gaps have implications for gender equity and fertility transitions beyond shifts in the mean.

OBJECTIVE

This study examines high spousal age gap trends ($\geq$ 10 years) in Ghana and Kenya from 1990–1994 to 2020–2024 survey periods and evaluates the role of education in these shifts. Although these countries differ in sociocultural contexts, urbanisation trajectories, and education levels, both adopted universal primary education policies around the same time and have extensive Demographic and Health Surveys (DHS) data, offering valuable comparative cases.

METHODS

Using data from DHS, we apply a Kitagawa decomposition to distinguish the contributions of changes in the education-specific prevalence of high age gap from behavioural shifts within educational groups. This approach helps clarify how much of the overall decrease in age gaps is due to a larger educated population (compositional effect) versus people with the same education levels choosing similar-aged partners (behavioural effect).

RESULTS

Results show a decline in high spousal age gaps in both countries, though the underlying mechanisms differ. In Ghana, reductions were largely driven by the structural component,

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reflecting shifts in the education-specific prevalence of high-age-gap unions. In Kenya, declines were more behaviour-driven, indicating changes in partner-age selection within educational groups over time.

CONCLUSIONS

The findings suggest that male education plays an important role in partner selection, complementing the well-documented effects of female education on demographic transitions.

CONTRIBUTION

Understanding spousal age gap dynamics could inform policies aimed at improving reproductive autonomy and gender equality in sub-Saharan Africa.

1. Introduction

Spousal age gaps are a critical yet often overlooked demographic factor that influences fertility decisions, reproductive autonomy, child health, and gender power dynamics (e.g., Shephard 2019; Samuelsson 2020; Batyra et al. 2023). While global trends indicate a decline in age gaps between spouses, sub-Saharan Africa continues to exhibit some of the highest spousal age gaps (United Nations 2016; Feng and Ren 2022). These gaps are usually in unions in which men are older, and are often linked to patriarchal societies, thus reinforcing traditional gender roles (Carmichael 2011; Gustafson and Fransson 2015). Pronounced spousal age differences, especially gaps exceeding 10 years, are linked to lower contraceptive use, reduced female autonomy, and greater gender power imbalances (Shapiro and Gebreselassie 2014; Kyei and Bawah 2024). Despite global declines in spousal age gaps, the persistence of high spousal age gaps in which men are older (hereafter called ‘spousal age gaps’) in sub-Saharan Africa calls for a deeper exploration of their implications for fertility transitions, female autonomy, and power dynamics.

This study examines trends in the proportion of couples with high age gaps ($\geq$ 10 years) and mean spousal age gaps for Ghana and Kenya. The 10-year threshold for high spousal age gaps is widely used in demographic research as an indicator of substantial power imbalances in marriage (Lehmiller and Christopher 2008; Gustafson and Fransson 2015). This threshold also corresponds with the observed distribution (see Figure 1), where a marked rightward tail begins at 10 years, reinforcing its appropriateness as a cut-off. Previous studies on spousal age disparities in sub-Saharan Africa also apply this benchmark to assess gendered decision-making dynamics and reproductive autonomy (Samuelsson 2020; Kyei and Bawah 2024). Ghana and Kenya offer compelling comparative cases. Both countries adopted the universal primary education (UPE) policies around the same time, have relatively high levels of female education attainment compared to other sub-Saharan African countries, extensive Demographic and Health Survey (DHS) data, and differing sociocultural contexts. Ghana, a predominantly patrilineal society with a higher acceptance of polygyny, provides an opportunity to examine spousal age gaps in a more traditional setting. In contrast, Kenya, with lower polygyny prevalence and higher female literacy, offers insight into how educational and social transitions interact with partner selection behaviours (Nishimura et al. 2009; Bado, Guengant, and Maga 2022; Tabutin et al. 2020; Kramer 2020). The acceptance of polygamy is worth mentioning as societies that are more accepting of polygyny are likely to have larger spousal age differences (Seligson and McCants 2022). This may be because in the absence of multiple women to fulfil fertility desire, the hypothesised alternative would be to marry a younger woman to fulfil childbearing needs (Tertilt 2005). Thus, in the case of Ghana, which is more accepting of polygyny, and Kenya, less so, the hypothesis is that the spousal age gap would be lower in the less accepting country. However, polygyny itself is not accounted for in the analysis. The interest in Ghana and Kenya is to identify whether changes in spousal age gaps reflect structural factors (e.g., higher levels of education) or behavioural ones (e.g., changing partner preferences), and what these changes may mean for gender equity in union formation.

Prior research shows that female education influences fertility and marriage timing, contributing to lower fertility rates and shifting marriage patterns (Bongaarts 2010; Chae and Agadjanian 2022). Theoretical frameworks such as assortative mating and educational hypergamy provide insights into partner selection but are often based on low-fertility, high-income settings. The theory proposes that education may be linked to partner selection as individuals with similar education and socioeconomic backgrounds are more likely to partner with one another (Qian and Qian 2017; Qian 2017). Hypergamy is the concept that women 'marry up' in terms of education levels – that is, women are more likely to marry partners who are better educated than themselves. However, there is a growing change in this trend where the proportions of women in such marriages are declining, although there are some regional variations (Esteve, García-Román, and Permanyer 2012; Esteve et al. 2016). These declines may be due to the improvement and changes in the distribution of the gender structure by educational attainment brought about by more women attaining equal or higher levels of education than men (Lin, Desai, and Chen 2020). These educational shifts, alongside rising urbanisation and changing gender structures, among others, are central to the fertility transition theory, which posits that improvements in female education contribute to later marriages, smaller spousal age gaps, and lower fertility rates (Bongaarts 2010). This theory may also hold in sub-Saharan Africa.

Due to the association between education and fertility decline, numerous studies have examined the relationship between school reform programmes and fertility outcomes, mostly focusing on female education (Ferré 2009; Adu Boahen and Yamauchi 2018; Adu Boahen 2024; Goujon 2022). Existing research on spousal gaps, including sub-Saharan African countries, focuses on female education as a driver of fertility transitions and spousal age gap reduction (e.g., Lawson et al. 2021; Batyra, Kohler, and Furstenberg 2021). However, these perspectives overlook the role of male education in shaping partner selection. Educated men tend to delay marriage due to extended schooling, career development, and shifting economic expectations (Mansour and McKinnish 2014). This delay could potentially increase their exposure to age-similar women in professional and social networks, gradually weakening traditional hypergamous preferences for significantly younger spouses and encouraging opportunities for more age-symmetric (homogeneous) unions. This theoretical mechanism aligns with findings from Esteve et al. (2016) and Qian (2017), who show that prolonged education and shared institutional environments foster greater age and educational homogamy in partner selection. Additionally, male educational attainment enhances economic stability, reducing the reliance on conventional marriage patterns where older, wealthier men marry younger women (Quisumbing and Hallman 2005). Given that men in sub-Saharan Africa often play a more dominant role in reproductive and marital decisions (Abbani et al. 2024; Schoumaker 2019), shifts in male education levels can significantly reshape partner selection and gender power dynamics.

The study employs demographic decomposition techniques, specifically a decomposition similar to Kitagawa's (1955), to examine how education-specific prevalence of high-age-gap unions and within-education changes in mean age gaps contribute to altering the spousal age gap in these countries. Kitagawa decomposition is particularly well-suited for this study as it helps distinguish whether observed changes in age gaps are primarily due to changes in the education-specific prevalence of high-age-gap unions or evolving preferences for partner age gaps within educational categories. Studying these countries helps evaluate whether increasing education levels contributes to reducing spousal age gaps. Thus, the research questions are as follows:

1. How have spousal age gaps changed in Ghana and Kenya from 1990–1994 to 2020–2024 survey period?
2. Does male education play a stronger role in reducing high age gaps than female or the couples' joint educational combinations?
3. To what extent do changes in educational composition versus partner selection behaviours explain the changes in the mean spousal age gap?

This study offers a nuanced understanding of gender power dynamics by shifting attention from mean spousal age gaps to extreme disparities ($\geq$ 10 years). Reducing spousal age gaps is important not only for promoting gender equity within marriage but also for improving reproductive autonomy, communication, and shared decision-making in unions. Narrow age gaps are associated with more egalitarian household dynamics and better health outcomes for women (Carmichael 2011; Adebowale 2018).

2. Background

Shifts in spousal age gaps are crucial indicators of fertility transitions, which are shifting from high to low fertility rates. Larger spousal age gaps, especially during early stages of fertility transitions, reflect traditional gender hierarchies and norms favouring early marriage for women and delayed marriage for men (Lee 2002; Lesthaeghe 2014; Van Zanden 2011). While most world regions are experiencing later ages at union and a corresponding closer gender gap, sub-Saharan Africa is amidst a transition characterised by early marriage, childbearing and significant gender gaps (Frejka 2010; Bongaarts and Blanc 2015; Church et al. 2023). In sub-Saharan Africa, expansion in education led to increases in age at marriage for women, where early marriage was a long-standing norm (Shapiro and Gebreselassie 2014; Garenne 2004). Despite these changes, the region has one of the highest spousal age gaps (Bongaarts, Mensch, and Blanc 2017; Ausubel et al. 2022). The persistent high age gaps in sub-Saharan Africa may be attributed to entrenched social norms that view significant spousal age differences as acceptable or desirable (Hertrich 2017). Furthermore, from a viewpoint of evolutionary biology and social anthropology, men are more likely to marry younger women for a variety of reasons, ranging from younger women having longer childbearing ages for more children, to care in older ages (Gustafson and Fransson 2015; Mignot 2010). Although hypergamy was introduced conceptually, our analysis could not test its decline directly due to small sample limitations. Nonetheless, the observed narrowing of age gaps is consistent with broader shifts in educational assortative mating reported in other studies.

In women, education, particularly higher education, plays a role in delaying union formation through various mechanisms. Since higher education takes time, women usually postpone entering unions and having their first children until completing school (Schultz 1997). As more women in society attain higher education levels and experience delayed union formation, other lesser-educated individuals follow this behavioural pattern, and this slowly transforms an early marriage society into a later one (Kravdal 2002, 2001; Adhikari, Lutz, and Kebede 2024). Furthermore, changes in the female educational composition led to increases in the mean age at first marriage (Bongaarts, Mensch, and Blanc 2017; Garenne 2004). Inasmuch as education delays marriage among women, highly educated men are as likely to delay marriage (Quisumbing and Hallman 2005; Dudel, Cheng, and Klüsener 2023; Mooyaart, Liefbroer, and Billari 2022; Keldal and Şeker 2022). However, the impact of education on men regarding age at marriage is not as strong as for women (Marini 1978).

In men, delaying marriage usually stems from the pressure to provide economic security, thus reflecting in the historically older ages at which men marry (Mensch, Singh, and Casterline 2005). The financial opportunities presented, at least for men with higher education, contribute to delays in marriage while increasing economic possibilities (Musick, Brand, and Davis 2012). These patterns intersect with gendered power dynamics.

When only men are more educated and older, traditional power structures may be reinforced. It is unclear how this relationship changes the high-age-gap proportions in sub-Saharan Africa and the contribution of these education levels to the overall changes in the spousal age gap. In this regard, while answering the outlined research questions, the study checks whether men and women and indeed couples with higher levels of education (secondary or more) have smaller spousal age gaps than other groups.

Although Ghana and Kenya implemented UPE reforms along the same periods, as part of broader efforts to improve access to basic education (Nishimura et al. 2009; Babalola 2013), their sociocultural, demographic, and economic trajectories have diverged considerably. For instance, the attitudes surrounding polygyny are far more favourable in Ghana compared to Kenya, highlighting the more patrilineal outlook of Ghana versus Kenya (Kramer 2020). The generally favourable outlook of polygyny encourages men to marry younger women at later ages, leading to higher age gaps (Hertrich 2007). Thus, spousal age gaps may be higher in Ghana than in Kenya. Furthermore, literacy is significantly higher in Kenya than in Ghana; meanwhile, East and Southern Africa record higher proportions of educated individuals than West and Central Africa (Smith-Greenaway 2015). The disparity in educational composition and the varying polygyny prevalence between Ghana and Kenya merit a comparative study. Given these contextual differences, studying historical and recent educational reforms in these countries may be useful in examining how these reforms have influenced marriage patterns and spousal age gaps. By comparing the two, this study gains insight into how structural versus behavioural change may play out in these diverse settings.

3. Data and methods

3.1 Data

This study uses the Kenyan and Ghanaian Demographic and Health Surveys (DHS) from 1990 to 2022 (DHS 2023). The analysis groups the individual survey years into five-year survey periods for comparability. The survey periods are 1990–1994, 1995–1999, 2000–2004, 2005–2009, 2010–2014, and 2020–2024.[3] The DHS survey years included for Ghana are 1993, 1999, 2003, 2008, 2014, and 2022 and for Kenya, 1993, 1998, 2003, 2009, 2014, and 2022. The study focuses only on married couples and those living in unions within the couples' recode file for standard DHS surveys. This particular DHS file is suitable for the analysis because the couples in the files are pre-matched, reducing the risk of misreported ages. This approach avoids biases common in the women's data

[3] To make it easier to compare the countries and due to a one-year difference in some survey years for Kenya and Ghana, the years are grouped; furthermore, each survey year falls within the corresponding five-year survey period.

(individual recode), where women report both their age and their partner's age, often underestimating the partner's age compared to couple-reported data (Schoumaker 2014).

The main aim of this study is to identify the role of education in shifting spousal age gaps; thus, the study collects data by level of education. The educational categories used for both men and women are none, primary, and secondary+. The none and primary groups follow the exact definitions of the DHS, while the secondary+ combines the secondary and higher education groups due to small sample size. The analysis does not distinguish between different types of unions – that is, polygynous or monogamous. First, the study calculates these measures, mean spousal age gaps and above 10-year couple proportions, by only female education (all female sample who are in a union), then by only male education (all male sample who are in a union), then the joint educational pairing of spouses – that is, the specific combination of each partner's education level. Some joint educational pairings, particularly those involving highly educated women and lower educated men in earlier waves, contain relatively few observations. These small cell sizes can increase the variability of average spousal age gap estimates, especially in decomposition components. Such results need cautious interpretation. The study derives the spousal age gap for each country by taking the difference between the men's and women's ages at the time of the survey for each observation from the couples' recode files.

To ensure robustness, the study excludes 2,616 (about 10% in Figure A-1) couples where the woman had a secondary education and the man had no education or primary education. Thus, there were 23,322 couples for the overall mean spousal age gap calculations, of which 8,951 were from Ghana and 14,371 from Kenya. The mean spousal age gap calculations include all age differences, even negative age gaps, in the sample. However, the proportions focus on only age gaps above 10 years.

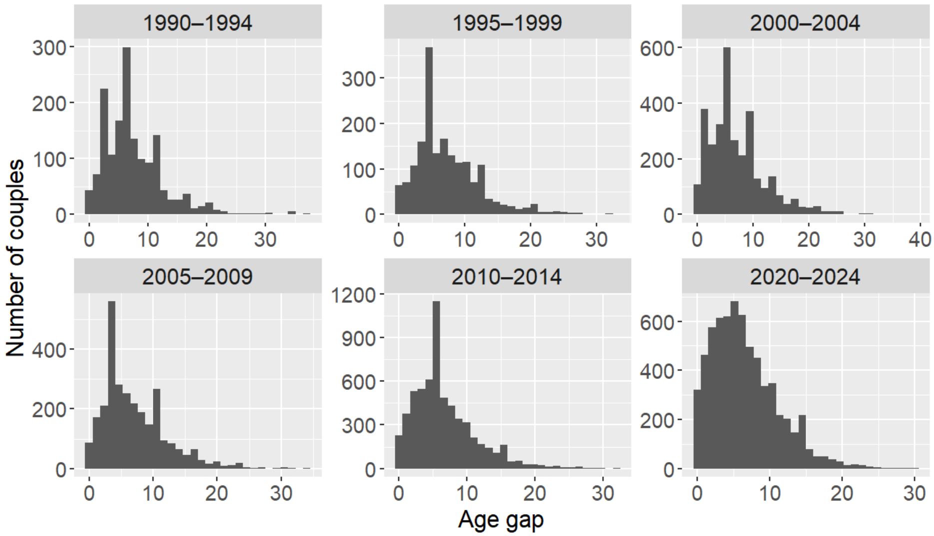
Table 1 presents the remaining sample by survey period, country, and the partnered couples' educational groups. These groups are the joint education of the couples (that is, the individual man and woman's education in the couple unit).

Table 1: Sample by joint educational combinations of couples, period, and country

Country	Male education	Female education	1990–1994	1995–1999	2000–2004	2005–2009	2010–2014	2020–2024	Total
Ghana	None	None	164	206	674	416	404	610	2,474
	Primary	None	82	28	153	130	105	132	630
		Primary	162	25	73	57	91	91	499
	Secondary+	None	17	85	227	203	169	243	944
		Primary	63	60	242	243	210	256	1,074
		Secondary+	22	185	606	652	674	1,191	3,330
Total			510	589	1,975	1,701	1,653	2,523	8,951
Kenya	None	None	85	48	134	107	368	400	1,142
	Primary	None	173	140	86	70	252	203	924
		Primary	472	526	539	537	2,094	1,504	5,672
	Secondary+	None	17	17	28	24	47	82	215
		Primary	216	270	232	244	820	678	2,460
		Secondary+	188	265	301	316	1,143	1,745	3,958
Total			1,151	1,266	1,320	1,298	4,724	4,612	14,371

A high age gap in this study refers to the difference in couples' ages greater than or equal to 10 years. Figure 1 shows the distribution of the couples in our final sample by positive age gaps (greater than zero) for both countries. The country-specific estimates consider the survey weights through the svydesign function of the survey package within R statistical software (Lumley 2020). Using the svyby function within the survey package, the study derives the mean spousal age gap and the proportion of couples with a high age gap by country and survey period.

Figure 1: Distribution of couples by spousal gap



3.2 Methods

This study calculates the trends in spousal age gaps, including high age gaps in Ghana and Kenya across survey periods. Furthermore, it quantifies, through a decomposition approach, the contributions of compositional and behavioural changes to spousal age gaps within educational levels. The study follows a descriptive approach and presents the mean spousal age gaps and proportions of couples with high age gaps (≥ 10) by country on average and by level of education. Additionally, the study analyses percentage changes in the variables between the first and last five-year survey periods. The percentage changes also include the estimations by level of education. This change for each country is as follows:

$$\Delta E_{t_{1,e}-t_{0,e}}\% = \frac{E_{t_{1,e}} - E_{t_{0,e}}}{E_{t_{0,e}}} \cdot 100\%,$$

$$\Delta E_{t_1-t_0}\% = \frac{E_{t_1} - E_{t_0}}{E_{t_0}} \cdot 100\%. \quad (1)$$

In Equation 1, the variable E represents the estimate of interest, either the mean spousal age difference or the proportion of couples with age gaps above 10 years. Furthermore, t_0 is the first survey period, 1990–1994, and t_1 is the latest survey period (2020–

2024), and e is the respective education level. In addition to the percentage change, the study also calculates the absolute change of the measures of interest for each country, $E_{t_1} - E_{t_0}$. The absolute change is also by education levels. This is included to provide a more comprehensive overview of changes, particularly for small subgroups.

Another aim of the study is to understand whether changes in the spousal age gap are attributable to shifts in the composition or behaviour of distinct educational groups within Kenya and Ghana. The decomposition analysis is performed for each of the three folds of education – women's, men's, and couples' joint educational combinations. Utilising a Kitagawa (1955) demographic decomposition technique and following Beaujouan, Zeman, and Nathan (2023), the study further decomposes the observed period differences for each country into contributions of differences in educational composition and within education group differences as

$$\begin{aligned}
\Delta M_{t_1-t_0} = \quad & \underbrace{\sum_e (P^e_{\geq 10,t_1} - P^e_{\geq 10,t_0})\bar{M}^e_t}_{Structural\ effect} + \underbrace{\sum_e (M^e_{t_1} - M^e_{t_0})\bar{P}^e_{\geq 10,t}}_{Rate\ effect}, \\
\bar{M}^e_t = \quad & \frac{M^e_{t_0} + M^e_{t_1}}{2}, \\
\bar{P}^e_{\geq 10,t} = \quad & \frac{P^e_{\geq 10,t_0} + P^e_{\geq 10,t_1}}{2}. \qquad (2)
\end{aligned}$$

The Kitagawa decomposition allows the separation of changes in spousal age gaps to shifts in the educational composition of the population versus changes in behaviour within educational groups. For instance, it helps explain if the overall age gap decreases because of changes in the education-specific prevalence of high-age-gap unions (compositional effect) or because of changes in mean age gaps within education categories over time (behavioural effect). In Equation 2, $\Delta M_{t_1-t_0}$ is the change in mean spousal age gap for either Ghana or Kenya between 2020–2024, t_1, and 1990–1994 t_0. M^e_t is the high-age-gap-adjusted mean spousal age gap by each education level, and $\bar{M}^e_t$ is the average of the mean spousal age gaps of 2020–2024, t_1, and 1990–1994, t_0 for each educational level. $P^e_{\geq 10,t}$ represents the proportion of couples with 10 or more years age gap by level of education, while $\bar{P}^e_{\geq 10,t}$ is the average proportion of couples with an age gap above 10 years between the two survey periods by level of education.

The decomposition equation described considers the contribution of changes in the proportion of couples with high spousal age gaps to the differences in mean spousal age gaps. It also examines the changes in the educational levels of these measures to the overall differences in mean spousal age gap. The structural effect (compositional effect) of Equation 2 shows the contribution of the changes in the structure (distribution) of couples with a higher or equal to 10 years of age gap to the overall changes in mean spousal age gap by level of education. On the other hand, the rate effect or behavioural effect is the contribution of the changes in the patterns or behaviour of the proportion of couples with an age gap equal to or above 10 years within the levels of education to the shifts in spousal age gaps. While Oaxaca–Blinder decomposition is often used to decompose differences in continuous outcomes, its application to demographic outcomes like spousal age gaps, which include both continuous (mean spousal age gap) and categorical components, can introduce challenges in interpretation. Kitagawa decomposition, in contrast, is a well-established demographic method that more precisely isolates the contributions of structural (education-specific prevalence of high age gap) and behavioural (within-group changes) effects in spousal age gap trends. Given the study's focus on these two specific contributions, we employ Kitagawa decomposition as the most appropriate technique for this analysis.

4. Results

4.1 Shifts in spousal age gap

Figure 2 shows the trends in the mean spousal age gaps across the five-year survey periods for Ghana and Kenya. The mean spousal age gap is declining in Ghana and Kenya across survey periods. Overall, the means observed in Ghana are consistently higher than in Kenya at any period.

Figure 2: Mean spousal age gaps trends in Ghana and Kenya

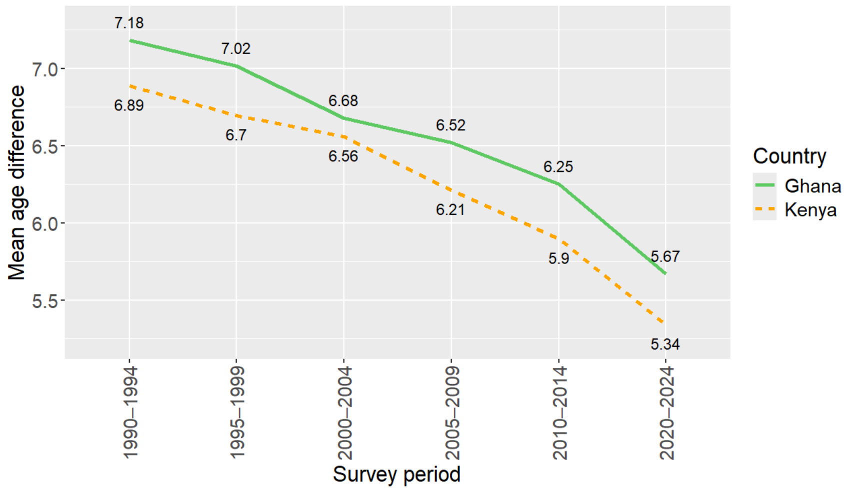
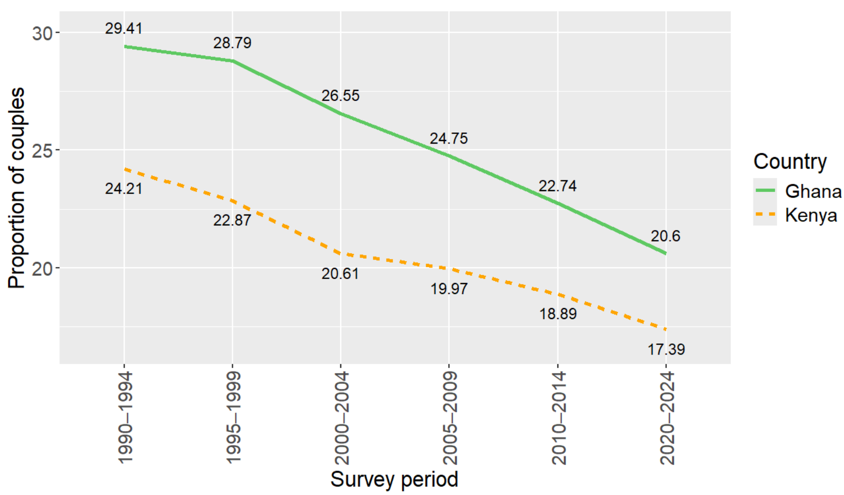


Figure 3 presents the proportion of couples with a 10-year or more spousal age gap in Ghana and Kenya.

Figure 3: Trends in couples proportion with high age gaps in Ghana and Kenya

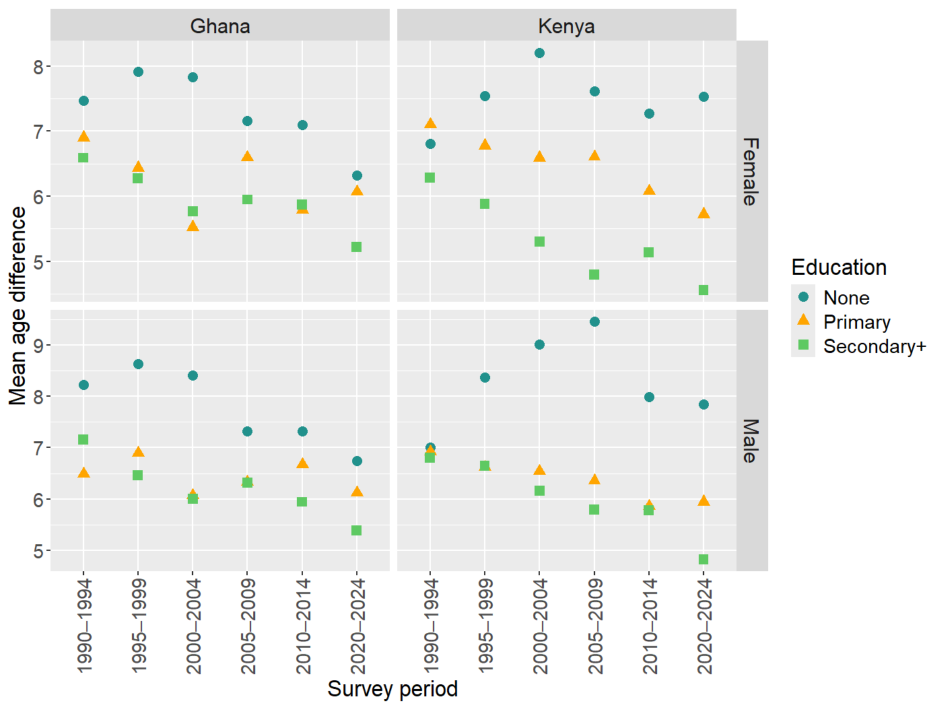


Similar to the means, the proportion of couples with a high age gap is reducing across both Kenya and Ghana. Kenya again has the lower proportion of couples with a high age gap across all periods. The proportions in Ghana, however, declined steeper by the last survey period compared to Kenya. Nevertheless, the proportions in Ghana were consistently above 20%, even in the latest survey.

4.2 Trends in mean age gap by levels of education

Figure 4 shows the trends in mean spousal age gap by the individual male and female levels of education for Ghana and Kenya.

Figure 4: Mean spousal age gaps among individuals currently in a union by education and gender

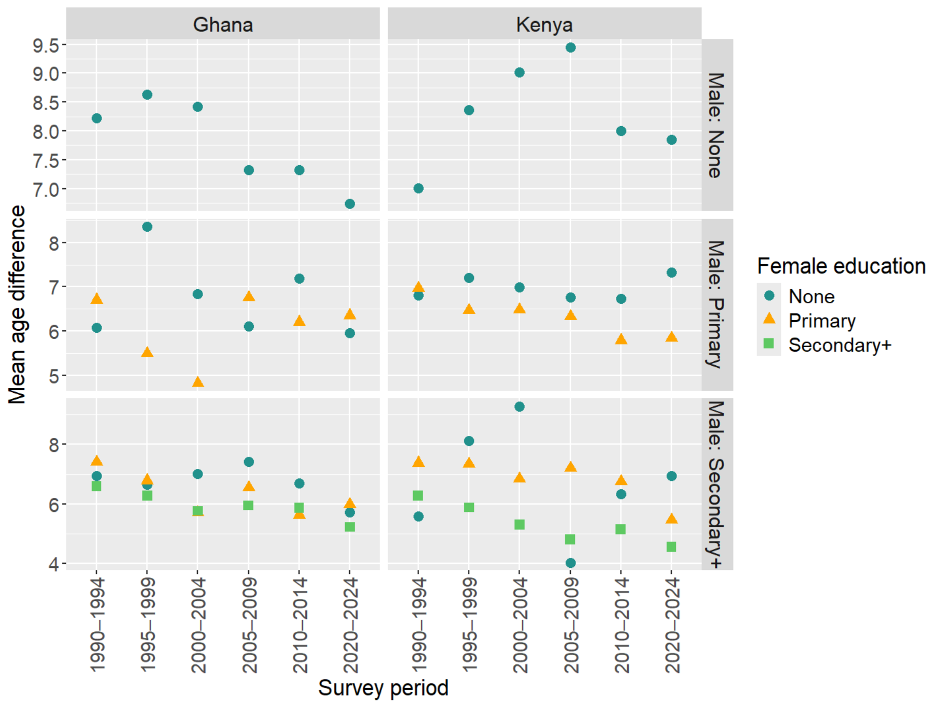


Note: Data are presented separately for men and women, not couple-level dyads.

Aside from both males and females with no education in Kenya, the mean spousal age gap declined for other education levels across the countries and survey periods. The trends by female education are generally lower (aside from women without education) in Kenya than in Ghana.

Figure 5 depicts the trends in mean spousal age gap by the individual male and female levels of education for Ghana and Kenya.

Figure 5: Mean spousal age gaps among couples by joint educational combinations



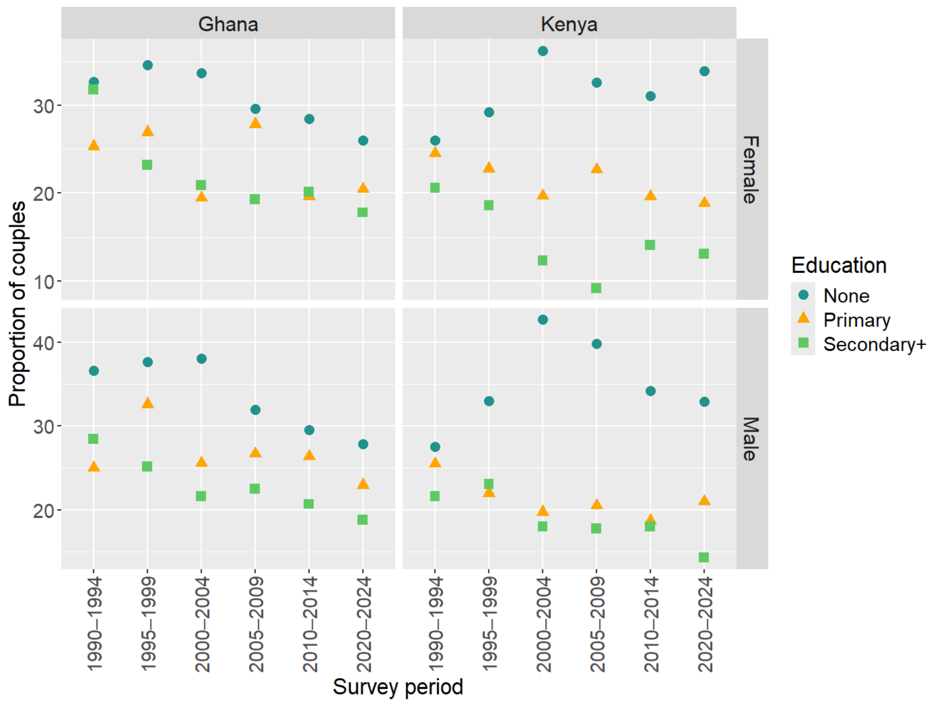
Note: Data are presented for couple-level dyads.

While there appears to be an increasing trend in the mean spousal age gap for men without education and their partners (also with no education) in Kenya, all other couples' joint educational combinations experienced declines across survey periods, albeit with varying degrees. In Kenya, men with secondary and higher education levels appear to generally have lower mean spousal age gaps with their partners than men with primary education. The trends in the mean spousal age gap in Ghana for men with secondary education and higher and their partners are generally declining. However, this decline is not visible among men with primary education and their partners.

4.3 High age gap by levels of education

Figure 6 shows the proportion of couples with a high age gap by only male and female levels of education.

Figure 6: Proportion of individuals currently in a high-age-gap union by country and education

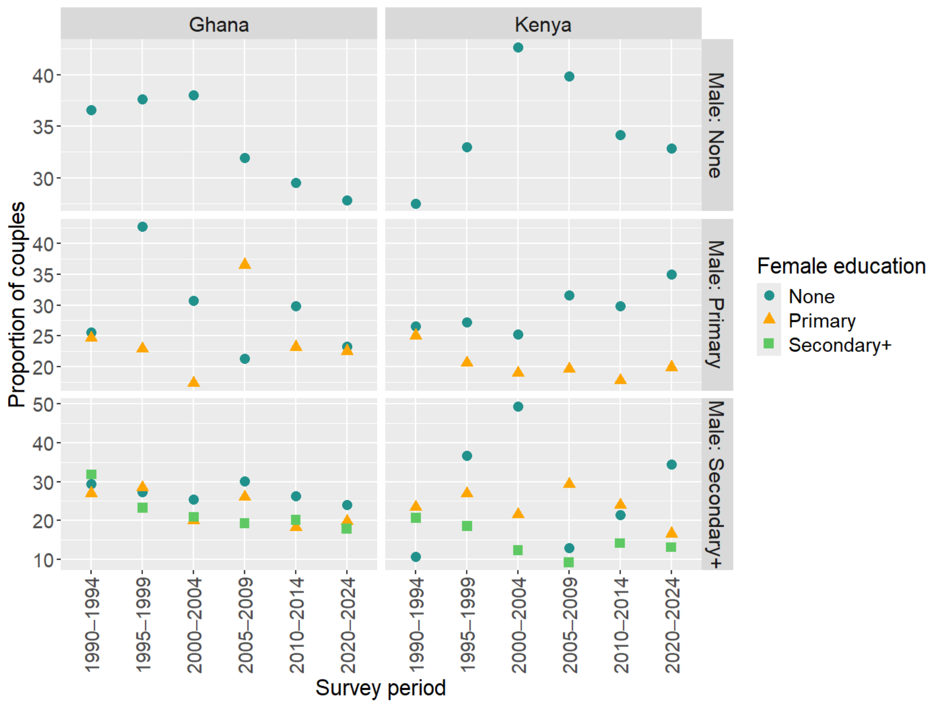


Note: Data are presented separately for men and women, not couple-level dyads.

In both countries, the proportion of couples for female education is lower than for male education. The proportion of high-age-gap couples by education levels is overall considerably lower in Kenya than in Ghana. In Ghana, the high-age-gap-couple proportion is declining by most levels of education; however, by male education, there is a sharper decline among men with no education than other groups. Meanwhile, in Kenya, there is a slight increase in the high-age-gap-couple proportion by males and females with no education, while the proportions are declining for all other education levels.

Figure 7 displays the proportion of couples with a high age gap by the couple's education levels. The figure shows the proportion by the male partner's level of education and the points representing their corresponding spouse's education level.

Figure 7: Proportion of couples currently in a high-age-gap union by country and joint educational combinations



Note: Data are presented for couple-level dyads.

Overall, men with secondary and higher education have the lowest proportions of high-age-gap partnerships, followed by men with primary education, then those without education. However, there are different emerging trends by the couples' joint educational combinations. While in Kenya, the trend of high-age-gap-couples for men with primary education is increasing with women with no education, there is a decline in the trend for partnerships with primary-educated women. Meanwhile, the trend in the high-age-gap-couple proportions is decreasing among couples with no education in Ghana.

4.4 Absolute and percentage changes in age gap quantities

Table 2 presents the percentage changes in mean spousal age gap and high-age-gap couple' proportions in Ghana and Kenya. These figures follow the results of Equation 1. Both Kenya and Ghana experienced declines in spousal age gaps. In Ghana, the mean spousal age gap fell by about 21% between 1990–1994 and 2020–2024, while the proportion of couples with high age gaps dropped by around 30%. Kenya followed a similar trend, reducing the mean spousal age gap from 1990–1994 to 2020–2024 by 22% and the proportions of couples with high age gaps by 28%. These declines indicate that changes in education and partner preferences were consistent across both countries. Although both countries experienced significant reductions in the mean spousal age gap and higher age gap proportions, Ghana had more declines in the proportions of couples with high age gaps than Kenya.

Table 2: Percentage change in mean spousal and high-age-gap proportion

Country	Estimate	1990–1994	2020–2024	Absolute change	Percentage change
Ghana	Mean spousal gap	7.18	5.67	–1.51	–21.03%
	High gap proportion	29.41%	20.60%	–8.81%	–29.96%
Kenya	Mean spousal gap	6.89	5.34	–1.55	–22.49%
	High gap proportion	24.21%	17.39%	–6.82%	–28.17%

The study adopts three strategies to determine the role of education: focus on male education, female education, and couples' joint educational combinations. Table 3 presents the percentage change of the mean spousal age gap and the proportion of couples with a higher age gap by the different levels of education.

Table 3: Absolute and percentage changes in estimates by different education levels

Country	Sex	Female education	Male education	M_{t_0}	M_{t_1}	ΔM	$\%\Delta M$	$P_{\geq 10 t_0}$	$P_{\geq 10 t_1}$	$\Delta P_{\geq 10}$	$\%\Delta P_{\geq 10}$
Ghana	Female	None		7.47	6.33	–1.14	–15.30	32.70	26.03	–6.67	–20.39
		Primary		6.90	6.07	–0.83	–12.02	25.33	20.46	–4.87	–19.23
		Secondary+		6.59	5.22	–1.37	–20.77	31.82	17.81	–14.01	–44.03
	Male	None		8.22	6.74	–1.48	–17.97	36.59	27.81	–8.77	–23.98
		Primary		6.49	6.12	–0.37	–5.65	25.00	22.93	–2.07	–8.27
		Secondary+		7.16	5.39	–1.77	–24.73	28.43	18.80	–9.63	–33.88
	Couple	None	None	8.22	6.74	–1.48	–17.97	36.59	27.81	–8.77	–23.98
		None	Primary	6.07	5.95	–0.12	–1.96	25.61	23.26	–2.35	–9.19
		Primary	Primary	6.70	6.35	–0.35	–5.26	24.69	22.51	–2.18	–8.84
		None	Secondary+	6.94	5.72	–1.23	–17.66	29.41	24.07	–5.34	–18.16
		Primary	Secondary+	7.41	5.99	–1.43	–19.25	26.98	19.82	–7.16	–26.55
		Secondary+	Secondary+	6.59	5.22	–1.37	–20.77	31.82	17.81	–14.01	–44.03
Kenya	Female	None		6.81	7.53	0.72	10.63	26.00	33.88	7.88	30.31
		Primary		7.10	5.72	–1.38	–19.44	24.52	18.88	–5.64	–23.01
		Secondary+		6.28	4.56	–1.73	–27.47	20.59	13.08	–7.51	–36.46
	Male	None		7.00	7.85	0.84	12.02	27.52	32.89	5.36	19.49
		Primary		6.93	5.94	–0.98	–14.17	25.46	20.97	–4.49	–17.62
		Secondary+		6.81	4.83	–1.98	–29.10	21.63	14.30	–7.33	–33.90
	Couple	None	None	7.00	7.85	0.84	12.02	27.52	32.89	5.36	19.49
		None	Primary	6.81	7.33	0.52	7.65	26.53	34.96	8.43	31.78
		Primary	Primary	6.97	5.84	–1.13	–16.24	25.05	19.91	–5.14	–20.52
		None	Secondary+	5.60	6.94	1.34	24.01	10.71	34.45	23.74	221.69
		Primary	Secondary+	7.38	5.46	–1.92	–25.99	23.39	16.57	–6.82	–29.15
		Secondary+	Secondary+	6.28	4.56	–1.73	–27.47	20.59	13.08	–7.51	–36.46

In Ghana, the mean spousal age gap and proportion of couples with a high age gap declined across the different levels of education. On average, declines in the mean spousal age gap were more pronounced by male education than female education in both Ghana and Kenya. However, overall, there were more reductions in age gap proportions by female education than compared to male education. While in Kenya, other education groups experienced declines in mean spousal age gap and high-age-gap proportion; it was men and women with no education who experienced increases in these measures. The proportion of high-age-gap couples where men had secondary and higher education yet their spouses had no education more than doubled by the last survey period. However, in Ghana and Kenya, males, females, and couples with secondary or higher education experienced the most declines in mean spousal age gap and high-age-gap proportions.

4.5 Decomposition of spousal age differences

This study assesses the role of changes in the proportion of couples with high age gaps by levels of education to shifts in the mean spousal age gap. The study applies the formula in Equation 2 to mean spousal age gap, focusing on male education, female education, and couples' joint educational combinations. Figure 8 and Table 4 illustrate that the drivers of spousal age gap reduction differ between Ghana and Kenya.

Figure 8: Decomposition results by education levels, Ghana and Kenya

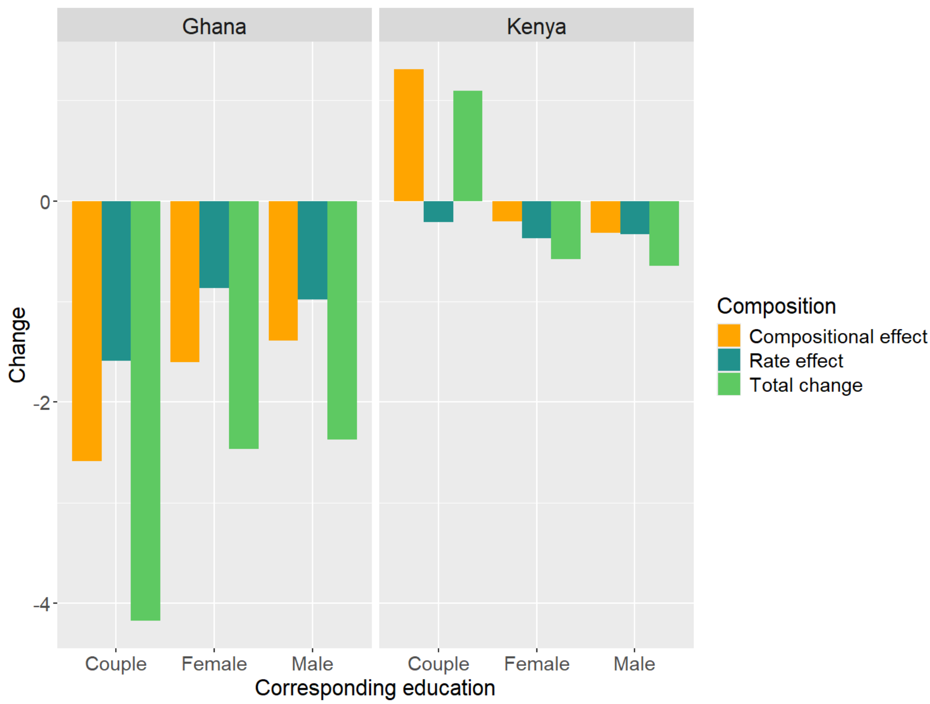


Table 4: Components of decomposition by education levels

Country	Education by	Male education	Female education	Structural effect	Rate effect
Ghana	Couple	None	None	–0.66	–0.48
		Primary	None	–0.14	–0.03
			Primary	–0.14	–0.08
		Secondary+	None	–0.34	–0.33
			Primary	–0.48	–0.33
			Secondary+	–0.83	-0.34
			Total	**–2.59**	**–1.59**
	Male	None		–0.66	–0.48
		Primary		–0.13	–0.09
		Secondary+		–0.60	–0.42
			Total	**–1.39**	**–0.982**
	Female		None	–0.46	–0.34
			Primary	–0.32	–0.19
			Secondary+	–0.83	–0.34
			Total	**–1.60**	**–0.865**
Kenya	Couple	None	None	0.40	0.25
		Primary	None	0.60	0.16
			Primary	–0.33	–0.25
		Secondary+	None	1.49	0.30
			Primary	–0.44	–0.38
			Secondary+	–0.41	–0.29
			Total	**1.31**	**–0.211**
	Male	None		0.40	0.25
		Primary		–0.29	–0.23
		Secondary+		–0.43	–0.36
			Total	**–0.317**	**–0.329**
	Female		None	0.57	0.22
			Primary	–0.36	–0.30
			Secondary+	–0.41	–0.29
			Total	**–0.203**	**–0.373**

In Kenya, behavioural changes within educational groups account for a larger share of the decline, meaning that partner selection patterns have shifted toward smaller age gaps. This suggests that in Kenya, age-gap patterns shifted primarily within education groups. In Ghana, structural changes, particularly increasing male education levels, appear to be associated with the decline in spousal age gaps. In other words, Ghana's age gap decline is mainly associated with the structural component, reflecting shifts in the education-specific prevalence of $\geq$ 10-year-gap unions, while in Kenya's case, it is mostly due to men changing their preferences regardless of education level. This key distinction highlights why policy approaches in each country may need to differ.

Altogether, the changes in the proportion of couples with high age gaps contributed to reductions in mean spousal age gaps across subregions and by the different partner's level of education. In Kenya, for males, females, and couples with no education, the contributions by behavioural and compositional changes were positive, which led to increases in the spousal age gap. Meanwhile, in Ghana, for the same groups, the contributions of both structural changes and behavioural changes led to reductions in mean spousal age gaps. While in Ghana the changes in the proportion of couples with high age gap (structural effect) led to considerable reductions in mean spousal age gap than the behaviours of the couples (rate effect), in Kenya, aside from the couple's education levels, the reductions in the mean spousal age gaps were primarily due to changes in the behaviour of males and females.

5. Discussion and conclusion

This study focuses on spousal age gaps with an interest in high-age-gap couples in Ghana and Kenya to fill an underexplored but pivotal gap in the literature. These patterns matter in how they reshape women's bargaining power, reproductive autonomy, and the broader conditions for gender-equitable unions (Barbieri, Hertrich, and Grieve 2005; Feng and Ren 2022). The study finds that reductions in the spousal age gap and the proportion of couples with a high age gap differ between Ghana and Kenya. This section discusses the key findings in light of the three central research questions: decline of spousal age gaps over time, the extent to which these changes are compositional versus behavioural, and the role of male and female education levels in driving these shifts. Our results indicate that while the structural component (changes in the education-specific prevalence of high-age-gap unions) plays a major role, broader factors – such as the decline in educational hypergamy and the reduced prevalence of polygynous unions – may also underlie the observed narrowing of spousal age gaps. These mechanisms, though not fully captured in our analysis, align with fertility transition theory and the growing evidence of changing partner selection norms in sub-Saharan Africa (Kyei et al. 2025).

Consistent with Hertrich (2017), our findings show that Ghana experienced overall higher mean spousal age gaps than Kenya. Kenya's spousal age gap was already lower at the start, implying that further reductions depended more on shifting social norms rather than educational expansion alone. This contrast suggests that education-focused policies may be more effective in Ghana, while in Kenya, initiatives targeting partner selection norms, such as gender-equitable messaging in educational settings or professional environments, may be helpful in further reducing spousal age gaps (Levy et al. 2020; Mmari, Simon, and Verma 2024; Viitanen and Colvin 2015). However, these are proposed mechanisms on the drivers of these changes, and other study designs, outside the scope of this study, could validate these mechanisms. In addition, the proportion of men and women with secondary and higher education levels with a partner age gap of more than 10 years is generally lower than other educational groups across both countries. Furthermore, there is a more significant proportion of couples with a high age gap (10 years or more) in Ghana than in Kenya. Similarly, across levels of education, by male and female education and couples' joint educational combinations, individuals with secondary or higher education experienced the lowest mean spousal age gaps in Ghana and Kenya.

The study decomposes the mean spousal age gap across two survey periods 2020–2024 and 1990–1994, by education level to examine the role of education and the proportion of couples with a high age gap to changes in the spousal age gap in Ghana and Kenya. These periods cover the introduction and implementation periods of educational reforms from the 1980s to the late 2000s, encompassing multiple variations of the UPE. The observed increase in secondary or higher education attainment, particularly among men in Ghana, aligns with the long-term effects of the UPE reforms implemented in the early 2000s. These reforms may have coincided with both compositional and behavioural shifts observed in our decomposition analysis. In Ghana, declines were structurally driven, as increased male educational attainment coincided with structural shifts in the education-specific prevalence of high-age-gap unions. In Kenya, however, changes were primarily behavioural, reflecting evolving partner selection norms rather than just rising education levels.

These results are consistent with the notion that Ghana's overall decline is more structurally driven, while Kenya's decline is more rate/within-group driven. Importantly, the structural component here reflects shifts in the education-specific prevalence of high spousal age-gaps. Additionally, continued urbanisation and shifting economic structures may play an indirect role in reinforcing these trends. The behavioural shifts in Kenya may stem from broader exposure to mass media, evolving gender norms, urbanisation, and increased interaction in educational and professional environments. These shifts likely affect perceptions of ideal partner characteristics and reduce preferences for large age gaps (Bongaarts 2017; Tabutin et al. 2020). Beyond urbanisation, shifting cultural norms regarding marriage timing and partner selection may also contribute to Kenya's behavioural changes. Increased exposure to globalised media, economic empowerment of women, and legal reforms promoting gender equity in marriage may have reinforced declining preferences for large spousal age gaps (Kyei and Bawah 2024; Iacoella, Gassmann, and Tirivayi 2022; Schoumaker 2019). These findings suggest that both educational expansion and shifts in partner preferences may contribute to narrowing spousal age gaps. However, our descriptive analysis cannot establish causality, and any policy implications should be interpreted cautiously and in conjunction with broader societal factors.

Recent studies suggest a decline in hypergamous marriages as gender gaps in education narrow, leading to more age-similar partnerships (Esteve et al. 2016; Lin, Desai, and Chen 2020). The findings in Kenya align with this broader trend, indicating that behavioural shifts in partner selection may be linked to declining societal preferences for significant spousal age differences (Amoo 2020). In Ghana, the starting levels of spousal age gaps were higher, meaning any shift in education distribution could lead to larger reductions. Unlike Kenya, where behavioural shifts contributed significantly to spousal age gap declines, Ghana's reductions were primarily structural. This may be due to the stronger persistence of traditional marriage customs, where older male spouses remain socially preferred despite rising education levels. Additionally, as more Ghanaian men attain higher education, they may encounter partners similar in age in urban and professional settings, leading to a gradual decline in hypergamous marriages. In contrast, Kenya's lower initial spousal age gaps meant less room for drastic structural shifts, making behavioural changes (e.g., shifting partner preferences) the primary driver of declines. Beyond education, concurrent changes such as urbanisation, globalisation, increased access to contraceptives, and gender-equitable messaging in schools and workplaces likely shaped marriage dynamics (Cleland, Ndugwa, and Zulu 2011; Ahmed et al. 2019). These factors may interact with educational expansion to accelerate reductions in spousal age gaps.

While the study provides valuable insights into the role of education in changing the spousal age gap among couples in Ghana and Kenya, it has limitations. The limitation that arises in the methodology is that the Kitagawa decomposition does not permit a more complex analysis of other factors that could influence the spousal age gap, such as religion or the type of marital union, whether polygamy or monogamy. Furthermore, the study does not distinguish between monogamous and polygynous unions, which are known to be associated with larger spousal age gaps. However, these determinants were outside the scope of this study. The study aimed at looking at all spousal connections and not particularly focusing on union types. Despite the limitations, the study offered some understanding of the role of education in reducing spousal age gaps in Ghana and Kenya. The results of this study contribute to the slow but growing research on determinants of fertility with an emphasis on males in sub-Saharan Africa, highlighting the need to involve men in sub-Saharan Africa in matters concerning fertility (Batyra, Kohler, and Furstenberg 2021; Schoumaker 2017).

Although educational hypergamy is discussed conceptually, the data are not conducive for a direct analysis of shifting hypergamy trends due to limited sample sizes in some joint education categories as seen in Figure A-1. Future research may explore this in greater depth. Because polygynous unions typically involve older husbands, their inclusion likely inflates observed spousal age gaps. Distinguishing polygynous from monogamous unions in future work would provide clearer evidence of their specific contribution. Furthermore, estimates for highly educated women in earlier survey periods are based on very small samples, as seen in the Appendix. These small cell sizes may reduce the robustness of decomposition results and limit our ability to fully examine hypergamous patterns. In addition, this analysis does not distinguish between first and higher-order unions, nor does it account for age at union formation, divorce, or remarriage. These factors could influence spousal age gaps, particularly in contexts where widowed or divorced women enter new unions with significantly older or younger partners, or where polygynous unions are more common. Future research with richer union histories could offer deeper insights into how these dynamics shape age differences within marriages.

Given the findings, policies should be tailored to country-specific dynamics. In Ghana, where structural shifts drive declines, expanding access to secondary and higher education, particularly in rural areas, may contribute to further reductions in high spousal age gaps. However, the persistence of significant age disparities suggests that deeply rooted social norms around marriage timing and partner selection may also need to be addressed. In addition, urban migration may lead to increased exposure to age-similar peers in educational and professional settings, which may weaken traditional norms favouring large spousal age gaps (Menashe-Oren and Sánchez-Páez 2023). Urban environments also facilitate later marriages by extending schooling and delaying economic stability, both of which influence partner selection (Goujon, Lutz, and Kc 2015; Kramer 2020).

These findings highlight the role of male education in reshaping marital patterns and reducing extreme spousal age gaps. Although cases where women were more educated than their male partners were excluded in this study, trends point out that such unions are increasing over time (Esteve et al. 2016). While the findings in this study are not causal, they highlight potential pathways through which education and broader social change intersect to influence marital dynamics. Future studies with larger datasets could examine whether these partnerships influence spousal age gaps differently than traditional hypergamous unions.

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Appendix

Figure A-1 shows the cases excluded from the main analysis for both countries. These cases where women had a higher education than their male partners were necessary due to small sample sizes across survey periods, particularly in earlier survey waves. Including these cases would introduce instability in decomposition estimates, as fluctuations in small sample subgroups may disproportionately influence results. Therefore, we focus on the remaining dataset to ensure robust and interpretable findings. While the exclusion may marginally impact estimates, it does not change the broader trends observed in Kenya and Ghana.

Figure A-1: Distribution of excluded couples