

DISCUSSION PAPER SERIES

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Coast: Experimental Evidence from Rural
Areas**

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ABSTRACT

Intra-Household Negotiation in Ivory Coast: Experimental Evidence from Rural Areas*

Is the impact of women's bargaining power on the welfare of the household always positive? We address this question by developing a novel experimental measure of bargaining power over family expenditures in Ivory Coast and studying its determinants. We find that men prioritise food expenditures, women prioritise the transfers to parents and the two of them show similar revealed preferences with respect to educational expenditures. The bargaining power of the woman over the three categories of expenditures of interest is correlated with the education of the wife, the income of the husband and the bride price. The results contribute to the debate on the superior concern of the woman about child welfare and could have interesting policy implications.

JEL Classification: C93, J43, O55

Keywords: bargaining power, public goods games, revealed preferences, Côte d'Ivoire

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1. Introduction

The bargaining power of household members and its impact on indicators of household and inter-generational welfare have attracted the attention of researchers for decades. One of the most prolific branches of this type of literature studies the influence of female bargaining power on the allocation of household resources across different expenditure categories. According to the central hypothesis, in favour of which the majority of early empirical studies find evidence, the bargaining power of the woman increases the types of expenditures that improve the welfare of the household, especially that of children (see for instance Hoddinott and Haddad, 1995; Duflo and Udry, 2004). This hypothesis has recently found its theoretical foundation in the “the mother cares most” postulate of Blundell et al (2005). To arrive at this postulate, the literature relying on standard surveys has very often used variables like the control of the woman over certain types of family resources (for example, the possession of land or goods brought at the time of marriage) or cultural assets like the bride price or having given birth to at least one boy as measures of women’s bargaining power and estimated their impact on various intra-household decisions (see for instance Doss, 2013 for review of this type of literature). The main problem with this type of approach is that it is based on correlates and not on direct measures of bargaining power. Moreover, their identity with the latter is assumed instead of being proved. For instance, a high bride price could have a positive effect on the bargaining power of the bride, but the effect could also be negative due to the reduced ability of the woman to leave the marriage and return to her parents’ house (Corno, Hildebrandt and Voena, 2020).

The conceptual and empirical tendencies of these early studies have been put into question in at least two contexts. To begin with, the results of recent research have challenged the proposition that the bargaining power of the woman improves all aspects of child welfare. On the one hand, Chattopadhyay and Duflo (2004) find at the community level that women and men have different preferences for education and basic amenities like water. Other researchers observe similar patterns at the household level. Duflo and Udry (2004) find that an increase in the income of the wife results in an increase in food expenditures, while an increase in the income of the husband stimulates an increase in educational expenditures. Hoddinott and Haddad (1995) show that higher resources in the hands of women increase the expenditures on food, but do not enhance other types of child related expenditures.

On the other hand, the experimental literature has developed ways of observing (instead of assuming or estimating empirically) both the revealed preferences of partners with respect to different family expenditures and their respective bargaining powers. Most of this literature tests the hypothesis of efficient allocation of family resources in the context of public goods games (Iversen et al, 2006; Kebede et al, 2011; Munro, 2015). In addition, a small group of independent studies in the domain of social psychology has estimated the revealed preferences and the bargaining power of partners by asking them to make hypothetical choices. For instance, Dosman and Adamowics (2006) have studied the choice of camping sites of Canadian couples, Lindhjem and Navrud (2009) have examined the preferences for biodiversity in Norway, and Bateman and Munro (2009) have compared the individual and collective preferences for quality nutrition. In all cases, the researchers ask participants in the games to take decisions individually and together and then attribute the bargaining power of each participant to the closeness of his/her individual preferences and those demonstrated when the partners took decisions together.

Obviously, the case where the choice made together is close to an individual's personal preferences is indicative of a higher bargaining power.

We start by proposing a novel experimental method of bargaining power estimation that benefits from the strengths of both types of experiments, while trying to imitate as much as possible the process of decision making in the household. While we base our measure of bargaining power on the social psychology literature, we position the revealed preference games within (and as a natural stage of) incentivised public goods games which capture partners' propensity to prioritise their own interests at the expense of those of the family. To the best of our knowledge, this is the first article which studies the revealed preferences of partners towards essential family expenditures in a developing country, while also trying to understand the efficiency of the allocation of household resources.

Moreover, we study the determinants of household bargaining power in rural Ivory Coast by using variables that a large proportion of the empirical literature treats as direct measures of such power. The idea is to contribute to the debate on the superior interest of the woman in the welfare of the family and its determinants. This would allow us to take a position on the politics of social transfers aimed at women, with an application to the Ivoirian context, which are based on the assumption that women would prioritise child interests more than men.

The rest of the paper is organised as follows. The next section describes the context and the field work. In section 3 we describe the experimental framework and present the experimental results. Section 4 highlights the empirical results, while Section 5 concludes.

2. Context and field work

The experiments and the small household survey that accompanies them were conducted in five villages in Ivory Coast: three in the South/South-East, in the Abidjan area (Andokoi, Ashokoi and Bregbo) and two in the South-West, in the area of Soubré (Galea 2 and Logboayo). The approximate location of the two sets of villages is illustrated on Figure 1. Table 1 presents some interesting characteristics of each village.

<<<<<< INSERT FIGURE 1 ABOUT HERE>>>>>>

<<<<<INSERT TABLE 1 ABOUT HERE>>>>>>

As one can see, cocoa is the main income source in the villages in the South-West, while the villages in the South-East are mostly involved in rubber production. Men in most villages are mostly involved in the production of commercial crops, while women produce almost exclusively food crops. The range of food crops in the South-West and the South-East is slightly different. In the South-West the subsistence crops are rice, tomato, yam and cassava, while the main crops in the South-East are tomato and plantain. In so far as the organization of production is concerned, in Galea 2 in the South-West there is a cocoa cooperative, while in Bregbo in the South-East there is a cooperative producing high value crops, namely fish, poultry and pigs. One of the peculiarities of Andokoi is that there is a female cooperative involved in non-agricultural production. We also know that the main ethnic group in all villages is the Baoulé and immigrants from Burkina Faso represent the largest immigrant community. Two villages (Bregbo and Galea 2) are representative of CEDEAO (the community of West African States) in that they host immigrants from most West African countries. Another interesting difference is in governance. In the South-West villages, the chiefs are elected

democratically, while in the other three villages they are elected by the generational committee. In sum, the choice of villages guarantees representativity not only in terms of production, but also heterogeneity in the means of subsistence and in the local institutional structures.

3. Intra-household negotiations: presentation of the experiments

We propose a two-stage experiment which first assesses the propensity of partners to cooperate and then develops a measure of intra-household bargaining power. The first stage uses a version of a public goods game à la Munro, Kebede, Tarazona-Gomez and Berschoor (2011), where each partner decides individually how much of his/her endowment to contribute to a common pot. In the second stage we innovate by developing a game of allocation of the pot across family expenditures, by each partner separately and then by the couple playing as a team. The spouses participate in the public goods game and in the individual allocations in separate rooms. They are then reunited to allocate together the common pot. We use information from the different stages to develop the measure of bargaining power. The detailed instructions are presented in Appendix I.

First stage

During the first stage, the spouses are asked to remain in separate rooms (without possibility to communicate) in order to play the public goods games with their spouse as a counter party. The couples play the games three times, each time following a different rule. We vary the initial endowment, as well as the identity of the spouse who has the power to decide how to allocate the common pot. The sequence of the rounds is as follows:

- i. The subjects learn who (the wife or the husband) will decide how to allocate the common pot. The order is the same for all couples: the wife decides in the first round, the husband-in the second. They decide together in the third round.
- ii. An initial endowment is allocated simultaneously to each subject. Each partner knows that his/her spouse has received an amount between 1000 and 5000 CFA, but does not know the exact amount. This aims at avoiding the chance of conflict between the partners (Iversen et al, 2006). The initial endowment is 4000 CFA in the first and the third round and 5000 CFA in the second. We vary the endowment to avoid the chance of anchoring: a different endowment in each round will force the partners to reconsider the allocations in each round instead of simply repeating the choices of the previous round.
- iii. The subjects are asked to contribute to the common pot, knowing that each 1000 CFA unit will be multiplied by 1.5. They can choose unities of 0, 1, 2, 3, 4 and 5 thousand CFA as a function of their initial endowments. The spouses play simultaneously (in separate rooms); their decisions have consequences only in the second stage of the experiment.

As we shall see later, the variation of the rules has implications for the design of the bargaining power measure. The initial endowment, on the other hand, is presented as an individual payment to participate in the experiments, which allows us to avoid the cognitive bias effect of “free” money in the public goods game. The 1.5 multiplier captures the externality of cooperating.

The results from this first stage of the game allow us to verify the relevance of several postulates in the literature on intra household cooperation in the Ivoirian context. The results

on the contributions to the common pot are consistent with the rest of the literature (Iversen et al, 2006; Munri, 2018; Kebede, 2011). The average proportions allocated to the common pot are presented in Table 2. They allow us to test the hypothesis of surplus maximisation, according to which the average contribution of each partner should be equal to 1. As expected, in conformity with the literature, this hypothesis is rejected at the 1% significance level.

<<<<<< **Insert Table 2 about here**>>>>>>

Table 3 highlights the total amounts contributed by each spouse. As expected (see for instance Iversen et al, 2006), the altruism hypothesis, according to which the wife would contribute 4000 CFA (namely her total endowment) in the first round where she has control over the allocation of the pot, while the husband will contribute 5000 CFA (his total endowment) in the second round where he has control over the allocation of resources, is rejected at the 1% significance level.

As we vary the endowment between rounds 1 and 2, it is not a priori easy to distinguish the endowment effect from the effect of the control over the resource allocation. However, the fact that the proportions contributed by men and women do not change between the rounds (see Table 2), while the averages of the total amount contributed change in proportion with the change in the endowment (see Table 3) shows that the subjects have understood well the games and the endowment effect is stronger than the effect of the control over the allocations.

<<<<<< **Insert Table 3 about here**>>>>>>

Finally, Table 4 highlights the differences in the contributed amounts and the amounts expected by the partners. We observe that: (i) the contributed amounts are always greater than the expected amounts, (ii) women have a better capacity to predict the contributions of their spouses in that there is no significant difference between the sums contributed by the husbands and those expected by the wives in rounds 1 and 3. In fact, we observe better correspondence between the contributed and expected sums than that observed in similar contexts, for instance Ethiopia (Kebede et al, 2011).

<<<<<< **Insert Table 4 about here**>>>>>>

The public good games with varying rules produce the intermediate input for the calculation of the bargaining power measure that interests us the most. The sum of all contributions to the common pot, multiplied by 1.5 represents the total value of resources available to the partners for the allocations during the second stage of the experiment.

Second stage

The purpose of the second stage is to evaluate the revealed preferences of the spouses with respect to different categories of household expenditures. It allows us to calculate the bargaining power measure. The individuals play twice, once by themselves and a second time: with their partners. The sequence is as follows:

- i. The subjects first play the round where each has the responsibility of allocating the pot by him/herself. The experimenter asks them to allocate individually the total sum (accumulated in round 1 and round 2 of the first stage of the experiment, respectively) among 7 categories of expenditures (food, health, education of children, transfers to children living elsewhere, transfers to parents, house,

transport). These categories reflect the typical daily expenses of an average Ivoirian household. We observe that the most important ones are those on food, child education and transfers to parents. Hence, and given that these types of expenditures are at the core of most debates in the literature, we devote the essence of our empirical analysis to these three categories.

- ii. The spouses are united and asked to sit together in the same room. They receive the total value of the common pot assembled in the third round of the game and need to discuss and decide on the allocation of the common budget to the same categories of expenditures.

Table 5 highlights the proportions of the total pot, allocated to different categories of expenditures. These proportions are treated as an indicator of revealed preferences for these types of expenditures. We observe that the husband prioritises food expenditures, the wife prioritises the transfers to parents and there are no significant differences in the average contributions of the partners towards child education.

<<<<<<Insert Table 5 about here>>>>>>

The bargaining power of the husband/wife (for food expenditures, educational expenditures and transfers towards the parents, respectively) is calculated by using the difference between the common proportional allocation and the individual proportional allocations. The bargaining power of the wife is measured by the difference between her own proportional contribution and the common proportional contribution, while the bargaining power of the husband is measured by the difference between his own proportional contribution and the common proportional contribution. A high absolute value of these differences indicates low bargaining power as a value close to zero means that each partner has managed to achieve a common allocation as close as possible to his/her preferences. Based on these differences, we calculate the following indicator of female bargaining power:

The bargaining power of the woman $PNF_k = 1$ when $|H_k(I) - J_k| > |F_k(I) - J_k|$, where $H_k(I)$ et $F_k(I)$ are the individual allocations by the husband/wife respectively. J_k is the common allocation of the couple and PNF_k is the bargaining power of the woman. The formula is indexed by « k » for each type of expenditure. Effectively, when the common allocation is closer to the preferred allocation of the wife than the preferred allocation of the husband, the indicator takes the value of 1. It takes the value of 0 otherwise. Figure 2 shows the distribution of PNF_k . We see that the bargaining power of the woman is higher than that of the man in 43.65% of the cases of bargaining over food expenditures, 46.03% of the cases of bargaining over educational expenditures and 38.89% of the cases of bargaining over transfers to the parents.

<<<<<<<<Insert figure 2 about here>>>>>>>>

4. Survey and empirical results

The experiments and the small associated survey were conducted over a sample of 135 couples across 5 villages in Ivory Coast. Our objective was to select about 30 couples per village. In order not to complicate the analysis, we have excluded (without effect on the results) the polygamous couples. This left us with a sample of 129 couples. In each case the village chief gave us the list of all couples in the village that had at least one child together. From that list, we randomly selected between 25 and 30 couples (depending on the size of the village). All selected couples came to the designated place to participate in the experiments and the survey. Each spouse was also asked to complete a questionnaire, containing relevant information on the history and structure of the household, the education and the individual incomes of each spouse. The responses were fairly complete, the only problem being that in the case of two interesting variables, those on the wife's income and the bride price, there was a huge number of missing observations. The exclusion of these missing observations (in combination with missing observations among the rest of the variables of interest), leaves us with a sample of 99 observations. Given that in all the reported cases of bride price the values were positive, we assume that the non-reported values are effectively zeros. The situation is similar with female incomes, given that a large proportion of the women in our sample doesn't work outside of subsistence agriculture. As a consequence, we produce two type of regression results: (i) one set where missing observations of these two variables are replaced by zeros, and (ii) a second one using the reduced sample where missing observations are treated as missing. Unfortunately, our survey is not rich enough to explore more rigorously the possibility of selection bias.

We estimate the following regression:

$$[1] \quad PNF_j = \beta_0 + \beta_1 \text{Age of Wife}_j + \beta_2 \text{Age Difference}_j + \\ \beta_3 \text{Number Girls}_j + \beta_4 \text{Number Boys}_j + \sum_{i=1}^2 \beta_{5i} \text{Income}_{ij} + \\ \sum_{i=1}^2 \beta_{6i} \text{Education}_{ij} + \beta_7 \text{Bride Price}_j + \mu_v + \varepsilon_j$$

The dependent variable is the female bargaining power, as explained earlier. The variable is defined separately for the three different types of expenditures of interest: education, food, transfers to parents. The household is indexed by "j", while each spouse is indexed by "i".

The vector of explanatory variables includes individual variables like incomes of the husband/wife and their individual levels of education. These variables, in addition to the number of daughters/sons of the couple are among the most common explanatory variables of the women's bargaining power in the literature (see for instance Doss, 2013). Obviously, the income and the education of the woman, as well as the number of sons, are expected to be positively associated with the bargaining power of the woman, while the effect of daughters is expected to be negative. The effects of the husband's education and income are indeterminate. It is logical to assume that they should be positively associated with the bargaining power of the husband and thus negatively with that of the wife. However, recent research has shown that greater devotion of the husband to work outside of the household decreases his interest in

negotiations over household resource allocations (Pollak, 2005). In so far as the household level variables are concerned, the bride price is particularly interesting from a cultural point of view. Theoretically, higher bride price should increase the bargaining power of the wife. Under such assumption, much of the empirical literature has used the variable in its own right as a measure of female bargaining power (Quisumbing and Maluccio, 2000). At the same time, the specialised literature on the tradition of the bride price shows that the “sale” of the girl could have a negative effect on her autonomy (Corno, Hildebrandt and Voena, 2020; Platteau and Gaspart, 2007). A large proportion of this literature agrees on the fact that the effect of the bride price on women’s welfare is negative. A high bride price reduces the potential of the woman to return to her parents’ home, as well as her bargaining power over a number of household decisions (Fuseini and Doodoo, 2012; Kaye et al, 2005; Horne et al, 2013). However, Lowes and Nunn (2017) find the opposite effect in the case of RDC, while Hotte and Lambert (2020) find evidence in support of the more nuanced hypothesis, whereby the effect depends on whether the price was given to the girl or her family. In sum, the effect of the bride price could be positive or negative, depending on the context. The difference in the partners’ ages is also indeterminate. At the same time, the early marriage of girls, reduces (by definition) their autonomy and bargaining power (Corno, Hildebrandt and Voena, 2020). μ_v is the village fixed effect, while ε_j is the idiosyncratic error term.

<<<<<< Insert table 6 about here>>>>>>

Table 6 highlights some descriptive statistics for the sample as a whole, as well as by bargaining power categories. We observe that the average age of the husband is 43.93 years, while that of the wife is 36.984 years. The age difference between the partners is on average 7 years. The number of boys and girls is on average 2 with a maximum of 6 boys and 7 girls. The education of the husband is on average 2 times higher than that of the wife (3.344 years of education of the wife and 6.805 years of the husband). The difference in incomes is even more pronounced. Men earn on average 822 thousand CFA a year, or close to 3 times as much as the yearly earnings of 291 thousand of women’s incomes. On average, the bride price of the woman is approximately a sixth of the man’s annual income, but the maximum is close to the maximum annual income of the man. The variables for which we find statistically significant differences with respect to women’s bargaining power are the education of the woman (and in the case of bargaining over education: the education of the man), the income of the man, the age of the woman; and in the case of bargaining over transfers to the parents: the bride price.

<<<<<< Insert table 7 about here>>>>>>

Table 7 presents the results from a linear probability model estimation of equation [1]. The first six columns highlight the results where the missing observations of the income of the woman and the bride price are replaced with zeros, while the last six present the results with the missing observations. The narrative is coherent across the two samples, which confirms our assumption that the missing observations are effectively zeros.

The most robust result is the positive correlation of years of education of the woman and her bargaining power over educational and food expenditures. What is also interesting is that the income of the husband increases the bargaining power of the woman over food and educational expenditures. This is consistent with the proposition that greater amount of time devoted by the man to work outside the household gives more control of the woman over household decisions (Pollak, 2005). This possibility is confirmed by the positive village effect of Ashokoi

and Bregbo (characterised by rubber production, which is very remunerative and dominated by men) vis-à-vis the omitted category of Andokoi- a poor village in the South-West of the country.

The bride price reduces the bargaining power of the woman over transfers to the parents. This result is consistent with more recent case studies (Fuseini and Dodoo, 2012; Kaye et al, 2005; Horne et al, 2013), and generally with literature seeing the effect of the bride price as more negative than positive (see for instance the debate between Platteau and Gaspart, 2007 and Lowes and Nunn, 2017).

The only difference in our results across the two samples is the fact that in the case when the missing observations are not replaced by zeros, we see a negative and statistically significant link between the age difference of the partners and the bargaining power of the woman over food expenditures, as well as between the number of daughters and the bargaining power of the wife over transfers to the parents, and between the bride price and the bargaining power of the woman over education expenditures. In the case when the missing observations are replaced by zeros the signs of the corresponding coefficients are the same, but the variables are not statistically significant. In sum, the stories associated with the two samples are consistent, which gives support to our hypothesis that the missing observations in the female revenues and the bride price variables are effectively zeros.

5. Conclusion

The household welfare implications of women's bargaining power have traditionally been among the most prolific themes of the economics literature. While early studies have generally supported the hypothesis that the bargaining power of the woman is positively associated with types of expenditures that improve the welfare of the household, especially that of children, more recent research has challenged this hypothesis. Moreover, while the literature relying on standard household surveys have typically used proxies of bargaining power, the experimental literature has attempted to resolve some problems of this approach by observing (instead of proxying or estimating empirically) the revealed preferences of partners in their process of negotiation over family resource allocation.

This article starts by proposing a novel experimental method, which positions the estimation of the revealed preferences of partners and their relative bargaining power over different types of family expenditures in the context of public good games. The main idea is to imitate as much as possible the decision making in the household, while observing the revealed preferences of the partners and developing a bargaining power measure over educational and food expenditures and transfers to the parents. Next, we explore the correlation of these measures of bargaining power with possible determinants in rural Ivory Coast.

While the husband reveals preferences for food expenditures superior of those of the wife, the wife exhibits superior revealed preferences towards transfers to the parents. The revealed preferences of the partners with respect to educational expenditures are similar. In other words, while the husband gives priority to (nuclear) family expenditures, the wife appears to give more priority to her origin family. At first sight, these results contradict the essential postulates of the early research in this area and are easy to explain in a West African patriarchal society where the husband is the main bread winner. In this sense, it is interesting to see that the bride price is negatively associated with the bargaining power of the wife over transfers to the

parents, in conformity with the literature that finds a negative association between the bride price and the welfare of the woman (Platteau and Gaspart, 2007). However, the results also echo findings of anthropological studies, which suggest that women use investments in their social networks as security investments (see for instance Guyer, 2004). These networks could benefit the nuclear family in both the short and long run. In this sense, one can think of both direct and indirect investments in children.

As expected, the education level of the woman increases her bargaining power with respect to educational and food expenditure. What is also interesting is that the income of the husband is positively associated with the bargaining power of the wife over food and child education. One plausible explanation is that the greater number of work hours of the husband outside the house gives more control to the wife over household decisions (Pollak, 2006). The full set of results over the revealed preferences of partners and the bargaining power of the woman make us aware of the fact that the cultural context needs to be taken seriously into account in the development of economic policies and a combination of experimental and empirical research would help us better understand this important input into policy making.

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Figure 1: Studied areas



Table 1: Village characteristics

Villages	Main crops	Secondary crops	Cooperatives
Villages in the region of Soubré			
GALEA 2	Cocoa	Rice, tomato, sweet potato, cassava	Cocoa cooperative
LOGBOAYO	Cocoa	Rice, tomato, sweet potato, cassava	No
Villages in the region of Abidjan			
ANDOKOI		Tomato, sweet potato, plantain	Non-agricultural cooperative
ASHOKOI	Rubber	Tomato, sweet potato, plantain	Non
BREGBO	Rubber	Tomato, sweet potato, plantain	Fish, poultry and pigs cooperative

Table 2 : Proportions allocated to the common pot

H0: prop allocated=1				
Variable	Mean	Standard deviation	t-stat	p-val
Prop allocated R1 woman	.719	.315		
Prop allocated R1 man	.649	.286		
Prop allocated R1	.684	.201	-17.9709	0.000
Prop allocated R2 woman	.713	.273		
Prop allocated R2 man	.661	.287		
Prop allocated R2	.687	.178	-20.1026	0.000
Prop allocated R3 woman	.76	.276		
Prop allocated R3 man	.662	.31		
Prop allocated R3	.711	.192	-17.1943	0.000
H0: Prop allocated R1 woman= Prop allocated R2 woman, t-stat= 0.2928, p-val= 0.3851				
H0: Prop allocated R1 man= Prop allocated R2 man, t-stat= -0.6741, p-val= 0.7493				

Table 3 : Total amounts allocated to the common pot

Variable	Woman		Man		t-test	p-val
	Mean	Standard deviation	Mean	Standard deviation		
Total amount allocated R1	2.878	1.259	2.595	1.142		
H0: Woman=4000					-10.2017	0.0000
Total amount allocated R2	3.565	1.365	3.305	1.435		
H0: Man=5000					-13.5143	0.0000
Total amount allocated R3	3.038	1.105	2.649	1.240		

Tableau 4 : Allocated versus expected contributions

H0: Contributed sum=Expected sum						
Variable	Woman			Man		
	Mean	Standard deviation	t-stat (p-val)	Mean	Standard deviation	t-stat (p-val)
Contributed sum R1	2.878	1.259	3.3463	2.595	1.142	1.0846
Expected sum R1	2.405	1.435	(0.000)	2.511	1.236	(0.1401)
Contributed sum R2	3.565	1.365	2.5221	3.305	1.435	3.9969
Expected sum R2	3.145	1.785	(0.000)	2.885	1.557	(0.000)
Contributed sum R3	3.038	1.105	2.4336	2.649	1.240	0.7580
Expected sum R3	2.679	1.485	(0.000)	2.595	1.195	(0.2249)

Tableau 5 : Revealed preferences (individual and collective) for various types of expenditures

Variable	Woman		Man		Together		Test: pr woman= pr man	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	t-stat	p-val
Proportion-food	.201	.097	.240	.136	.226	.090	-2.5214	0.0065
Proportion-education	.170	.097	.169	.091	.167	.078	-0.0183	0.5073
Proportion-parents	.113	.099	.070	.064	.09	.057	4.3594	0.0000

Figure 2: Bargaining power

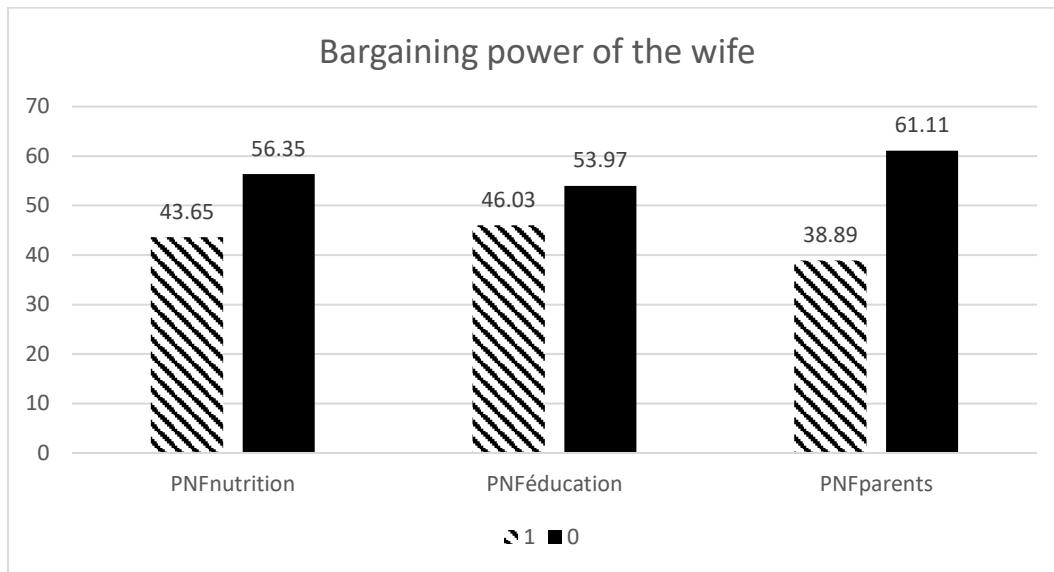


Table 6 : Descriptive statistics

Full sample			By category of bargaining power					
Variable	Obs	Mean	PNFnour=1	PNFnour=0	PNFedu=1	PNFedu=0	PNFpar=1	PNFpar=0
Age wife	128	36.984 (8.586)	38.093 (8.908)	35.986 (8.343)	36.862 (8.954)	36.925 (8.388)	35.833 (7.883)	37.558 (9.0371)
Age husband	128	43.93 (9.788)	44.537 (9.162)	43.056 (10.246)	44.293 (10.090)	43.179 (9.553)	42.625 (9.120)	44.364 (10.174)
Age difference	128	6.945 (5.62)	6.444 (6.275)	7.07 (4.850)	7.431 (5.099)	6.254 (5.800)	6.792 (4.846)	6.805 (5.896)
N daughters	129	2.38 (1.562)	2.491 (1.399)	2.268 (1.672)	2.379 (1.508)	2.353 (1.609)	2.061 (1.586)	2.558 (1.517)
N sons	129	2.155 (1.487)	2.091 (1.613)	2.099 (1.300)	2.103 (1.410)	2.088 (1.473)	2.224 (1.327)	2.013 (1.508)
Education husband	128	6.805 (4.782)	6.87 (4.833)	6.873 (4.699)	7.448 (4.565)	6.373 (4.861)	6.604 (5.237)	7.039 (4.426)
Education wife	125	3.344 (4.112)	4.358 (4.407)	2.71 (3.777)	4.491 (4.408)	2.492 (3.649)	3.787 (4.534)	3.2 (3.865)
Wife's income	115	291.583 (590.215)	316.459 (589.422)	269.929 (608.633)	228.473 (424.106)	349.93 (726.747)	372.857 (821.949)	240.743 (409.044)
Husband's income	128	822.555 (1656.927)	1052.278 (2476.402)	638.648 (487.470)	998.983 (2396.727)	660.09 (491.0147)	960.354 (2267.665)	728.182 (1167.688)
Bride price	116	128.137 (100.074)	127.723 (93.4380)	127.874 (104.439)	116.852 (95.01905)	137.842 (103.3627)	110.865 (81.580)	137.097 (107.578)

The figures in brackets are standard deviations. The significant differences are highlighted in bold.

Table 7 : Empirical results

VARIABLES	(1) Nutrition	(2) Nutrition	(3) Education	(4) Education	(5) Parents	(6) Parents	(1) Nutrition	(2) Nutrition	(3) Education	(4) Education	(5) Parents	(6) Parents
Age wife	0.00383 (0.00611)	0.00490 (0.00609)	-0.00517 (0.00605)	-0.00319 (0.00597)	-0.0101 (0.00613)	-0.00946 (0.00646)	0.000528 (0.00650)	0.000551 (0.00640)	-0.00523 (0.00680)	-0.00401 (0.00696)	-0.00834 (0.00693)	-0.00834 (0.00693)
Age difference	-0.00734 (0.0107)	-0.00560 (0.0108)	0.00726 (0.00878)	0.0120 (0.00945)	-0.00152 (0.00899)	-0.00226 (0.00918)	-0.0192* (0.00971)	-0.0181* (0.00990)	0.0146 (0.0104)	0.0170 (0.0114)	-0.000512 (0.00983)	0.000512 (0.00983)
N daughters	0.0294 (0.0358)	0.0181 (0.0357)	0.0106 (0.0348)	0.0203 (0.0320)	-0.0253 (0.0341)	-0.0286 (0.0360)	0.0482 (0.0389)	0.0410 (0.0397)	-0.00782 (0.0394)	0.00297 (0.0380)	-0.0591* (0.0355)	-0.0591* (0.0355)
N sons	0.00783 (0.0439)	0.0148 (0.0460)	0.0520 (0.0395)	0.0591 (0.0376)	0.0600 (0.0409)	0.0631 (0.0415)	0.0160 (0.0477)	0.0190 (0.0490)	0.0603 (0.0439)	0.0650 (0.0443)	0.0383 (0.0449)	0.0383 (0.0449)
Education husband	-0.00887 (0.0117)	-0.00742 (0.0118)	0.00473 (0.0107)	-0.00206 (0.00963)	-0.00930 (0.0114)	-0.00757 (0.0119)	-0.00815 (0.0119)	-0.00941 (0.0123)	0.00207 (0.0131)	-0.00445 (0.0123)	-0.0149 (0.0132)	-0.0149 (0.0132)
Education wife	0.0296** (0.0130)	0.0299** (0.0137)	0.0337*** (0.0121)	0.0213* (0.0126)	0.0203 (0.0125)	0.0212 (0.0141)	0.0403*** (0.0136)	0.0376** (0.0148)	0.0366*** (0.0128)	0.0233* (0.0139)	0.0256* (0.0133)	0.0256* (0.0133)
Income wife	0.0438 (0.0795)	0.0177 (0.0657)	-0.0664 (0.0473)	-0.0508 (0.0442)	0.0437 (0.0572)	0.0290 (0.0624)	0.126 (0.0952)	0.102 (0.0975)	-0.0963 (0.0850)	-0.0730 (0.0820)	0.0505 (0.0953)	0.0505 (0.0953)
Income husband	0.0329*** (0.0116)	0.0361*** (0.0122)	0.0260* (0.0144)	0.0337** (0.0150)	0.0153 (0.0185)	0.0219 (0.0198)	0.0465*** (0.00878)	0.0410*** (0.0117)	0.0201 (0.0142)	0.0299* (0.0159)	0.0240 (0.0165)	0.0240 (0.0165)
Bride price	-0.000184 (0.000448)	7.92e-05 (0.000487)	-0.000501 (0.000472)	-0.000473 (0.000482)	-0.00101*** (0.000379)	-0.00104** (0.000435)	0.000111 (0.000567)	0.000523 (0.000600)	-0.000947* (0.000527)	-0.00102* (0.000554)	-0.00108** (0.000420)	-0.00108** (0.000420)
Ashokoi		0.174 (0.140)		0.516*** (0.131)		0.0458 (0.142)		0.0724 (0.158)		0.408** (0.160)		0.408** (0.160)
Bregbo		0.358** (0.147)		0.253* (0.150)		0.0971 (0.156)		0.192 (0.182)		0.150 (0.189)		0.150 (0.189)
Galea 2		0.191 (0.149)		0.0464 (0.144)		0.128 (0.147)		-0.0660 (0.165)		-0.00834 (0.175)		-0.00834 (0.175)
Logboayo		0.221 (0.161)		0.160 (0.165)		0.00194 (0.160)		0.177 (0.176)		0.0247 (0.190)		0.0247 (0.190)
Constant	0.200 (0.243)	-0.0615 (0.263)	0.381 (0.235)	0.108 (0.274)	0.789*** (0.230)	0.702** (0.274)	0.211 (0.272)	0.113 (0.303)	0.483* (0.260)	0.328 (0.330)	0.821*** (0.258)	0.821*** (0.258)
Observations	122	122	122	122	122	122	99	99	99	99	99	99
R-squared	0.086	0.133	0.108	0.227	0.104	0.113	0.175	0.202	0.150	0.238	0.134	0.150

Standard errors in parentheses

ANNEXE I :

A : INSTRUCTIONS

Stage 1 : Public goods games (3 rounds)

In this activity, the husbands take decisions on one side, wives- on the other

Each of you have gained between 1000 and 5000 CFA for participation in today's activities. You can see this sum in the wallet drawn on your sheet (point 1)

Your spouse has also earned between 1000 and 5000 CFA.

This activity will allow you to:

- Decide whether you would like to put some of the money you have in the common pot with your spouse for common family expenditures (food, education of children, transfers to parents, etc) and how much.
- If you do not put anything, you keep the money for your personal expenditures.

Your spouse has to make the same choice.

The sum that you and your spouse puts in the common pot increases : if you put 1000 CFA, this becomes 1500 CFA. If you keep 1000 CFA for yourselves, this remains 1000 CFA.

Before starting the game, we shall announce a rule that determines who decides how to use the money in the common pot (you, your spouse or together).

Each of you will play in three rounds, with a different rule in each round.

At the end of this activity, we shall choose randomly one of the three rounds and will give you an envelope with the money that you have decided to keep for yourselves. We shall do the same with your spouse. We shall give to the person who decides in that round the envelope with the common expenditures.

For example : I have in my wallet (1), 4 banknotes of 1000 CFA hence ? 4000 CFA

(2) I want to put 2 banknotes in the common pot. I cross 2 notes See how much this becomes : 3500 CFA.

(3) If my spouse has received 5000 CFA, I think that he will put 3 banknotes in the common pot. I cross 3 banknotes.

Another example : (1) 2 banknotes (2) 0 banknotes (3) 1 banknote

Questions? If you have any, please raise your hands and we shall come to you to explain.

In the first round, The wife decides what to do with the common pot.

In the wallet (point 1), there are between 1 and 5 banknotes of 1 000 CFA.

Question to all : ? 1000 et 5000 francs

This total sum is written on the wallet.

From this sum (1 000, 2000, 3000, 4000 or 5000 Francs), you need to decide how much to put in the common pot (**2**). Cross the number of banknotes of 1000 CFA that you would like to contribute (0 1 2 3 4 or 5)

Now, imagine that your spouse has received 5000 CFA. Cross the number of banknotes of 1000 CFA that you think your spouse has put down in the common pot (0 1 2 3 4 or 5)

Has everyone finished with this sheet ?

For the second round, The husband decides on the allocation of the common pot.

Same questions.

Has everyone completed the sheet ?

For the third round, You decide, in discussion with your spouse, what to do with the common pot.

Same questions.

Has everyone finished. ?

OK, we shall now collect the sheets, take 10 minutes of break and then join the others. Then you will have to take a decision of how to spend the money.

After 10 minutes

Stage 2 : Individual allocation of the common pot

You have a piece of paper in front of you.

The total sum of money that you and your spouse have contributed is written there. You need to decide how you would like to spend the money. You have a choice among many options (read).

Choose 1, 2 or 3, or 4 of these options and write down how much money you would like to spend on these chosen categories.

Be careful ! You cannot spend more than the sum written down.

For example : if there is 8000 CFA in the common pot, you cannot spend 5000 on one option and 4000 on the other. Why ? Because $9000 > 8000$. Make sure that everyone has understood.

First round / Second round : It is **YOU** who decides how to allocate the money.

There are CFA in the common pot.

For what do you want to spend the money ?

		How much (CFA)?
1	Food	
2	Health	
3	Education	
4	Transfers to children	
5	Transfers to parents	
6	House	
7	Transport	

Has everyone finished ? We shall now collect the sheets.

Now the spouses are reunited.

In front of you is a new sheet with the total sum of the common pot.

You have 5 minutes to decide together what you want to spend the money for and how much. Write it down.

B : RESPONSE SHEETS FOR THE INDIVIDUALS

Note : These response sheets represent the instructions given to the wives. The response sheets to the husbands are the same, except that the allocation rules are inverse during the first two rounds of the public goods games.

Stage 1 : Public goods game (3 rounds)

1st round : It is you who decides on the allocation of the common pot






1) You have



2) In the common pot :






You allocate :

This results in :

- | | | |
|----------------------------|-------------------------------------------------------------------------------------|-----------|
| <input type="checkbox"/> 0 |  | 0 |
| <input type="checkbox"/> 1 |  | CFA 1,500 |
| <input type="checkbox"/> 2 |  | CFA 3,000 |
| <input type="checkbox"/> 3 |  | CFA 4,500 |
| <input type="checkbox"/> 4 |  | CFA 6,000 |

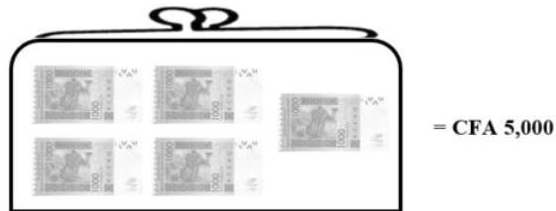
3) Imagine that your spouse had 4000 CFA.

You think he put in the common pot :

- | | | |
|----------------------------|-------------------------------------------------------------------------------------|-----------|
| <input type="checkbox"/> 0 |  | 0 |
| <input type="checkbox"/> 1 |  | CFA 1,500 |
| <input type="checkbox"/> 2 |  | CFA 3,000 |
| <input type="checkbox"/> 3 |  | CFA 4,500 |
| <input type="checkbox"/> 4 |  | CFA 6,000 |

2 round : It is YOUR SPOUSE who decides how to allocate the common pot.






1) You have



2) In the common pot :






You allocate :

This results in :

- | | | |
|----------------------------|-------------------------------------------------------------------------------------|-----------|
| <input type="checkbox"/> 0 |  | 0 |
| <input type="checkbox"/> 1 |  | CFA 1,500 |
| <input type="checkbox"/> 2 |  | CFA 3,000 |
| <input type="checkbox"/> 3 |  | CFA 4,500 |
| <input type="checkbox"/> 4 |  | CFA 6,000 |

3) Imagine that your spouse has 5000 CFA.

You think he put in the common pot :

- | | | |
|----------------------------|-------------------------------------------------------------------------------------|-----------|
| <input type="checkbox"/> 0 |  | 0 |
| <input type="checkbox"/> 1 |  | CFA 1,500 |
| <input type="checkbox"/> 2 |  | CFA 3,000 |
| <input type="checkbox"/> 3 |  | CFA 4,500 |
| <input type="checkbox"/> 4 |  | CFA 6,000 |

3 round : you decide together how to allocate the common pot.

1) You have.



2) In the common pot :

You allocate :

0 

1 

2 

3 

4 

This results in :

0

CFA 1,500

CFA 3,000

CFA 4,500

CFA 6,000

3) Imagine your spouse has.

You think he will contribute :

0 

1 

2 

3 

4 

0

CFA 1,500

CFA 3,000

CFA 4,500

CFA 6,000

Stage 2 : Individual allocation

(1st round), It is YOU who decides who to allocate the money :

There is CFA in the common pot. How do you want to allocate the money across the following categories? :

		How much (CFA)?
1	Food	
2	Health	
3	Education	
4	Transfers to children	
5	Transfers to parents	
6	House	
7	Transport	

