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Rowing with and against the flow: fatherhood of daughters and perception about women

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Abstract

We investigate whether having a daughter in a patriarchal society gives fathers a reason to reject prevailing social norms favouring gender discrimination against women. In particular, we develop a utility (rather than behavioural) model to frame the problem and derive hypotheses that can be empirically tested using cross-sectional data from the Senegal 2023 Demographic and Health Surveys (DHS). We find that fathering daughters can positively influence men's attitudes toward gender equity. In particular, men with daughters exhibit more positive attitudes toward women compared to their peers without daughters. This finding is robust across various sub-samples, particularly regarding violence-related outcome variables.

Keywords: Men, daughters, perception about women, gender norms, utility

JEL Codes : D63, J16, Z13

1. Introduction

Gender norms play a critical role in shaping social interactions, economic outcomes, and institutional frameworks. Among these, societal perceptions of women have historically held significant power in maintaining or challenging gender inequalities. The ways in which women are viewed — whether in terms of competence, social roles, or inherent worth — affect their participation in public life, including their economic opportunities, political representation, and social mobility, which in turn affect outcomes for the entire society.

While gender equality, intended as the elimination of discrimination against women, the eradication of violence against them, and their effective participation into all levels of leadership, is nowadays high up on the list of sustainable development goals set by the United Nations as guiding objectives for policy-making, women's standing in society is not always a reflection of a country's level of economic development. For instance, kinship passes through maternal lives among the Minankabau of Indonesia, the Akans of Ghana, the Serer of Senegal, the Basques of Spain and France, and the Navajo Indians in North America. In today's China, access to local public goods follows the residence of the maternal female ancestor as of 1957.

Notwithstanding the likely stronger cultural origin of gender-bias in society vis-à-vis economic or psychological explanations, and the ample documentation of gender inequality and its consequences from several disciplines, the evolution of gender-related behaviours underpinning social norms remains under-researched. Besides the introduction of incentives and prohibitions, it is unclear what can trigger a change in gender-related beliefs and behaviour at the individual level for people living in a society with well-defined gender-bias preferences.

Existing work emphasises the existence of biases and 'taste' preferences for and against certain types that may prevent societal changes (e.g. Becker, 1957; Goldin, 1990; Eagly & Karau, 2002; Bertrand et al., 2005), which can be mostly traced back to cultural, sociological and psychological causes. Less attention is given to behavioural responses to opportunistic and 'quasi-random' events that may trigger change at the individual level and, by extension, to society. This paper aims to contribute to the literature by exploring this possible channel, specifically the responses of male parents to behavioural questions related to their perception of women in a society following a quasi-experimental event – the gender of their children – in an institutional setting that exhibits distinct preferences for male gender types.

The empirical analysis relies on data from the Senegal Demographic and Health Surveys (DHS) VIII, which captures men's attitudes toward gender-based violence and women's empowerment. Using linear probability models and various sub-samples to explore differences between men with and without daughters, the results indicate that men with daughters develop more positive attitudes toward women compared to men without daughters. Specifically, men with daughters are less likely to justify wife-beating and more likely to involve their wives in decision-making. Consistent with theoretical predictions and one previous article published in the field of political science (Sharroff et al, 2018), the findings suggest that fathering a daughter can lead to positive changes in gender-related beliefs and behaviours at the individual level. While it may not be possible to transfer the sense of purpose that fathering a daughter instigates in men to relations with other women in their lives, such as wife, sister, or female colleagues or friends, the results are suggestive that better understanding and opportunities for communication between men and women might help reduce entrenched gender biases.

The rest of the paper is organised in a literature review (Section 2), followed by the theoretical framework (Section 3). Section 4 describes the data and presents some descriptive analyses. The regression analyses are then presented in Section 5 before concluding remarks (Section 6).

2. Literature review

Multidisciplinary approaches

Several disciplines examine the consequences of social norms related to gender with the aim of uncovering their origin and, in many cases, propose government stances and interventions aimed at reducing gender inequality. Four discipline-based approaches can be broadly identified. These stem from psychology, sociology, gender studies, and economics, and cover overlapping aspects. By focusing on the cognitive processes that underpin gender perceptions, stereotypes, implicit biases, and social identity, psychology-based studies support that men develop gender schemas – for instance on leadership – which conflict with their perception of women and consequently generate biases about women's personal and professional evaluations (role congruity theory – Eagly and Karau, 2002).

Some of these biases are institutionalised in society, contributing to the formation of gender hierarchies. Sociological studies focus on the formation and existence of such norms and structures, studying the role of power dynamics, masculinity, and patriarchy in maintaining

them. This perspective is useful to explain how prevailing norms and expectations about gender roles reinforce societal beliefs about women's roles in private (e.g., family) and public (e.g., politics) spheres. Gender studies build on this approach exploring the contribution of race and class to understand the nuanced ways in which women are perceived by men and society more generally, providing insights on historical and structural factors that shape patriarchal attitudes.

An important insight from this body of research is that norms related to gender are contextual in both space and time: in other words, they vary across societies and locations, as well as historically. As such, they can and do evolve. Economics-based studies tend to explore how perceptions of gender-based roles influence women's participation in the labour market and affect their outcomes, career advancement, and wage penalties.

Overall, discipline-based studies concur in supporting that the existence of gender norms that associate women with domesticity and caregiving typically underpin a widespread assumption that women are less committed to their careers, hence less 'deserving' of occupying leadership roles (e.g. Bertrand and Hallock, 2001), in spite of more women entering the labour force (e.g. Goldin, 1990) and employers' ability to observe their actual productivity over sustained periods of time (e.g. Becker, 1957).

Behavioural studies

In recent years, behavioural economics has provided additional insights into how the perception of women in a society influences their economic outcomes through the lens of gender bias in decision-making. Unlike traditional economic models, which assume that individuals make rational decisions, behavioural models recognize that decisions are often influenced by cognitive biases and heuristics. Gender bias is one such bias that affects how men perceive women in professional and economic contexts, which can be traced back to fundamental biases like *confirmation bias*, where people tend to seek out information that confirms their pre-existing beliefs (e.g. Niederle and Vesterlund, 2007), *implicit bias*, where individuals unconsciously associate certain traits with specific genders (e.g. Bertrand, Chugh, and Mullainathan, 2005), and *status quo bias*—the preference for maintaining existing social and economic structures. For instance, stereotypes about women being less competent or less capable of handling leadership roles may unconsciously steer people towards evidence that supports it (e.g. if a woman makes a mistake in the workplace, it may be viewed as confirmation that women are less suited for the job, while overlooking similar mistakes made by men). Studies using Implicit Association Tests (IAT) have shown that people, regardless of gender,

hold unconscious biases that associate men with leadership and competence, and women with caretaking and passivity. Men in leadership roles may be resistant to change because promoting more women threatens their own status or challenges long-standing norms about male dominance in leadership.

Empirical research has shown that perceptions of women's roles are often more traditional in countries with lower levels of gender equality and weaker institutional support for women's empowerment. For example, the World Values Survey (2020) found that men in more patriarchal societies—such as parts of the Middle East, South Asia, and sub-Saharan Africa—are more likely to perceive women as primarily responsible for household duties and less capable of leadership roles. In contrast, men in more gender-equal countries, such as those in Scandinavia, are more likely to support gender equality in both the private and public spheres.

The existence of such variations reflect that where traditional gender roles are the norm, men are more likely to perceive women as less suited for leadership or public life because these perceptions align with the dominant social and cultural values (*normative social influence*), and these perceptions are reinforced by the tendency to align one's beliefs with those of the majority even when at an individual level men may personally support more progressive views of gender roles (*conformity bias*). When instead men are more likely to encounter women in leadership positions and professional roles, judgments are influenced by the information most readily available (*availability heuristic*). As perceptions are shaped by observing others, particularly authority figures and peers (*social learning theory*), if gender inequality is entrenched, women are less likely to occupy non-traditional roles, perpetuating the belief that they are naturally suited for caregiving and domestic responsibilities. Furthermore, if gender equality is framed as a threat to traditional values or male dominance, gender-biased perceptions are more resistant to change (*framing effects*) as this directly threaten men's established dominant roles (*loss aversion*).

African literature

In many African societies, norms around gender are deeply entrenched and affect virtually every aspect of women's lives, from economic participation to education, health, and political engagement. A foundational aspect of social norms theory is that individuals conform to norms because they believe that others expect them to do so, and they value the social approval that comes with adherence (e.g. Bicchieri, 2006). For example, in many African communities, women are expected to focus on domestic responsibilities, including child-rearing and

household management, while men are expected to be the primary breadwinners. Women who challenge these traditional roles—by pursuing education or employment outside the home—may face resistance or even sanctions from family and community members, as their behaviour deviates from the socially accepted norm (e.g. Haylock et al, 2016).

This collective enforcement mechanism, often referred to as "social sanctions," is key to the stability of norms. Individuals who deviate from the norm not only risk losing social approval but may also face material penalties, such as reduced access to resources or support networks. In African contexts, where community ties and familial relationships are often crucial for survival and insurance mechanisms, particularly in rural areas, the cost of non-compliance with social norms can be high. As a result, women may be deterred from pursuing opportunities that could improve their economic status or personal autonomy due to the fear of social repercussions (e.g. Wipper, 1972; Laurenzi et al, 2024).

In addition to social enforcement, social norms are transmitted across generations, leading to their persistence over time. Norms related to women's roles in African societies are often passed down through family structures, reinforced by cultural traditions, religious beliefs, and even state policies (e.g., Boyle and Svec, 2019; Mbachu et al, 2025). This intergenerational transmission ensures that even as external factors, such as economic globalisation or technological advances, exert pressure for change, traditional norms around gender roles may remain resilient. For example, even in regions where economic growth has opened up new opportunities for women in formal labour markets, norms that prioritise women's domestic roles over professional careers continue to limit women's participation in these sectors (e.g. Hallward-Driemeier, 2013; Marcus, 2021).

Notwithstanding Elster's (1989) and Akerlof and Kranton's (2000) insight that individuals derive a sense of self from their adherence to social norms, African women's identity is often closely tied to fulfilling traditional roles as caregivers and homemakers (Fekadu and Kraft, 2002; Posel and Bruce-Brand, 2021; Ndayiragije, 2024). This internalization of social norms further explains why many women may not challenge restrictive norms, even when doing so could lead to economic or social benefits. The identity component reinforces the stability of norms, as deviations not only lead to social sanctions but also a sense of personal conflict or loss of identity (Van Vlaenderen and Cakwe, 2003; Bryceson, 2010).

The labour market is a critical arena where social norms about women's roles manifest in various African countries. Significant barriers due to entrenched societal expectations that confine women primarily to unpaid domestic labour or informal economic sectors significantly

reduces women's (formal) labour market participation (e.g. Charmes and Wieringa, 2003; Blackden and Wodon, 2006) and access to education (Evans and Miguel, 2007; UNESCO, 2015). Women are also constrained in undertaking entrepreneurial activities (e.g. Duflo, 2012; Gaddis and Klasen, 2014).

Education and awareness campaigns are powerful tools for changing social norms by providing information, reshaping attitudes, and influencing behaviour, and indeed well-targeted education campaigns can play a key role in challenging gender stereotypes and promoting women's rights in African societies (e.g. Glennerster and Takavarasha, 2013; Evans, 2014; Dele-Ajayi et al, 2020). Economic empowerment programs such as microcredit and financial independence programs have also proven to successfully shifting gender norms in African societies (e.g. Blattman et al., 2013; Fafchamps et al., 2014; Norwood, 2014). Mixed effects instead have been recorded for legal reforms that promote gender equality (e.g. Kabeer, 2005; Hallward-Driemeier and Hasan, 2013).

Despite the growing body of research on social norms, especially from a behavioural economics viewpoint, several gaps remain in the literature, particularly in the context of individual gender-specific behaviours in Africa. While the literature tries to address the gaps to develop effective interventions that promote gender equality, little is known about built-in mechanisms that predispose a gender-biased society to change. We focus on one such possible mechanism, relying on its quasi-experimental nature to offer a causal interpretation: namely, the birth of a daughter. In addition, we use information from a large national survey to test our key question: whether or not fathers of a female offspring have more balanced gender views about women in society. We interpret an affirmative answer as evidence that more effective communication between individuals more and less exposed to women – for instance through exposure and interactions via schooling in mixed classes and events – can reduce entrenched gender-biased views.

3. Theoretical framework

There is an inherent challenge in modelling behaviours and preferences, as behaviours tend to be modelled as states and preferences as utility. In this model, we use the established utility function, hence we use preferences, but introduce behaviours in form of ‘adversity loss’ - hence with pecuniary implications on utility. The potential loss to utility arises from deviating from a societal ‘average behaviour’. For instance, given a society’s stance on, say, gender equality,

an individual's deviation is modelled as a cost (zero being the minimum) because deviating from society's average stance can reduce utility – e.g. by jeopardizing access to jobs or credit or other opportunities/incentives, such as the ones offered by social networks, that underpin one's utility. There is of course also a social cost, which in turn can be associated with monetary costs (e.g., reputation). In particular, the deviation is measured in absolute value, and it is one of the two components of the disutility of being a 'deviant':

$$y_i = -(|q_i - \bar{q}| + u_i) \quad (1)$$

\bar{q} = average stance of society on a given topic

q_i = individual stance on same topic

u_i = shock

3.1. The model

We take the case of an individual i , whose utility is described by:

$$U(i) = f(y, X_i)$$

where f is a function with $f' > 0$ and $f'' < 0$, y is the disutility of deviating from societal average behaviour, and X is a set of individual i 's observed characteristics that shape such perception like education, gender, age, marital status.... to name a few.

By definition, the deviating disutility parameter y is the sum of two components:

$$y = -(d_i + u_i)$$

where $d_i = |q_i - \bar{q}| > 0$ and u_i that is normally distributed with mean zero. A non-deviating individual has no disutility from observing y when there is no shock. A deviating individual, for whom $d_i > 0$, faces costs and a reduced utility.

Take for instance, gender equality with a societal average value of \bar{q} . A deviating individual on gender equality will find it costly to express his/her views and may experience difficulties in finding jobs, housing, access credit.... s/he will therefore have a diminished utility as a result of having $y < 0$.

The average wellbeing of an individual is estimated as a conditional expectation $E(U(.)|y, X)$. In a patriarchal society, the birth of a daughter can be represented by a shock to the disutility

y. In particular as $u_i > 0$ the birth of a daughter increases the disutility associated with deviating from societal behaviour as the parent has to face additional challenges and cost in raising the daughter in a potentially hostile environment. What consequences will the birth of a daughter have on parental wellbeing, in other words what is $\frac{\partial U(.)}{\partial u}$?

The answer is $\frac{\partial U(.)}{\partial y} \frac{\partial y}{\partial u} < 0$. So, the birth increases the deviation of the individual from the society but as deviating is costly the wellbeing of the individual is negatively affected.

If utility directly influences beliefs in prevailing social norms, then it is possible to link an individual's stance on gender bias to the gender of his/her offspring with a functional form like:

$$\Pr (B_i) = g(U(i))$$

– where $\Pr (B_i)$ captures an individual's support for gender bias – and traces the effect of the birth of a daughter on gender-biased beliefs through:

$$\Pr (B_i|u_i) = g'(\frac{\partial U(.)}{\partial y} \frac{\partial y}{\partial u}) < 0$$

In other words, an individual will be less likely to express preferences in support of (societal) gender biased stances with the same probability after the birth of a daughter.

3.2. Some predictions

1. In patriarchal societies, having a daughter make people more deviant from society's average (e.g. increased support for gender equality in a society where the common stance is exactly the opposite)
2. In patriarchal societies, having a son make people less deviant – hence positive or nil effect
3. In equalitarian societies there is no child gender effect on parents' wellbeing or views
4. The 'daughter effect' could be attenuated by higher education, income and wealth; but reinforced in some sub-groups e.g. not so well integrated immigrants.

3.3. Estimation

This model can be easily incorporated into a random utility model framework, whereby the dependent variable is preference for certain behaviours (e.g., is it correct to prevent wives from

socializing?) leading to $Y = (\text{No} = 0, \text{Yes} = 1)$ replies. By fitting a linear model to the reply, augmented with a random error term, one obtains:

$$E(Y_i) = b_0 + b_1 X_i = \widehat{\Pr}(Y_i = 1) = b_0 + b_1 \bar{X}_i + b_2 \bar{d}_i \quad (2)$$

which can be estimated by Ordinary Least Squares (OLS).

4. Data and descriptive analysis

4.1. Different approaches to measuring perception about women

Perceptions about women and gender roles are multifaceted, encompassing various dimensions such as societal views on women's roles, how they should be treated, the rights they deserve, and the duties expected of them. These perceptions influence attitudes toward women in several areas, including harassment and violence, restrictions on social interactions, participation in certain types of economic activities, and their roles within households.

Empirical analyses of gender norms based on data other than lab experiments often rely on different approaches to measure perceptions about women and gender roles. One approach involves deducing perceptions about women from social norms embedded in laws or societal rules that restrict women's opportunities. For example, in societies where school enrollment is primarily granted to sons, this may reflect a perception that women are best suited for domestic roles like family care. In this respect, OECD (2010) highlighted that, in 2009, about one-third of 122 sampled non-OECD countries had laws restricting women's freedom of mobility or dress in public spaces. Another approach identifies perceptions about women by examining facts characterizing gender roles. For instance, Alesina et al. (2013) analyzed women's participation rates in occupation or activities outside the home such as market employment, entrepreneurship, or participation in politics as indicators of societal views on gender roles.

A more direct method involves analyzing responses to questionnaires that reveal people's attitudes toward women and gender roles. Studies that relied on such direct questionnaires include Becker (2019) who used data from the Demographic and Health Surveys (DHS) to examine attitudes toward women's decision-making power and freedom of mobility in relation to female virginity and sexual behavior. Similarly, Alesina et al. (2013) resorted to surveys that report attitudes toward gender roles to analyze the historical origins of present-day views about gender roles. They examined the male and female attitudes about the appropriate role of women in society based on questions from the World Value Survey (WVS) revealing respondents'

view of statement such as “when jobs are scarce, men should have more right to a job than women.” Our analysis relies on the third approach, using information from the Demographic and Health Surveys (DHS) to explore men’s perceptions about women in Senegal.

4.2. Brief presentation of the Demographic and Health Surveys

The survey data from the Demographic and Health Surveys (DHS) explore the attitudes about the perceptions of women among men in various countries – to date, more than 400 surveys have been conducted across over 90 countries. The DHS are large-scale, nationally representative surveys that collect data on population, health, and nutrition, primarily in developing countries. Established by the United States Agency for International Development (USAID), the DHS program is widely regarded as the gold standard for health and demographic data collection, offering high-quality, comparable datasets that are extensively used by development practitioners and scholars.

Among the four main questionnaires of the DHS carried out in Senegal, we focus on data from the Man’s Questionnaire and the Couple’s Questionnaire. The Man’s Questionnaire collects information on topics such as gender roles and background characteristics. The respondents are men of reproductive age, typically between 15 and 49, 54, or 59 years. In the Couple’s Questionnaire, the unit of analysis is the couple. The questionnaire focuses on married or cohabiting couples, where both partners have declared their relationship status and completed individual interviews. The two questionnaires provide ideal measures to assess men’s perceptions of women. We focus on two key categories of measurement: attitudes toward domestic violence against women and women’s empowerment, particularly through their decision-making power within the couple.

(i) The domestic violence measures

The first category captures perceptions of gender-based violence and is derived from the Man’s Questionnaire. This questionnaire includes questions about whether a man finds domestic violence acceptable under specific circumstances, such as (i) if a woman goes out without telling her husband; (ii) if she argues with her husband; (iii) if she refuses to have sex with her husband; (iv) if she burns the food, (v) if she neglects the children. These questions result in five distinct, yet complementary variables related to gender-based violence. Consistent with Becker (2019), we use these variables as measures of men’s perceptions of women. Each variable is coded as 1 if a man finds beating justified in the given scenario and 0 otherwise.

(ii) *The woman empowerment variables*

The second category focuses on women's empowerment and reflects their decision-making power within the household in three areas, based on data from the Couple's Questionnaire: (i) decisions about her own health care, (ii) decisions regarding large household purchases, and (iii) decisions about visits to family or relatives. In each case, the variable is coded as 1 if the decision is made solely by the woman or jointly with her partner, and 0 if the decision is made solely by the man. These variables also align with Becker's (2019) approach to measuring perceptions of women.

(iii) *Distinguishing men with daughters from men without daughters*

The Man's Questionnaire and Couple's Questionnaire include questions about the number of daughters a respondent has at home (variable mv203), elsewhere (variable mv205), and deceased (variable mv207). Deceased daughters are included to account for the potential lasting impact of having had a female child on men's attitudes, even if the daughter is no longer alive. Using this information, we construct a dummy variable to distinguish men with daughters (coded as 1) from men without daughters (coded as 0). In our analysis, we test alternative sub-samples to ensure the robustness of the findings. In the baseline, the group of interest consists of men with at least one living or deceased daughter, including men with both daughters and sons. The comparison group comprises men with sons only or no children.

4.3. Some descriptive analyses

The Senegal DHS VIII was conducted in 2023 and is the most recent survey available for the country at the time of analysis. The Man's dataset includes data from over 6,000 respondents across the country, with almost half (48.8%) residing in urban areas. Among the respondents, 34.4% have at least one living or deceased daughter, while the remaining 65.6% either have only sons or no children. The Couple's dataset, on the other hand, contains data from 2,403 men and women who both declared that they are married or living together and completed individual interviews. This explains the significantly smaller sample size compared to the Man's dataset. Among these men, 80.4% have at least one living or deceased daughter, while only 19.6% have only sons or no children. Compared to the Man's dataset, the composition of men in the Couple's dataset is heavily skewed toward those with daughters. This is expected, as the comparison group comprises men with only sons or no children, and the likelihood of finding childless individuals is lower among married men. This trend is particularly relevant in

a society like Senegal, where conservative values – such as the emphasis on virginity before marriage – remain dominant.

Table 1 compares men with daughters and men without daughters across variables related to perceptions of women. The first notable observation is that, regardless of the sample considered, the proportion of men who view domestic violence as justified is substantially lower than those who do not. This suggests that the vast majority of adult men in contemporary Senegalese society are against violence against women, regardless of the justification, according to DHS data. For instance, only 3% of men in the sample view beating a woman as justified if she burns food, and this figure is less than 5% among men without daughters.

For variables related to women's empowerment, the trends are more mixed. Among men with daughters and those without, there is a lower proportion of respondents who allow their partners to make decisions – either solely or jointly – about their own health care or large household purchases. However, the proportion increases for decisions about visits to family: 52.9% among men without daughters and 60.6% among men with daughters. Still, these figures are not substantially higher than the proportion of men who believe such decisions should be made solely by themselves. This may indicate that many men in Senegal consider themselves the primary authority in marital relationships, reflecting the traditional role of the "head of the household," typically held by men in such societies.

When comparing perceptions of gender-based violence between the two groups of men, a significant difference is observed between men with daughters and those without, across all measures except for violence justified by a wife leaving the house without informing her husband. For all other scenarios, the proportion of men with daughters who find violence against women acceptable is consistently lower. This difference ranges from 1.3% (violence justified for refusing sex) to 2.2% (violence justified for child neglect). For the women's empowerment variables, a statistically significant difference is found only for decisions about visits to family, where the proportion of men with daughters who allow their partners decision-making power is lower than that of men without daughters. These observed differences are further examined in the econometric estimations presented in the next section.

5. Regression analyses

5.1. The model

The empirical analysis of the link between fatherhood and perception about women is based on the following linear probability model:

$$Attitude_i = \beta_0 + \beta_1 Daughter_i + \beta_2 Educ_i + \beta_3 Wealth_i + \beta_5 Poly_i + \beta_6 Urban_i + \varepsilon_i \quad (3)$$

Where $Attitude_i$ is the outcome variable, representing two categories of variables used as proxies for men's attitudes toward women as described in the previous section. $Daughter_i$ is the key explanatory variable of interest, a binary variable coded as 1 if a man has a living/deceased daughter – including men with both daughters and sons – and 0 if he has sons only or no children. In sensitivity analyses and robustness tests, alternative sub-samples are also considered to get deeper insights into the relationship between having a daughter and perception about women. The parameter on $Daughter_i$ allows exploring whether being a daughter's father is associated with more positive perceptions of women, thus investigating differences between men who have a daughter and those without in their attitudes toward women.

$Educ_i$, $Wealth_i$, $Poly_i$, and $Urban_i$ are control variables corresponding to the man's education level, wealth index, a dummy variable indicating if he is in polygynous union, and a binary variable indicating if the place of residence is an urban area, respectively. β_0 is the constant term and ε_i is the independently and identically distributed (*i.i.d.*) error term.

While we present the estimation results as describing correlations rather than causal effects, it is worth noting that the variable of interest is likely to be exogenous. We agree that the decision to have a child is endogenous to the household, though the sex of the child is principally determined by nature and therefore exogenous in most cases. In a society like Senegal, where abortion is not allowed and illegal cases are lower than in other low-income economies (e.g. Schiel, 2012; Sedgh et al, 2015), the sex of a child is not typically influenced by the respondent's decisions. Thus, there are valid reasons to believe that the results may actually reflect causal effects even though we describe them hitherto as correlations to maintain a cautious and balanced interpretation.

5.2. Estimation results

5.2.1. Main results: Men with daughters only and men with both daughters and sons vs. men with sons only and men without any child

Equation (3) above is estimated using OLS¹, applying the survey design with the cluster number as primary sampling unit, and the survey's identified strata. The estimation results are provided by Table 2. Columns (1) – (5) show the results using the violence variables as outcome variables, while columns (6) – (8) refer to perception about women through the decision-making variables. The findings strongly indicate that men with daughters have more positive attitudes toward women, in both the violence and empowerment dimensions. Regarding the violence variables, as shown by the negative coefficients on the *Daughter* dummy, men who have daughters among their children have a lower probability of beating their wives, compared to men with only sons or no children. The relation is strongly significant – at 1% – for all motives considered, except “going out without telling the husband”. This exception could suggest that such behavior may be considered a moderate “offense” compared to arguing, refusing sex, burning food, or neglecting children. The probabilities of significant differences range from 2.3% (refusing sex) to 3.2% (child neglect).

The empowerment variables also support a more positive attitude toward women among men with daughters. The coefficient on *Daughter* is positive and significant – at conventional levels – for decisions regarding women's healthcare and large household purchases. Therefore, compared to other men, those with daughters are more likely to involve their wives in these decisions. However, no significant difference between the two groups is found for decisions on visits to family or relatives, which may be less critical in Senegal's context, where social interactions are relatively easy.

These findings suggest that fathering daughters can influence men's attitudes toward gender equity. Several factors may explain this relationship. Fathers of daughters may develop a stronger sense of empathy toward women, viewing their daughters as a reflection of their wives, mother, or sisters. This could lead to greater respect and understanding of the challenges faced by women, reducing the likelihood of violent behavior and giving them more consideration in decision making. Raising a daughter may encourage fathers to become more sensitive to gender equity issues, in line with the evidence and conclusions discussed by

¹ The linear probability model (LPM) is preferred over a Probit/Logit model for its ease of interpretation, and for not being subject to convergence failures, among other reasons. In addition, the LPM often fits nearly as well as the logistic model: over certain ranges, the probability is approximately linearly related to the log-odds function used in logistic regression. In recent research, the LPM tends to be used instead of Probit/Logit models. See for example von Hippel and Workman (2016).

Sharrow et al (2018) on the 'first daughter' influence exerted on fathers' stance on gender equity policies. Such sensibility likely includes treating women with respect. If so, having a daughter could lead men to change their behavior in how they interact with their spouses. For instance, fathers may consciously avoid behaviors like wife-beating to set a good example for their daughters.

The control variables generally have the expected signs when statistically significant. Education is significant only in relation to the violence variables, with a negative sign – indicating that higher levels of education are associated with greater rejection of violence against women. Wealthier fathers tend to develop more positive attitudes towards women, as evidenced by the significant negative coefficients on *Wealth* in relation to the violence variables and positive coefficients for the decision-making variables. Polygyny and place of residence are mostly significant in relation to the decision variables. Fathers in less traditional settings – those in non-polygamous unions and living in urban areas – are more likely to involve women in decision-making compared to their counterparts.

The baseline case was tested for possible omitted variable bias based on Oster (2019) and Diegert et al. (2022). As displayed in Table A4 in the Appendix, both tests strongly suggest that the baseline results are robust to omitted variables bias.

5.2.2. Sensitivity tests: Alternative sub-samples

In the previous regressions, we compared men with daughters only or both daughters and sons to men with sons only or no children. In what follows, we consider alternative samples to test the sensitivity of the main results to the composition of the group under consideration and the reference group.

A1: Men with daughters only vs. men with sons only and men without children

The decision to group men with daughters only and those with both daughters and sons was motivated by the idea that having a daughter shapes positive attitudes toward women, regardless of whether sons are also present and that this attitude cannot be altered (at least significantly) by the presence of sons in addition to daughters. To test this, we consider a sample of men having daughters only – excluding fathers with both daughters and sons – which we compare with the same previous reference group, i.e., men with sons only and men without any child. The estimation results are reported in Table 3 and align with the previous main results regarding perceptions of violence against women. Men with daughters are found to

have a lower probability of justifying beating women for the same reasons as in the previous case, except for the “refusing to have sex” reason where the relation turns non-significant. The main difference with the previous results arises for perceptions captured through the empowerment variables where no significant difference is found between the two groups of men across all decision dimensions considered.

A2: Men with daughters only and men with both daughters and sons vs. men without children

In Table 4, we revisit our previous group of interest (men with daughters only and those with both daughters and sons) but this time, we compare them with men without children. The results regarding the violence outcome variables confirm the previous finding and are even more compelling. The association between having daughters and rejecting wife-beating in the scenario where a woman goes out without telling her husband becomes significant at the 10% level, while the relationships for other violence variables remain highly significant with slightly larger magnitudes. For the empowerment variables, women married to men with daughters are more likely to participate in decision-making, particularly for decision on large household purchases where the coefficient is significant at the 5% level.

A3: Men with daughters only vs. men without children

As in case A1, we focus on men with daughters only as the group of interest. However, the comparison group in this case consists of men without any children, as in the previous analysis. The significant relationships, highlighted in Table 5, pertain to justifications for violence against women in scenarios involving arguments, food burning, and child neglect. For other dimensions of men’s attitudes toward women, no significant differences are observed between the two groups.

A4: Men with daughters and sons vs. men with sons only

The results from this case are provided by Table 6. The findings on the violence dimensions align closely with previous results, confirming that having a daughter is associated with a lower likelihood of justifying wife-beating. Only for the empowerment aspects of men’s perceptions, the effect of having daughters is found to be non-significant.

Summary

The regression analysis results consistently show that men with daughters exhibit more positive attitudes toward women compared to their peers without daughters. This finding is robust across various sub-samples, particularly regarding violence-related outcome variables, where the differences are statistically significant for most scenarios. For women's empowerment variables, men with daughters generally have attitudes that are either equal to or more favorable than those of their counterparts without daughters. Depending on the sub-sample, the relationship is either positive and significant or non-significant. No evidence suggests a negative attitude among men with daughters, regardless of the decision variable considered.

5.2.3. Is the “daughter” effect driven by cultural-specific effects?

Accounting for societal consideration of women

Contrary to some popular beliefs, women hold significant roles in many African societies, including positions of political and cultural influence. For instance, women often play vital roles in traditional governance structures as queens, priestesses, or custodians of cultural practices. Among certain ethnic groups, such as the Wolof and Serer, women historically served as advisors to kings and chiefs, directly influencing decision-making processes. These cultural norms may shape men's perceptions of women regardless of whether they have daughters. To explore whether the observed differences between men with and without daughters are driven by socio-cultural norms, we conducted a set of regressions controlling for ethnicity. A new categorical variable, labeled *ethnicity*, is introduced to classify respondents into six groups: Wolof (the reference group), Poular, Serer, Mandingue, Diola, and all other groups (including foreign ethnicities). The results, presented in Table 7, clearly indicate that ethnicity does not influence the primary findings. The coefficients on the *Daughter* variable remain nearly identical to the main results in terms of sign, magnitude, and statistical significance. This suggests that the observed “daughter effect” on men's attitudes toward women is not necessarily driven by cultural-specific norms but is instead robust across ethnic groups.

5.2.4. Focusing on living daughters

Instead of considering men with both living and deceased daughters as done so far, in the present analysis we rather focus on men with only living daughters and replicate the

estimations. The results, presented in Table 8, are consistent with the previous findings. This suggests that past interactions with daughters, whether they are living or deceased, may have a lasting positive impact on men's attitudes toward women.

5.2.5. Accounting for the small proportion of ones for violence variables using the Rare Events Logistic Regression

Unlike the empowerment variables for which the distribution of the proportion of 1s and 0s is not skewed toward a particular value, the domestic violence variables have a significantly lower proportion of 1s compared to 0s. For example, more than 95% of men in the sample believe that burning food is not a valid reason for beating a woman. This imbalance can make the domestic violence variables subject to issues related to rare events data such substantial underestimation of the event probabilities when using conventional estimation procedures (see for example Tomz et al., 2003).

To test the robustness of the findings to rare events-related bias, Table 9 replicates the baseline estimations using the Rare Events Logistic Regression² method proposed by Tomz et al., 2003), focusing on the gender-based violence variables for the reasons discussed above. The estimation results reinforce the earlier findings: men with daughters exhibit more positive attitudes toward women, as indicated by the negative coefficients on the key explanatory variable. Moreover, these coefficients are highly significant, including the one associated with the 'beating' variable, which was not significant under the OLS estimations.

6. Conclusion

While it is well established that eliminating discrimination against women and promoting gender equality yield significant socio-economic benefits, negative attitudes toward women persist, including in the developing world. Many beliefs about gender roles are deeply rooted in cultural norms and historical traditions, making them difficult to change through policy interventions. However, we show that opportunistic and 'quasi-random' events, such as the birth of a daughter, can trigger shifts in individual attitudes, potentially influencing broader societal biases and men's gender-related preferences.

² We would like to thank an anonymous reviewer for the suggestion.

We develop a theoretical framework that models preferences using a utility function, incorporating behaviors in the form of 'adversity loss,' which has pecuniary implications for utility. Among other predictions, the model suggests that having a daughter leads individuals in a gender-biased society to take the courage to deviate from prevailing societal norms—for example, increasing support for gender equality in societies where the prevailing stance is the opposite. Using data from the Senegal DHS, we find strong empirical support for these theoretical predictions. Specifically, male parents of female offspring exhibit more balanced gender views. Men with daughters are less likely to justify wife-beating and more likely to involve their wives in decision-making. These results remain robust across different sample compositions (reference and comparison groups) and alternative model specifications that account for cultural considerations. The results also align with those discussed in the field of political science by Sharrow et al (2018), who find a strong first-daughter effect on fathers' stance on gender equality policies.

From a practical perspective, several factors may explain the relationship between fatherhood and perceptions of women. Fathers of daughters may develop a stronger sense of empathy toward women, seeing their daughters as reflections of their wives, mother, or sisters. This may in turn foster greater respect and understanding of the challenges women face, reducing the likelihood of violent behaviour and increasing their consideration in decision-making. Raising a daughter may also heighten fathers' awareness of gender equity issues, reinforcing the importance of treating women with respect, thereby reducing gender-bias in the interactions with their spouses. Although only a suggestion, fathers may consciously refrain from behaviours such as wife-beating to set a positive example for their daughters.

From a policy standpoint, these findings suggest capitalising on the daughter effect to share the behaviour of fathers (of daughters) to reduce deeply ingrained gender biases and promote more positive attitudes toward women at the societal level.

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Tables

Table 1. Comparison of men with daughters and men without

	Have daughter	Without daughter	Difference
Beating justified for			
Going out	5.2	5.7	– 0.5
Argument	4.4	6.3	– 1.9***
Refusing sex	4.8	6.1	– 1.3*
Burning food	3.0	4.9	– 1.9***
Child neglect	3.9	6.1	– 2.2***
Decision on			
Health	36.3	32.8	3.5
Purchases	39.4	38.3	1.1
Visits	52.9	60.6	– 7.7**

Note: the values for men with daughters and men without daughters are in percent. The differences are in percentage points. *** p<0.01, ** p<0.05, * p<0.1

Table 2. Baseline estimation results: Men with daughters only and men with both daughters and sons vs. men with sons only and men without any child

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Gender violence attitude					Decision on		
	Go out	Argument	Refuse sex	Burning food	Neglect child	Health	Purchases	Visits
Daughter	-0.014 (0.009)	-0.027*** (0.007)	-0.023*** (0.009)	-0.026*** (0.006)	-0.032*** (0.007)	0.070** (0.033)	0.055* (0.032)	-0.020 (0.028)
Education	-0.006* (0.003)	-0.006* (0.003)	-0.008 (0.005)	-0.009*** (0.003)	-0.003 (0.003)	0.001 (0.016)	0.002 (0.018)	-0.002 (0.013)
Wealth	-0.011*** (0.004)	-0.016*** (0.004)	-0.018*** (0.004)	-0.009** (0.004)	-0.015*** (0.003)	0.050*** (0.015)	0.032** (0.014)	0.061*** (0.016)
Polygyny	0.006 (0.015)	-0.002 (0.013)	-0.000 (0.013)	0.000 (0.011)	0.013 (0.013)	-0.005 (0.028)	-0.062** (0.031)	-0.057* (0.032)
Urban	-0.002 (0.011)	0.005 (0.008)	0.018* (0.011)	0.012 (0.009)	0.003 (0.010)	0.071* (0.038)	0.108*** (0.039)	0.112** (0.049)
Constant	0.102*** (0.011)	0.121*** (0.012)	0.120*** (0.013)	0.084*** (0.012)	0.113*** (0.011)	0.129*** (0.038)	0.224*** (0.040)	0.358*** (0.038)
Observations	6,169	6,165	6,142	6,169	6,176	2,403	2,403	2,403
R-squared	0.007	0.011	0.011	0.008	0.011	0.044	0.043	0.079

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3. Men with daughters only vs. men with sons only and men without children

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Gender violence attitude					Decision on		
	Go out	Argument	Refuse sex	Burning food	Neglect child	Health	Purchases	Visits
Daughter	0.003 (0.019)	-0.028*** (0.011)	-0.015 (0.014)	-0.033*** (0.010)	-0.025* (0.014)	0.005 (0.058)	0.044 (0.058)	-0.060 (0.045)
Education	-0.004 (0.004)	-0.006 (0.004)	-0.007 (0.006)	-0.009** (0.004)	-0.003 (0.004)	0.055** (0.027)	0.036 (0.027)	0.046** (0.021)
Wealth	-0.009* (0.005)	-0.017*** (0.004)	-0.019*** (0.005)	-0.009** (0.004)	-0.016*** (0.004)	0.053** (0.021)	0.036 (0.023)	0.087*** (0.021)
Polygyny	-0.048** (0.023)	-0.035 (0.027)	-0.039 (0.026)	-0.017 (0.025)	-0.010 (0.030)	-0.006 (0.105)	-0.090 (0.103)	-0.020 (0.099)
Urban	-0.015 (0.013)	0.002 (0.010)	0.014 (0.013)	0.010 (0.010)	-0.004 (0.011)	0.003 (0.058)	0.122* (0.069)	0.062 (0.066)
Constant	0.101*** (0.014)	0.125*** (0.014)	0.124*** (0.015)	0.086*** (0.014)	0.119*** (0.013)	0.106* (0.055)	0.175*** (0.058)	0.252*** (0.051)
Observations	4,232	4,234	4,215	4,240	4,243	652	652	652
R-squared	0.007	0.012	0.011	0.007	0.011	0.060	0.072	0.128

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4. Men with daughters only and men with both daughters and sons vs. men without children

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Gender violence attitude					Decision on		
	Go out	Argument	Refuse sex	Burning food	Neglect child	Health	Purchases	Visits
Daughter	-0.015*	-0.031***	-0.026***	-0.027***	-0.035***	0.072	0.111**	0.016
	(0.009)	(0.008)	(0.009)	(0.007)	(0.008)	(0.049)	(0.052)	(0.043)
Education	-0.007*	-0.007**	-0.010*	-0.010***	-0.003	-0.010	-0.008	-0.012
	(0.004)	(0.003)	(0.005)	(0.003)	(0.003)	(0.018)	(0.018)	(0.015)
Wealth	-0.012***	-0.018***	-0.020***	-0.011***	-0.017***	0.054***	0.031**	0.059***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.015)	(0.014)	(0.018)
Polygyny	0.008	-0.002	-0.000	-0.001	0.015	-0.004	-0.060**	-0.057*
	(0.015)	(0.013)	(0.013)	(0.011)	(0.014)	(0.029)	(0.030)	(0.032)
Urban	-0.004	0.010	0.023**	0.013	0.007	0.077**	0.125***	0.121**
	(0.011)	(0.008)	(0.011)	(0.009)	(0.010)	(0.039)	(0.039)	(0.052)
Constant	0.107***	0.128***	0.128***	0.089***	0.117***	0.121**	0.169***	0.330***
	(0.012)	(0.012)	(0.013)	(0.012)	(0.011)	(0.051)	(0.056)	(0.047)
Observations	5,735	5,732	5,706	5,736	5,741	2,122	2,122	2,122
R-squared	0.008	0.013	0.014	0.009	0.013	0.047	0.047	0.072

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5. Men with daughters only vs. men without children

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Gender violence attitude					Decision on		
	Go out	Argument	Refuse sex	Burning food	Neglect child	Health	Purchases	Visits
Daughter	0.003 (0.019)	-0.030*** (0.011)	-0.016 (0.014)	-0.032*** (0.009)	-0.028** (0.014)	0.007 (0.070)	0.093 (0.070)	-0.034 (0.053)
Education	-0.005 (0.004)	-0.007* (0.004)	-0.009 (0.007)	-0.011*** (0.004)	-0.003 (0.004)	0.048 (0.039)	0.018 (0.037)	0.044 (0.032)
Wealth	-0.010** (0.005)	-0.020*** (0.005)	-0.022*** (0.005)	-0.011*** (0.004)	-0.018*** (0.004)	0.069*** (0.026)	0.035 (0.030)	0.093*** (0.031)
Polygyny	-0.031 (0.037)	-0.048*** (0.015)	-0.058*** (0.015)	-0.032*** (0.011)	0.016 (0.044)	0.016 (0.140)	-0.100 (0.127)	0.044 (0.120)
Urban	-0.018 (0.013)	0.009 (0.011)	0.021 (0.013)	0.012 (0.010)	0.001 (0.012)	-0.015 (0.082)	0.217** (0.088)	0.075 (0.091)
Constant	0.108*** (0.014)	0.135*** (0.014)	0.135*** (0.015)	0.094*** (0.013)	0.126*** (0.014)	0.067 (0.062)	0.094 (0.065)	0.198*** (0.066)
Observations	3,798	3,801	3,779	3,807	3,808	371	371	371
R-squared	0.009	0.014	0.015	0.010	0.012	0.077	0.123	0.142

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 6. Men with daughters and sons vs. men with sons only

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Gender violence attitude					Decision on		
	Go out	Argument	Refuse sex	Burning food	Neglect child	Health	Purchases	Visits
Daughter	-0.018*	-0.027***	-0.026***	-0.025***	-0.034***	0.080	0.050	-0.017
	(0.009)	(0.008)	(0.009)	(0.007)	(0.007)	(0.000)	(0.000)	(0.000)
Education	-0.006*	-0.006	-0.009*	-0.009**	-0.003	-0.000	-0.004	-0.010
	(0.004)	(0.003)	(0.005)	(0.003)	(0.003)	(0.000)	(0.000)	(0.000)
Wealth	-0.011***	-0.016***	-0.018***	-0.010**	-0.016***	0.049	0.033	0.054
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.000)	(0.000)	(0.000)
Polygyny	0.010	-0.001	0.003	-0.000	0.014	-0.011	-0.059	-0.065
	(0.015)	(0.014)	(0.013)	(0.012)	(0.014)	(0.000)	(0.000)	(0.000)
Urban	-0.004	0.004	0.019*	0.015	0.004	0.079	0.092	0.136
	(0.011)	(0.008)	(0.011)	(0.009)	(0.010)	(0.000)	(0.000)	(0.000)
Constant	0.104***	0.120***	0.122***	0.085***	0.115***	0.130	0.236	0.375
	(0.012)	(0.012)	(0.013)	(0.013)	(0.011)	(0.000)	(0.000)	(0.000)
Observations	5,821	5,818	5,793	5,823	5,827	2,181	2,181	2,181
R-squared	0.008	0.010	0.011	0.007	0.011	0.045	0.035	0.078

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7. Accounting for societal consideration of women

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Gender violence attitude					Decision on		
	Go out	Argument	Refuse sex	Burning food	Neglect child	Health	Purchases	Visits
Daughter	-0.013 (0.009)	-0.027*** (0.008)	-0.023** (0.009)	-0.027*** (0.006)	-0.033*** (0.007)	0.069** (0.032)	0.063** (0.032)	-0.008 (0.027)
Education	-0.005 (0.004)	-0.005 (0.003)	-0.009* (0.005)	-0.009*** (0.003)	-0.003 (0.003)	-0.002 (0.017)	0.004 (0.016)	0.005 (0.012)
Wealth	-0.010** (0.004)	-0.015*** (0.004)	-0.015*** (0.004)	-0.007* (0.003)	-0.012*** (0.004)	0.055*** (0.015)	0.031** (0.014)	0.051*** (0.015)
Polygyny	0.006 (0.015)	-0.002 (0.013)	0.001 (0.013)	0.001 (0.011)	0.014 (0.013)	-0.001 (0.028)	-0.066** (0.031)	-0.068** (0.032)
Urban	-0.003 (0.010)	0.004 (0.008)	0.016 (0.011)	0.011 (0.009)	0.002 (0.010)	0.063 (0.039)	0.096** (0.039)	0.112** (0.047)
Poular	0.017 (0.011)	0.010 (0.009)	0.023** (0.009)	0.024*** (0.009)	0.028*** (0.010)	0.036 (0.038)	-0.007 (0.030)	-0.067** (0.031)
Serer	0.010 (0.013)	0.006 (0.013)	0.031** (0.012)	0.029** (0.013)	0.026** (0.013)	0.026 (0.051)	-0.083 (0.050)	-0.150*** (0.052)
Mandingue	-0.006 (0.015)	-0.006 (0.014)	0.009 (0.017)	-0.001 (0.014)	-0.010 (0.011)	-0.009 (0.051)	-0.134*** (0.047)	-0.171*** (0.056)
Diola	-0.025** (0.012)	-0.020* (0.011)	0.005 (0.019)	-0.011 (0.007)	-0.003 (0.014)	0.060 (0.081)	0.041 (0.104)	-0.031 (0.058)
Others	-0.002 (0.013)	0.004 (0.015)	0.016 (0.015)	0.010 (0.012)	0.002 (0.013)	0.049 (0.069)	0.116* (0.063)	-0.009 (0.060)
Constant	0.092*** (0.014)	0.115*** (0.014)	0.100*** (0.013)	0.066*** (0.011)	0.094*** (0.012)	0.101** (0.047)	0.235*** (0.046)	0.421*** (0.042)
Observations	6,169	6,165	6,142	6,169	6,176	2,403	2,403	2,403
R-squared	0.009	0.012	0.014	0.012	0.015	0.046	0.051	0.090

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 8. Focusing on living daughters

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Gender violence attitude					Decision on		
	Go out	Argument	Refuse sex	Burning food	Neglect child	Health	Purchases	Visits
Daughter	-0.012 (0.009)	-0.027*** (0.007)	-0.022*** (0.009)	-0.025*** (0.006)	-0.031*** (0.007)	0.082** (0.033)	0.064** (0.032)	-0.003 (0.027)
Education	-0.006* (0.003)	-0.005* (0.003)	-0.008 (0.005)	-0.008*** (0.003)	-0.002 (0.003)	0.002 (0.016)	0.002 (0.018)	-0.002 (0.012)
Wealth	-0.011*** (0.004)	-0.016*** (0.004)	-0.018*** (0.004)	-0.009** (0.004)	-0.015*** (0.003)	0.051*** (0.014)	0.032** (0.013)	0.061*** (0.016)
Polygyny	0.005 (0.015)	-0.002 (0.013)	-0.001 (0.012)	-0.001 (0.011)	0.012 (0.013)	-0.008 (0.028)	-0.064** (0.031)	-0.060* (0.032)
Urban	-0.002 (0.011)	0.005 (0.008)	0.018* (0.011)	0.012 (0.009)	0.003 (0.010)	0.070* (0.038)	0.108*** (0.039)	0.112** (0.049)
Constant	0.101*** (0.011)	0.120*** (0.012)	0.119*** (0.013)	0.083*** (0.012)	0.112*** (0.011)	0.120*** (0.037)	0.217*** (0.039)	0.343*** (0.038)
Observations	6,169	6,165	6,142	6,169	6,176	2,403	2,403	2,403
R-squared	0.007	0.011	0.011	0.007	0.011	0.046	0.044	0.079

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 9. Baseline results using the Rare Events Logistic Regression

	(1)	(2)	(3)	(4)	(5)
	Gender violence attitude				
	Go out	Argument	Refuse sex	Burn food	Neglect child
Daughter	-0.360*** (0.130)	-0.566*** (0.121)	-0.476*** (0.127)	-0.727*** (0.163)	-0.617*** (0.138)
Education	-0.064 (0.067)	-0.004 (0.066)	-0.081 (0.067)	-0.000 (0.070)	0.042 (0.064)
Wealth	-0.175*** (0.064)	-0.284*** (0.055)	-0.302*** (0.066)	-0.393*** (0.083)	-0.338*** (0.064)
Polygyny	0.258 (0.214)	0.162 (0.229)	0.127 (0.199)	0.155 (0.275)	0.305 (0.219)
Urban	-0.188 (0.173)	0.029 (0.136)	0.234 (0.180)	0.226 (0.193)	0.083 (0.177)
Constant	-2.040*** (0.148)	-1.743*** (0.147)	-1.719*** (0.162)	-1.915*** (0.224)	-1.710*** (0.152)
Observations	6,169	6,165	6,142	6,169	6,176

Clustered standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Corrected logit estimates based on the method of prior correction using the confidence interval of the proportion of 1s as the true population range.

Appendix

Table A1. Variables: Definition and measurement

Variable	Definition and measurement
Go out	Binary variable taking on 1 if a man find beating justified for the reason: wife goes out without telling husband
Argument	Binary variable taking on 1 if a man find beating justified for the reason: wife argues with husband
Refuse sex	Binary variable taking on 1 if a man find beating justified for the reason: wife refuses to have sex husband
Burning food	Binary variable taking on 1 if a man find beating justified for the reason: wife burns food
Neglect child	Binary variable taking on 1 if a man find beating justified for the reason: wife neglects the children
Health	Binary variable taking on 1 if decision on a woman's health care is made by the woman alone or jointly with her husband
Purchases	Binary variable taking on 1 if decision on large household purchases is made by the woman alone or jointly with her husband
Visits	Binary variable taking on 1 if decision on woman visiting family or relatives is made by the woman alone or jointly with her husband
Daughter	Dummy variable distinguishing men with daughters and men without daughters
Education	Educational level
Wealth	Wealth index combined
Polygyny	Dummy variable taking on 1 in case of a polygynous union
Urban	Dummy variable taking on 1 if the place of interview is an urban area
Ethnicity	Categorical variable classifying respondents into six groups: Wolof (the reference group), Poular, Serer, Mandingue, Diola, and all other groups.

Table A2. Summary statistics from the Men's dataset

<i>Variable</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Go out	6 169	0.060	0.238	0	1
Argument	6 165	0.067	0.250	0	1
Refuse sex	6 142	0.068	0.251	0	1
Burning food	6 169	0.046	0.210	0	1
Neglect child	6 176	0.065	0.246	0	1
Daughter	6 321	0.364	0.481	0	1
Education	6 321	1.047	1.001	0	3
Wealth	6 321	2.737	1.362	1	5
Polygyny	6 321	0.077	0.267	0	1
Urban	6 321	0.488	0.500	0	1

Table A3. Summary statistics from the Couple's dataset

<i>Variable</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Health	2 403	0.335	0.472	0	1
Purchases	2 403	0.357	0.479	0	1
Visits	2 403	0.481	0.500	0	1
Daughter	2 403	0.821	0.383	0	1
Education	2 403	0.665	0.933	0	3
Wealth	2 403	2.400	1.348	1	5
Polygyny	2 403	0.276	0.447	0	1
Urban	2 403	0.383	0.486	0	1

Table A4. Omitted variable tests on the baseline results

	DMP 2022 (%)	Oster 2019 (%)
	<i>Breakdown point</i>	<i>@ 1.3 x R²</i>
Beating justified for		
Going out	7.63	391.3
Argument	12.3	1143
Refusing sex	10.6	613.8
Burning food	13	1953.2
Child neglect	13	1088
Decision on		
Health	4.82	136.7
Purchases	6.74	166.2
Visits	1.48	4

Note: for Oster (2019) the critical value to rule out the influence of omitted variable bias is 100%. Higher values imply 'robustness to omitted variable bias' (Oster, 2019). In the case of Diegert et al (2022) there is no clear-cut benchmark for the 'breakdown point' (after which omitted variable can substantially influence the estimate), but values close to 10% support the conclusion that omitted variables are unlikely to drive the estimate obtained.