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The Long-term Effect of Violent Conflict on Women's Intra-household Decision-Making Power

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Abstract

Does exposure to civil war during childhood affect women's later-life intra-household decision-making power? This paper examines the long-term effects of early-life exposure to the Nigerian Civil War on women's decision-making power within the household, using data from the 2008 Nigerian Demographic and Health Survey. To identify the effects, we adopt a difference-in-differences approach which exploits variation in exposure to the civil war by year of birth and ethnicity. The results show that early-life exposure to the war decreases the likelihood of women's decision-making power within the household in adulthood. Likely mechanisms include different fertility and marriage choices as well as poorer education, health, and employment outcomes as a result of exposure to the war, which would place women in a more precarious position in the household relative to their partners.

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1 Introduction

A growing body of literature shows that adverse events such as civil conflicts during infancy and *in utero* may result in deleterious consequences not only in the immediate term but also in adulthood. In addition to studies that have shown the immediate effects of conflict on health, nutrition, birth weight and education (Ichino and Winter-Ebmer, 2004; Akresh et al., 2012a; Akresh et al., 2012b; Oskorouchi, 2019; Akbulut-Yuksel, 2014; 2017; Shemyakina, 2011, Brown, 2018), there is evidence which links early-life exposure to conflict with reduced earnings, lower labour market participation and worse fertility outcomes in later-life (Islam et al., 2016; Shemyakina, 2015; Kraehnert et al., 2019).

Despite growing evidence on the consequences of exposure to violent conflict, there has been limited research on the relationship between early-life exposure to civil conflict and women's decision-making power in adulthood specifically. Studies by La Mattina (2017) and Tsaneva et al. (2019) investigate the relationship between violent conflict and women's intra-household bargaining power in Rwanda and Mexico, respectively. Both studies find evidence of a negative relationship between women's exposure to violent conflict in adulthood and women's decision-making power in the household, but they do not study the longer-term implications of *early-life* exposure to conflict.¹

Against this background, this paper examines the effects of early-life exposure to war on women's bargaining power within the household in adulthood in Nigeria. To the best of our knowledge, this is the first paper to study the longer-term implications of exposure in childhood on decision-making power in adulthood, and to use the Nigerian Civil War as the case study. The objectives of this paper are twofold: to examine whether exposure to the Nigerian Civil War during childhood or *in utero* affects women's later-life intra-household decision-making power; and to unpack some of the mechanisms through which early-life exposure might affect women's intra-household decision-making power in adulthood.

The Nigerian Civil War, also known as the Biafran war, was fought between the Nigerian government and what is now the south-eastern region of Nigeria (known as the eastern region during the war) that attempted to secede and form an independent state of Biafra. The civil war occurred between 6 July 1967 and 15 January 1970, and it was restricted to the south-eastern region that comprises the Igbos and some other minority ethnic groups. The war had a devastating effect on this region and its people, and it is estimated that between 1 and 3 million deaths occurred (Akresh et al., 2012b; Simpson, 2014).

To undertake the analysis, we use the 2008 Nigerian Demographic and Health Survey (DHS), and a difference-in-differences approach which exploits variation in exposure to the Nigerian Civil War by year of birth and ethnicity. As we will explain in more detail in the next section, because of the nature of the Nigerian civil war, the use of ethnicity and birth cohort to identify exposure to the war in childhood is preferred over region-based identification strategies (Akresh et al., 2012b). It helps mitigate concerns with endogenous migration of individuals between childhood and adulthood associated with the use of region-based identification strategies where only current place of residence is available (as is often the case in studies of this kind that rely on DHS data).

Women's exposure to violent conflict in childhood could negatively affect women's intra-household decision-making power through a number of potential channels. Firstly, growing research highlights that exposure to shocks *in utero* and in early childhood can result in adverse consequences in adulthood. The *in utero* and infancy stages are critical for later-life outcomes, and the consequences that emanate from exposure to negative shocks, such as civil war and nutritional shocks, have been linked to among others reduced adult stature and lower education and earnings in later-life (Akresh et al. 2012b; Almond and Currie, 2011; Cunha and Heckman, 2007; Islam et al. 2016; Velásquez, 2020).²

Since the Nigerian Civil War resulted in severe nutritional shocks and other deprivations, exposure to the war could affect women's decision-making power within the household through changes in their socio-economic outcomes such as education, employment, earnings, stature, health and fertility choices or decisions. For instance, Akresh et al (2012b) investigate the long-term effects of the Nigerian Civil War on women's stature and find that exposure to the war during childhood is associated with reduced adult height. Moreover, Velásquez (2020) finds that exposure to violent conflict is associated with negative labour market outcomes for women in Mexico.

Secondly, and separate from the socio-economic impacts outlined above, exposure to civil conflict in childhood could have longer-term psychological effects which might negatively impact women's decision-making power. For example, studies have found that exposure to war is associated with an increased incidence of intimate partner violence among women, possibly linked to the normalisation of violence, especially when the civil conflict is protracted and people suffer from post-traumatic stress (Gutierrez and Gallegos, 2016; Annan and Brier, 2010).

Thirdly, civil conflict could affect marriage market sex ratios in favour of the surviving men (Brainerd, 2017; La Mattina, 2017). In Rwanda, for instance, evidence shows

that women who married after the 1994 genocide and that were exposed to high genocide intensity reported lower decision-making power within the household and higher rates of domestic violence relative to women who married before the civil conflict (La Mattina 2017).

Given our reliance on the data collected in the Nigerian DHS, we are only able to explore the first of these channels, namely that shocks in childhood have long-term socio-economic impacts that will affect women's bargaining power in the household in adulthood. Specifically, using our data, we are able to examine whether women who were exposed to the civil war in childhood have poorer education, health, and employment outcomes in adulthood as well as different marriage and fertility decisions, compared to those who were not exposed to the war.

The contributions of this paper are therefore at the intersection of two main strands of literatures. Firstly, this paper adds to a much broader literature that examines the determinants of women's intra-household decision-making power, such as women's labour market status (Anderson and Eswaran, 2009; Heath and Tan, 2015; Majlesi, 2016), gender norms (Mabsout and van Staveren, 2010), household structure (Debnath, 2015) and asset ownership (Allendorf, 2007; Mishra and Sam, 2016). Our paper adds to this literature by drawing attention to the relationship between women's exposure to violent conflict in childhood and intra-household bargaining power in adulthood (La Mattina, 2017; Tsaneva et al. 2019).

Secondly, in trying to unpack the mechanisms through which this takes place, this paper is also closely related to the literature that examines the effects of civil conflict on later-life outcomes such as education, health, labour supply, earnings, fertility and marriage decisions (Ichino and Winter-Ebmer, 2004; Akbulut-Yuksel, 2014; Kesternich et al., 2014; Shemyakina, 2011; Akresh et al., 2012a; Islam et al., 2016; Saing and Kazianga, 2019).

The findings of our analysis suggest that women exposed to the civil war in early life are less likely to have decision-making power in their households in adulthood compared to women not exposed to the civil war. Moreover, we identify outcomes such as marriage and fertility timing, educational attainment, health and labour market outcomes as potential mechanisms through which exposure to the civil war affects women's decision-making power within the household.

The relevance of this study is underscored in the growing evidence that gender equality is fundamental to sustainable development (Malik, 2013). An improvement in women's decision-making power within the household can lead to better maternal and child outcomes (Duflo, 2012; La Mattina 2017; Majlesi, 2016; Chakraborty and De, 2017).

Furthermore, improving women's outcomes and decision-making power within the household is vital from the perspective of equity.

The remainder of this paper proceeds as follows: Section 2 provides background to the Nigerian Civil War and helps motivate the identification strategy. Section 3 describes the data and empirical approach. Section 4 presents the results of the estimations, and Section 5 concludes.

2 Background to the Nigerian Civil War

The Nigerian Civil War, also known as the Biafran civil war, lasted for 30 months. It began on 6 July 1967 and ended on 15 January 1970. The civil war was fought between the federal government of Nigeria and the secessionist Republic of Biafra in the erstwhile eastern region of Nigeria. During the civil war, Nigeria consisted of three regions, namely, the northern, western, and eastern regions.³ In each region, there were dominant ethnic groups; the Hausas in the north, the Yorubas in the west, and the Igbos in the east. In the former eastern region where the civil war took place (now referred to as the south-eastern region following the later division of the country into six regions), the population of the Igbos was over 7 million, and the region was bordered by other minority ethnic groups such as the Ijaw, Ekoi and Ibibio (Udo, 1970).

The immediate cause of the Civil War was the declaration of the Republic of Biafra. It was largely as a result of dissatisfaction of the eastern region with the other parts of Nigeria, and the persecution of the Igbos resident in other regions, especially the north (Kirk-Greene, 1971). The underlying geo-political causes of the secession are complex, however some of the more immediate events that precipitated the secession were the military coup on 15 January 1966, organised by primarily Igbo army officers, the counter-coup of 28 July 1966, and the subsequent persecution and killing of the Igbos in the Northern part of the country (Kirk-Greene, 1971; Nafziger, 1972). In response to this, there was a massive return migration of Igbos seeking refuge in their homeland in the eastern region, estimated to involve around 1.5 million people (Aall 1970; Akresh et al 2012b).

Against this background of increased tension between the eastern region and other parts of the country, the Igbos declared the eastern region an independent country, the Republic of Biafra, on 30 May 1967 and this action led to a full-blown civil war that began on 6 July 1967. In addition to the heavy deployment of military might by the federal government of Nigeria, a strict blockade of the landlocked territory was instituted, and no

movement of people or essential commodities was allowed. The civil war led to the death of between 1 and 3 million people from malnutrition and the devastation associated with the war (Akresh et al., 2012b; Simpson, 2014).

Two key features of the circumstances surrounding the war are relevant in explaining the identification strategy we use (and here we follow Akresh et al. 2012b). First, because of the secession and the military blockade of the area (which prevented movement of both people and supplies), the war was fought in the eastern (now south-eastern) region with direct civilian exposure largely restricted to this area. Second, at the time of the war, most Igbos were living in their native states in the south-east, and many of those living outside the area returned there prior to the outbreak of the war in the mass migration that occurred before the war started (Aall, 1970). We can therefore use ethnicity and birth cohort to identify exposure to the civil war in childhood. This strategy is preferred to using current geographical residence (which is what is available in the DHSs), as it circumvents the issue of potentially selective migration between childhood and adulthood (as ethnicity is invariant to migration).

3 Data and Empirical Approach

3.1 Data Source

We use the 2008 Nigerian Demographic and Health Survey (DHS) in our analysis.⁴ The DHSs are large nationally representative cross-sectional surveys that provide demographic and health-related information about the respondents. The 2008 Nigerian DHS includes information on, among others, household characteristics, ethnicity, health, education, marriage, fertility, and decision-making in the household. It covered 34,070 households and 33,385 women aged 15-49. In this study, we restrict the sample to married women aged 32 to 49 years old in 2008. As explained further below, this comprises women that were born between 1958 and 1976 and who were either exposed to the civil war *in utero* or during childhood (treatment) or who were born in the six-year period after the civil war ended (control).

3.1.2 Measures of Women's Intra-household Decision-making Power

The measures of intra-household decision-making power within the household come from the survey module administered to married women or those cohabiting with a partner. Respondents were asked in a series of questions “Who usually makes decisions

about...health care for yourself; making major household purchases; making purchases for daily household needs; and visits to your family or relatives?" The response options for each item are: (i) respondent (ii) husband/partner (iii) respondent and husband/partner jointly (iv) someone else (v) other.

Two types of dependent variables are used in the analysis. Firstly, for each of the four items we create a dummy variable equal to 1 if the woman is either the sole decision-maker or she and her husband/partner jointly are decision-makers, and 0 otherwise. This is one of the most common approaches used in studies analysing decision-making power (see Heath and Tan, 2015; Majlesi, 2016 and Tsaneva et al., 2019).

Secondly, we follow Zimmermann (2018) and create a 'decision-making index' using principal component analysis based on the four dummy variables defined above, and then standardize by subtracting the mean and dividing by the standard deviation. The index is useful in that it combines the information from the four items in a more parsimonious manner, and regression coefficients can be interpreted in standard deviations.

Summary statistics in Table 1 show that about 50% of women reported to be involved in decision-making, as either the sole or joint decision-maker, on their own health care, 44% reported being involved in decisions on large household purchases, 57% reported being involved in decisions on household purchases for daily needs, and 61% reported being involved in decisions on visits to family or relatives.⁵

[Table 1 here]

3.2 *Empirical Approach*

To estimate the causal relationship between early-life exposure to the Nigerian Civil War and women's intra-household decision-making power in adulthood, we adopt a difference-in-differences strategy that exploits the variation in exposure to the civil war by birth cohort and ethnicity. As described above, the Nigerian Civil War was restricted to the eastern region (now the southeast geo-political zone) of the country (see Figure 1), comprising the majority Igbo group and some other minority ethnic groups. The political instability before the civil war across some parts of Nigeria, especially in the northern region, and the targeting of the Igbos, triggered the return of most Igbos to the eastern region for safety. After the declaration of the eastern region as an independent state of Biafra, which the federal government of Nigeria strongly resisted, federal troops invaded the region and imposed a blockade of the

landlocked territory, with entry and exit severely restricted. The war was therefore fought largely in the south-east region and exposure was largely concentrated among the ethnic groups from that region (Akresh et al. 2017).

Using ethnicity and birth cohort as an identification strategy improves on previous studies that used *current* geographical residence to identify exposure to war in childhood (for example Gutierrez and Galegos, 2016; La Mattina and Shemyakina, 2017), as it minimises the problem of selective migration between childhood and adulthood. Unfortunately, the DHSs only contain *current* geographical residence, while it is residence in childhood or at the time of the conflict that is of relevance.⁶

[Figure 1 here]

Based on this identification strategy, we estimate equation (1) below. Where the dependent variables are the binary variables capturing decision-making on the various items outlined above, we estimate a probit model (and we display the marginal effects in the results tables). For the regressions where the decision-making index is used as the dependent variable, we use OLS estimation.

$$Pr(Y_{ijt}) = \alpha + \beta_1 (\text{war ethnicity}_j * \text{war cohort}_{it}) + \beta_2 \text{war ethnicity}_j + \beta_3 \text{war cohort}_{it} + \beta_4 X_{ijt} + \delta_r + \varphi_r + \varepsilon_{ijt} \quad (1)$$

where Y_{ijt} is intra-household decision-making power for woman i belonging to ethnicity j and born in year t . *War ethnicity* refers to the Igbo and other minority ethnic groups (Adoni, Adun, Annang, Efik, Ekoi, Ibibio, and Ijaw) in the southeast region of the country where the war was fought, and *war cohort* refers to the cohort of women who were born between 1958 and 1970 and were therefore exposed to the war *in utero* or during childhood up to the age of 12 years (which is the maximum age of exposure captured in the 2008 DHS). The coefficient β_1 on the interaction term captures the effect of exposure to the civil war on women's intrahousehold decision-making power within the household for the war-exposed group relative to the non-exposed group. See Table 2 for a summary of the treatment and control groups.

Equation 1 also includes X_i , a vector of individual and household-level controls containing woman's age, woman's religion dummies, woman's education dummies, an indicator for urban residence, and household wealth dummies. Our preferred specification

also controls for state, ethnicity, and cohort fixed effects. ε_{ijt} is a random idiosyncratic error term. Standard errors are clustered at the regional level to account for serial correlation.

[Table 2 here]

Further, to identify whether the age at which children were exposed to the war matters, we also disaggregate *war cohort*_{it} in equation (1) into four birth cohorts, namely those exposed *in utero* (born between February and October 1970), those exposed at ages 0-4 (born 1966-1970), those exposed at ages 5-8 (born 1962-1965) and those exposed at ages 9-12 (born 1958-1961). The effect of the civil war on women's intra-household bargaining power could vary across the different age cohorts if particular stages are critical in a child's growth and development (Akresh et al., 2012b). Negative shocks (nutrition, health, conflict) during critical periods of child development can lead to irreversible damage in later-life (Cunha and Heckman, 2007). In other words, exposure to the thirty-month civil war between the ages 0 and 4 could have differential impacts compared to exposure between the ages 9 and 12.

Indeed, a growing number of studies have established that shocks *in utero* and during early childhood could have persistent and profound consequences on education, earnings, health, labour market participation, and socioeconomic status (Almond, 2006; Almond and Currie, 2011; Almond et al. 2012).⁷ These outcomes have been identified in our analysis as some of the potential mechanisms through which the Biafran civil war is likely to negatively affect women's intra-household bargaining power in adulthood.

4 Results

4.1 Civil war and intra-household decision-making power

Tables 3 and 4 show our main set of findings. Table 3 displays the OLS coefficients from a stepwise regression analysis of the effects of exposure to the war on intra-household decision-making power in adulthood, where the dependent variable is the decision-making index. Table 4 shows the marginal effects from probit regressions where the dependent variables are the individual indicator variables that take the value of 1 if the woman is the sole or joint decision-maker on each of the four decision-making outcomes (and 0 otherwise). Both tables show the results for the war-exposed group overall, and for the age-disaggregated groups, namely those exposed *in utero*, between the ages of 0-4, 5-8, and 9-12.

Columns 1-4 in Table 3, which show the results where the standardised decision-making index is the dependent variable, suggest a negative and robust relationship between exposure to war in early life and women's decision-making in adulthood. After progressively including cohort, ethnic and state fixed effects as well as the full set of control variables, the coefficient in column 4, our preferred specification, indicates that decision-making decreased by 0.13 standard deviations as a result of exposure to the war in early life.

The step-wise regression analysis in columns 1-3 of Table 3 estimates the coefficients on the war-exposed cohort and war-exposed ethnicity dummies directly for illustration. In column 3 (which also includes controls and state fixed effects), the positive coefficient on the war-exposed ethnicity dummy suggests that women in these ethnic groups are on average *more* likely to have decision-making power in their household compared to women in the non-war-exposed ethnic groups. However, the coefficient on the interaction term shows that women in the war-exposed ethnic groups who were actually exposed to the war in childhood, i.e. the 'treatment' group of interest, have *less* decision-making power compared to those in the war-exposed ethnic groups but who were born after the war ended. Our preferred specification is that in column 4, however, which instead of including dummies variables directly in the equation, controls more thoroughly for ethnicity and cohort using fixed effects (as is done in Akresh et al, 2012b; La Mattina, 2017 and many others). We use the specification in column 4 for the remaining estimations.

The final column of Table 3 shows the results when disaggregated by the age at which women were exposed to the war in childhood, to test whether there are varying effects. The negative coefficients suggest that exposure to the war affected women's decision-making power at all ages, however the effect is significant at conventional levels only for those in the 3 younger categories (i.e. those exposed in utero, and between the ages of 0-4 and 5-8). The coefficients are largest for those exposed between the ages of 0-4 and 5-8. Post-estimation tests on equality of coefficients show that there are significant differences between the coefficients on the age cohorts *in utero* and 0-4, and between the coefficients on the age cohorts 5-8 and 9-12. For both tests of equality of coefficients, the F-statistic indicates that we can reject the null hypotheses (H_0) because $P < 0.05$ and conclude that there are significant differences in the coefficients between these age cohorts. We will reflect further on the age-disaggregated effects when we examine the mechanisms below.

Next, Table 4 shows the results using our preferred specification where the dependent variables used are the indicator variables for each item in the decision-making index. All four coefficients in row 1 which show the overall results (i.e. not disaggregated by age) are

negative, although the coefficients on the first two decision-making items are larger and also significant. In other words, it would seem that exposure to war matters particularly for decision-making where the decisions are perhaps more consequential, namely around women's health and large household purchases (as opposed to household purchases for daily needs and visits to family or relatives). The coefficients indicate that war exposure reduces decision-making on women's health by 6 percentage points and on large household purchases by 7 percentage points. When disaggregated by age cohort, the results across the four items tend to show quite a bit of variation, but on the whole larger negative effects are recorded for the younger three categories.

4.2 *Potential Mechanisms*

In Table 5 we explore the potential mechanisms through which women's exposure to the Nigerian Civil War could affect their intra-household decision-making power in adulthood. From the existing literature, the potential channels we can investigate include outcomes such as marriage and fertility choice, educational attainment, labour market participation, stature, and the education gap between partners (Manser and Brown, 1980; Aizer 2010; Anderson and Eswaran, 2009; Bobonis et al. 2013; Hidrobo and Fernald 2013; Antman, 2014; Majlesi, 2016).

More specifically, using the data available in the DHS, we test whether exposure to the war during childhood is associated with age at first birth, age at first marriage, number of births, years of education, the spousal education gap, the likelihood of wage employment and height in adulthood. Table 5 shows the results from this series of regressions for the war exposed group overall, and disaggregated by age cohort.

Column 1 shows that that, overall, exposure to the civil war is associated with a decrease in age at first birth by 0.65 years, while column 2 shows that this is driven by the negative effects for the cohorts exposed between 0-4, 5-8 and 9-12. In line with this, exposure to the war during childhood is also negatively related to age at first marriage which is on average 0.46 years lower for the war exposed group overall (column 3), driven largely by a significant negative effect for those exposed between the ages of 9-12 (column 4). There appears to be no relationship though between war exposure and the total number of births (columns 5 and 6). The results suggest rather that war exposure leads to different marriage and fertility *timing* decisions that might make women more vulnerable and therefore less likely to have decision-making power in their households.

Columns 7 and 8 in Table 5 show that women's exposure to the civil war is associated with a decline in schooling of 0.16 years, with a particularly large negative effects for those exposed between the ages of 5-8 (0.25 fewer years of schooling) and 9-12 years (0.50 fewer years of schooling), although only the latter coefficient is statistically significant. Similarly, women exposed at these ages also have a large and significant spousal education gap (of 0.23 and 0.46 years respectively), which would place them in a weaker position relative to their partners (see columns 9 and 10). That the effects are largest among those who were of school-going age during the war would be expected, and lends some weight to our identification strategy. These results are also consistent with previous studies on the relationship between exposure to civil conflict and accumulation of schooling (Shemyakina, 2011; Chamarbagwala and Moran, 2011; Bundervoet and Fransen, 2018).

The results in columns 11 and 12 show the association between women's exposure to the civil war and working for a wage. Only women exposed to the civil war *in utero* and between ages 0-4 are less likely to work for wage relative to women not exposed to the civil war. The negative effects are large however at 11 and 6 percentage points respectively.

Finally, the results in columns 13 and 14 indicate that exposure to the war is associated with reduced height in adulthood by 0.82 cm overall. Shorter stature would make women physically more vulnerable relative to men, but it is also related to many of the outcomes in adulthood which are important for intra-household bargaining power. For instance, there is growing evidence on the association between height, cognition, skills and labour market outcomes (Vogl, 2014; Kim and Han, 2017; LaFave and Thomas, 2017). When disaggregated by age cohort of exposure, the results indicate a 0.66 cm reduction for *in utero* exposure, a 0.97 cm reduction for exposure between 0-4, a 0.96 cm reduction for exposure between 5-8, and a 0.24 cm reduction for exposure between 9-12. These results are consistent with those of Grimard and Laszlo (2014) for Peru, and Akresh et al. (2012b) for Nigeria (who similarly found long-term negative effects of the Nigerian Civil War on women's stature in adulthood across the age cohorts that were exposed). Although we find negative effects across the age cohorts, the substantial negative effects on adult stature for exposure *in utero* and during infancy are consistent with work that examines the links between shocks, such as civil war and nutrition, in the critical phases of early life and poorer adult outcomes (Barker, 1990; Majid, 2015).

In summary, the analysis in this section suggests a number of pathways through which exposure to the war in childhood might affect decision-making power in the household in adulthood. Specifically, we find for the cohorts exposed at younger ages (*in utero* and

between 0-4), shorter stature and a lower likelihood of wage employment are potential mechanisms, while for the cohorts exposed between the ages of 5-8 and 9-12, marriage and fertility timing and poorer education outcomes (both own and relative to the spouse) are relevant.

Of course, this analysis is purely suggestive, as there are other mechanisms that may be important, but which we are unable to test for given the data available in the DHS. For example, even after accounting for the impacts of the war on long-term socio-economic outcomes, there may be persistent scarring due to the psychological effects of exposure to the war during a sensitive and impressionable period in childhood. A more formal and thorough analysis of mechanisms would require additional data and ideally reliable instruments for socio-economic outcomes such as earnings or employment. Nonetheless, our findings here are instructive, and are largely consistent with a broader literature on the impacts of war and on the determinants of bargaining power in the household.

4.3 *Robustness checks*

To test the robustness of our difference-in-differences strategy which assumes parallel trends, we estimate a series of placebo regressions, the results of which are presented in Tables 6 and 7. In a similar vein to Gutierrez and Gallegos (2016) and Weldeegzie (2017), we exclude the main war-exposed ethnicities (the Igbo and other ethnic minorities) and conduct the analysis by placebo-treating ethnic groups in the northern part of the country (Kanuri, Hausa, and Fulani), with the remaining ethnic groups as the control. We choose ethnic groups from the northern part of the country as this area would have been the most geographically distant from where the war was physically fought and therefore the groups from this region least likely to be affected. Reassuringly, the results from the placebo regressions show no statistically significant link between exposure to civil conflict during childhood and women's intra-household decision-making power (Table 6) or the determinants of decision-making power (Table 7).

In the next set of regressions we use an alternative identification strategy where instead of using ethnicity and birth cohort to identify war exposure, we use region and birth cohort. Although not our preferred strategy, this geography-based approach is commonly used in studies that try to identify the impacts of war, and therefore may be of interest to researchers. We identify as war-exposed women living in states carved out from the now defunct eastern region (Akwa Ibom, Anambra, Cross River, Imo, Rivers, Abia, Enugu,

Bayelsa and Ebonyi), which formed the Republic of Biafra during the war, with the other states as the control group.

An important limitation of the DHS surveys, and this identification strategy, is the absence of information on place of residence *at birth or during childhood*, when the war took place. The surveys provide information only on the respondents' *current* state or region of residence. The potential for endogenous migration between childhood and adulthood is therefore a threat to this identification strategy. As a workaround, we estimate the regressions separately for 'movers' and 'non-movers'. The DHS survey includes information on the number of years the respondent has lived in their current place of residence, and so we can define movers as those who have moved from their current place of residence since birth, and non-movers as those who have always lived in their current place of residence since birth.

For illustration (and due to space constraints), we only show the results of the regressions using the decision-making dummies in Appendix Table A.1. We find negative effects of war exposure (defined by region) on decision-making power for a number of the age cohorts in both the mover and non-mover groups. However, of concern is that the majority of the sample is classified as having moved since birth (approximately 5000 of the 7300 women in the sample). This is likely because classifying as movers those who have *ever* moved from their current place of residence is likely picking up smaller intra-state moves as well as longer-distance moves between states or regions. Indeed, evidence from the Federal Office of Statistics (1999, 2000) suggests that most Nigerians (in the region of 95%) remain resident in their states of birth, with most migration in Nigeria occurring within states, from rural to urban areas, and not across states. Nonetheless, this exercise shows the results on decision-making power to be largely robust and it further illustrates why using ethnicity remains our preferred identification approach.

5 Conclusion

This paper contributes to the literature on the long-term effects of exposure to civil conflict on outcomes in later life, by exploring the impact on women's intra-household decision-making power in adulthood. To do so, it exploits variation in exposure to the Nigerian civil war by birth cohort and ethnicity, a more reliable identification strategy than using geography-based approaches with the DHS data (Akresh et al., 2012b).

The results of this study reveal that exposure to the civil war during childhood is associated with a decline in women's intra-household decision-making power in adulthood.

This is the case when we use a composite decision-making index and when we explore the individual responses to each of the decision-making questions in the survey. There is some suggestion that war exposure matters especially for some of the more substantial decisions, such as on women's health and large household purchases (as opposed to household purchases for daily needs and visits to family or relatives). Moreover, using the index of decision-making power, our findings suggest negative effects of exposure to the war on decision-making power regardless of the age at which women were exposed in childhood, although the negative effects are larger for those exposed between the ages of 0-4 and 5-8 compared to those exposed *in utero* and between ages 9-12.

Finally, we explore some of the potential mechanisms through which exposure to civil conflict during childhood might affect intra-household decision-making power in adulthood. Drawing on the broader literature on the determinants of bargaining power, we use the data available in the DHS to test whether exposure to the war during childhood is associated with age at first birth, age at first marriage, number of births, years of education, the spousal education gap, the likelihood of wage employment and height in adulthood. We find evidence that war exposure in childhood is associated with marriage and fertility choices, height, education, and labour market outcomes. For the cohorts exposed at younger ages (*in utero* and between 0-4), there tend to be larger negative effects on adult stature and the likelihood of wage employment, while for the cohorts exposed between the ages of 5-8 and 9-12, marriage and fertility timing and poorer education outcomes (both own and relative to their spouse) appear to be more relevant.

This analysis of pathways is purely suggestive however, as there are other mechanisms which may be important but which we are unable to analyse given the data available in the DHS. For instance, beyond the long-term effects on socio-economic outcomes, there may be persistent psychological effects of exposure to war that influence women's behaviour in adulthood. Nonetheless, our findings are instructive, and are largely consistent with a broader literature on the impacts of exposure to war (and other shocks) in early life.

Understanding how early life exposure to civil conflict affects women's intra-household decision-making power is important for post-war policies targeted at cushioning the deleterious consequences of civil conflict. Further analysis of some of the potential pathways that lead to weaker bargaining power and how (and why) these differ by age at exposure will be a fruitful area for future research.

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Declaration of Interest Statements

The authors declare there is no conflict of interest.

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Tables

Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Observations
<i>Women as sole or joint decision-maker</i>			
Woman's own health care	0.495	0.500	7,609
Large household's purchases	0.439	0.496	7,607
Purchases for daily needs	0.567	0.496	7,608
Visit to family or relatives	0.609	0.487	7,606
<i>Determinants of bargaining power</i>			
Age at first birth	20.381	5.069	8,136
Age at first marriage	18.671	5.457	8,336
Number of children ever given birth to	5.792	2.881	8,526
Working for a wage	0.595	0.491	6,857
Diff. in education b/w partners	0.351	1.359	8,240
Women's height (cm)	158.819	7.378	8,331
Years of schooling	4.903	5.767	8,517
<i>Other control variables</i>			
Urban residence	0.309	0.462	8,526
Household wealth-Quintile 1	0.233	0.423	8,526
Household wealth-Quintile 2	0.198	0.399	8,526
Household wealth-Quintile 3	0.194	0.395	8,526
Household wealth-Quintile 4	0.180	0.384	8,526
Household wealth-Quintile 5	0.196	0.397	8,526
Religion-Christian	0.531	0.499	8,473
Religion-Islam	0.447	0.497	8,473
Religion-Traditional	0.020	0.141	8,473
Religion-Other	0.002	0.043	8,473
Women's age	39.110	5.108	8,526
Women's education-no education	0.459	0.498	8,526
Women's education-incomplete primary	0.0738	0.261	8,526
Women's education-complete primary	0.167	0.373	8,526
Women's education-more than primary	0.300	0.458	8,526
Household size	6.178	3.241	8,526

Source: Authors' calculations using the 2008 Nigerian Demographic Health Survey

Table 2: Data Design (Treatment and Control Groups)

Treatment		Control	
Ethnicity	Year of birth-cohorts	Ethnicity	Year of birth-cohorts
Igbo	1958-1970 (Oct.)	Fulani	1958-1976
Adoni	1958-1970 (Oct.)	Hausa	1958-1976
Adun	1958-1970 (Oct.)	Igala	1958-1976
Annang	1958-1970 (Oct.)	Kanuri/Beriberi	1958-1976
Ekoi	1958-1970 (Oct.)	Tiv	1958-1976
Ibibio	1958-1970 (Oct.)	Yoruba	1958-1976
Ijaw/Izon	1958-1970 (Oct.)	Others	1958-1976
		Igbo	1970 (Nov.)-1976 (Dec.)
		Adoni	1970 (Nov.)-1976 (Dec.)
		Adun	1970 (Nov.)-1976 (Dec.)
		Annang	1970 (Nov.)-1976 (Dec.)
		Ekoi	1970 (Nov.)-1976 (Dec.)
		Ibibio	1970 (Nov.)-1976 (Dec.)
		Ijaw/Izon	1970 (Nov.)-1976 (Dec.)

Data source: 2008 Nigerian Demographic Health Survey

Table 3: Conflict and Intra-household Decision-making power (OLS coefficients)

Dependent Variable: Index of decision-making power	(1)	(2)	(3)	(4)	(5)
War exposed cohort*War ethnicity	-0.058*	-0.076*	-0.074*	-0.134*	
	(0.031)	(0.045)	(0.045)	(0.079)	
War exposed cohort	-0.072	-0.015	-0.007	No	
	(0.044)	(0.035)	(0.030)		
War ethnicity	-0.461*	-0.109*	0.137*	No	
	(0.247)	(0.051)	(0.059)		
In utero during War*War Ethnicity					-0.047*
					(0.026)
Born_1966-1970 * War Ethnicity					-0.087*
					(0.042)
Born_1962-1965 * War Ethnicity					-0.103**
					(0.039)
Born_1958-1961 * War Ethnicity					-0.059
					(0.065)
Control variables	No	Yes	Yes	Yes	Yes
State fixed effect	No	No	Yes	Yes	Yes
Ethnicity fixed effect	No	No	No	Yes	Yes
Cohort fixed effect	No	No	No	Yes	Yes
R-squared	0.012	0.214	0.318	0.323	0.337
Observations	7,504	7,504	7,504	7,504	7,504

Note: The OLS regressions use reghdfe Stata command to control for state, ethnicity, and cohort fixed effects. *Significant at 10%, **significant at 5%, and *** significant at 1%. All regressions use clustered standard errors at the regional level. The control variables used in the regression include woman's age, woman's religion dummies (Catholic, other Christian denominations, Muslim and Traditional; Traditional is the omitted category), education dummies (incomplete primary, complete primary, more than primary; no education is the omitted category), household size, urban residence, and wealth dummies (poorer, middle, richer, richest; poorest is the omitted category).

Table 4: The effect of women's exposure to civil war on (sole or joint) decision-making (marginal effects from probit regressions)

Dependent variables	Woman's own health care		Large HH purchases		HH purchases for daily needs		Visits to family or relatives	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
War exposed cohort*War ethnicity	-0.056*** (0.017)		-0.074* (0.044)		-0.012 (0.036)		-0.023 (0.022)	
In utero*War Ethnicity		0.006 (0.032)		-0.093 (0.094)		-0.118*** (0.041)		-0.019 (0.042)
Born_1966-1970*War Ethnicity		-0.108*** (0.023)		-0.036* (0.019)		-0.020 (0.039)		0.002 (0.030)
Born_1962-1965*War Ethnicity		-0.039 (0.033)		-0.071** (0.034)		0.032 (0.049)		-0.019 (0.028)
Born_1958-1961*War Ethnicity		-0.005 (0.029)		-0.081** (0.040)		0.005 (0.058)		-0.051 (0.042)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ethnicity FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.202	0.201	0.201	0.169	0.261	0.262	0.214	0.214
Observations	7,508	7,508	7,505	7,505	7,505	7,508	7,509	7,509

Note: The dependent variable is an indicator variable equal to 1 if the woman is either the sole decision-maker or she and her husband/partner are joint decision-makers for each of the decision-making outcomes, and 0 otherwise. * Significant at 10%, **significant at 5%, and *** significant at 1%. All regressions use clustered standard errors at the regional level. Control variables are the same as in Table 3 above.

Table 5: Exposure to civil war and determinants of women's decision-making power (OLS coefficients)

Variables	Age at first birth		Age at first marriage		No. of births		Years of education		Diff. in educ. between partners (M-F)		Wage employment		Height (cm)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
War cohort*WE	-0.649** (0.221)		-0.355* (0.173)		0.091 (0.083)		-0.162** (0.057)		0.107* (0.055)		-0.019 (0.014)		-0.821* (0.413)	
In utero*WE		0.818* (0.383)		0.718 (0.580)		-0.090 (0.197)		-0.009 (0.090)		0.061 (0.130)		-0.109*** (0.024)		-0.644* (0.002)
1966-1970 * WE		-0.526** (0.1847)		-0.418 (0.369)		0.078 (0.171)		0.047 (0.023)		0.042 (0.059)		-0.058*** (0.0055)		-0.971* (0.440)
1962-1965 * WE		-0.522* (0.308)		0.014 (0.322)		0.091 (0.122)		-0.250 (0.104)		0.228*** (0.036)		-0.007 (0.040)		-0.958** (0.375)
1958-1961 * WE		-1.662** (0.494)		-1.201*** (0.297)		0.200 (0.298)		-0.496*** (0.123)		0.455*** (0.121)		-0.009 (0.025)		-0.235 (0.189)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ethnicity FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.171	0.173	0.316	0.318	0.383	0.383	0.606	0.607	0.222	0.069	0.297	0.424	0.050	0.047
Observations	7,229	7,229	7,448	7,448	7,448	7,448	7,433	7,443	7,370	7,370	5,912	5,912	7,286	7,286

Note: The regressions use reghdfe Stata command to control for state, ethnicity, and cohort fixed effects. * Significant at 10%, **significant at 5%, and *** significant at 1%. All regressions use clustered standard errors at the regional level. Control variables are the same as in Table 3 (although columns 7 and 8 do not use education dummies as control variables). Observations vary in each of the columns due to missing values for some of the variables.

Table 6: Placebo regressions of war exposure and decision-making power (joint or sole)

	Decision-making index		Woman's own health care		Large HH purchases		HH purchases for daily needs		Visits to family or relatives	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
War exposed cohort*WE	0.296 (0.153)		-0.210 (0.277)		-0.477 (0.366)		-0.006 (0.050)		-0.156 (0.194)	
In utero during War*WE		-0.091 (0.088)		-0.548 (0.471)		-0.442 (0.331)		-0.073 (0.105)		-0.029 (0.030)
Born_1966-1970 * WE		-0.211 (0.165)		-0.619 (0.472)		0.089 (0.353)		0.148 (0.519)		-0.071 (0.187)
Born_1962-1965 * WE		-0.233 (0.161)		-0.102 (0.529)		-0.029 (0.052)		-0.553 (0.467)		-0.240 (0.173)
Born_1958-1961 * WE		0.024 (0.019)		-0.007 (0.043)		0.051 (0.077)		0.059 (0.205)		-0.036 (0.056)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ethnicity fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.323	0.347	0.154	0.162	0.131	0.135	0.163	0.192	0.136	0.144
Observations	5,940	5,940	5,942	5,942	5,940	5,940	5,940	5,940	5,940	5,940

Note: Columns 1 and 2 show the OLS coefficients and columns 3 to 10 show marginal effects from probit regressions. The OLS regressions use the reghdfe Stata command to control for state, ethnicity, and cohort fixed effects. * Significant at 10%, **significant at 5%, and *** significant at 1%. All regressions use clustered standard errors at the regional level. The control variables used in the regressions are the same as in Table 3.

Table 7: Placebo regressions of the determinants of women's decision-making power (OLS coefficients)

Dependent variable	Age at first birth		Age at first marriage		No. of births		Years of education		Diff. in educ btw partners (M-F)		Wage employment		Height (cm)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
War cohort*WE	0.0111 (0.037)		-0.028 (0.025)		-0.062 (0.077)		-0.044 (0.055)		-0.016 (0.013)		-0.021 (0.015)		0.019 (0.034)	
In utero*WE		0.578 (0.431)		0.328 (0.299)		0.136 (0.116)		0.225 (0.537)		-0.111 (0.083)		-0.030 (0.032)		-0.983 (0.504)
1966-1970 * WE		0.399 (0.228)		0.087 (0.0160)		0.009 (0.129)		0.177 (0.143)		0.083 (0.064)		0.012 (0.018)		0.599 (0.783)
1962-1965 * WE		0.642 (0.351)		-0.174 (0.369)		0.158 (0.334)		-0.383 (0.751)		-0.011 (0.061)		0.009 (0.028)		0.337 (0.619)
1958-1961 * WE		0.736 (0.489)		-0.227 (0.247)		0.107 (0.147)		0.058 (0.636)		0.057 (0.083)		0.015 (0.041)		1.149 (0.698)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ethnicity FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.143	0.157	0.283	0.327	0.268	0.366	0.470	0.608	0.167	0.202	0.291	0.306	0.021	0.045
Observations	6,229	6,229	6,397	6,397	6,397	6,397	6,397	6,397	6,313	6,313	4,978	4,978	6,246	6,246

Note: The regressions use the reghdfe Stata command to control for state, ethnicity, and cohort fixed effects. * Significant at 10%, **significant at 5%, and *** significant at 1%. All regressions use clustered standard errors at the regional level. Control variables are the same as in Table 3 (although columns 7 and 8 do not use education dummies).

Appendix

Table A.1: Women's exposure to civil war and decision-making using war region (marginal effects from probit regressions) – movers and non-movers

Dependent variable	Movers				Non-movers			
	Own health care	HH purchases	Daily needs	Visit to family	Own health care	HH purchases	Daily needs	Visit to family
In utero during War*War Region	-0.005 (0.103)	-0.127* (0.077)	-0.195*** (0.061)	-0.018 (0.059)	-0.079 (0.108)	-0.053 (0.151)	-0.013 (0.133)	-0.055 (0.040)
Born_1966-1970 * War Region	-0.245*** (0.060)	-0.021 (0.028)	-0.043 (0.075)	-0.027 (0.042)	-0.152** (0.065)	-0.073* (0.049)	0.005 (0.068)	0.049 (0.082)
Born_1962-1965 * War Region	-0.120 (0.106)	-0.063 (0.060)	0.026 (0.978)	-0.038 (0.042)	-0.062 (0.047)	-0.112*** (0.034)	0.004 (0.113)	-0.004 (0.095)
Born_1958-1961 * War Region	0.080 (0.090)	-0.039 (0.060)	0.033 (0.072)	-0.010 (0.060)	-0.117** (0.049)	-0.163*** (0.034)	-0.089* (0.050)	-0.160** (0.070)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ethnicity FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.204	0.169	0.267	0.200	0.253	0.222	0.305	0.283
Observations	4,986	4,991	4,992	5,043	2,325	2,362	2,364	2,225

Note: The dependent variables are indicator variables that take the value 1 if a woman is either the sole or joint decision-maker in her household and 0 otherwise. *Significant at 10%, **significant at 5%, and *** significant at 1%. All regressions use clustered standard errors at the regional level. Control variables are the same as in Table 3.

Figures

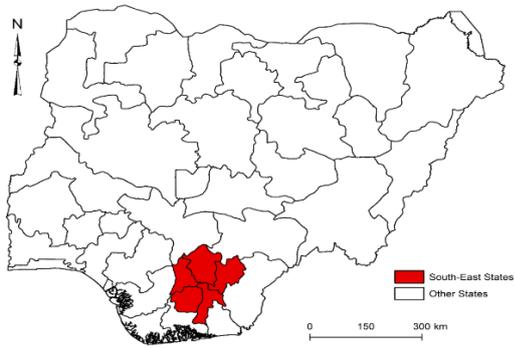


Figure 1. Map of Nigeria indicating the south-eastern states that formed the Republic of Biafra.

¹ We use the terms decision-making power and intra-household bargaining power interchangeably.

² The effects of early life events such as exposure to civil war in utero and during infancy are related to the fetal origins hypothesis and the critical programming period. Shocks related particularly to the first 1,000 days of the child's life (including in utero) are presumed to have deleterious consequences in later life (Barker, 1990; Majid, 2015).

³ These three main regions were subsequently demarcated into six geopolitical regions, namely the northeast, northwest, north-central, south-south, south-west and south-east, the latter being the region where the civil war was fought. These six regions are further divided into 36 states.

⁴ The study uses only the 2008 wave of the Nigerian DHS because a significant number of women that were exposed to the war in childhood were not eligible for interview in the 2013 DHS based on their age. The Nigerian DHS interviews women within the age range of 15-49. Those born in 1967, immediately when the civil war started, were 46 years in 2013 and hence only a small sample of war-exposed women would have been included in the 2013 sample.

⁵ Although not shown in Table 1, the data indicate that 11% of women were sole decision-makers on their health, 7% were sole decision-makers on large household purchases, 20% were sole decision-makers on household purchases for daily needs, and 13% were sole decision-makers on visits to relatives and family. As an additional check, we created a set of binary dependent variables equal to one if the women was the sole decision-maker on each item (zero otherwise) and we found our regression results were telling a similar story. These additional estimations can be made available by the authors on request.

⁶ To try and address the problem of migration, these papers restrict their samples to those who had never moved since birth, but in doing so they lose approximately 50 percent of their initial sample (Gutierrez and Galegos, 2016; La Mattina and Shemyakina, 2017) probably because small-distance migrations are also being captured (i.e. within state or subplace movements). This is likely to lead to biased results.

⁷ Akresh et al. (2017) and Almond et al. (2017) identified the following as the reasons negative shocks in early-life matter: (i) early childhood is characterised by a period of rapid growth and children are highly sensitive to nutritional deprivation and (ii) negative shocks alter the developmental path through changes in tissue structure and metabolic and endocrine processes.