ASK ME WHY: PATTERNS OF INTRAHOUSEHOLD DECISION-MAKING

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ABSTRACT

While the question of who makes key production and consumption decisions within households has become an important indicator of women's empowerment and intrahousehold bargaining, few studies examine these decision-making processes. In this paper, we add a second dimension to these analyses, investigating respondents' perceptions of why the decision was made by a particular person. Using vignettes, we describe five households in which we vary the reasons why one person (or the couple together) make the decisions. We then ask respondents to indicate how similar they are to each type of household. After demonstrating the reliability and concurrent validity of these measures, we find substantial heterogeneity in terms of which household respondents resemble, even among those reporting that men make the decisions. We then analyze how the identity of the decision-maker (husband or wife alone, or the couple together) and reasons for decision-making is related to both production and consumption outcomes. Using data from dairy farmers in rural Senegal, we find that understanding both who makes production and consumption decisions as well as why this person (or the couple) is the one who decides provides more insights than simply considering who makes the decision. Households achieve greater milk production, higher hemoglobin levels among children, and more satisfaction with decisions when the most informed member or members of the household make the relevant decision. This suggests that programs providing information should target both husbands and wives.

Key words: Decision-making; Intrahousehold bargaining; Women's empowerment;

Measurement; Senegal; Agricultural production; Child health

1. INTRODUCTION

Households are sites of both cooperation and contestation. With more data available at the intrahousehold level, development researchers and practitioners have increasingly focused on household dynamics and the measurement of bargaining power within the household. Substantial evidence suggests that the bargaining power of individual household members can affect outcomes experienced by households and the individuals within them (Doss, 2013). Moreover, research suggests that although bargaining power is not directly observed, it can be inferred from individual characteristics and the relationships of household members within families, communities, and social networks.

One widely used measure of individuals' bargaining power is the extent to which they are involved in household decision-making. This approach implicitly assumes that individuals who make more decisions over household production and consumption issues are more empowered and have more agency. Decision-making is therefore seen as evidence of bargaining power, but this premise may be flawed. In some circumstances, individuals with more bargaining power or higher status may prefer to leave the decision-making process to others. A woman who makes decisions over what food to cook does not necessarily have higher bargaining power than her husband who assumes, without being involved in planning or preparing the meal, that the prepared food will cater to his tastes and preferences. Similarly, women with more bargaining power might choose not to be involved in agricultural decisions, preferring to focus on running a non-agricultural enterprise.

Our objective is to refine the existing measurement tools of intrahousehold dynamics in a way that can further inform development research and policy design. In this paper, we use an innovative methodology to look beyond the identity of the decision-maker to explore the reasons

that may drive patterns of household decision-making. We then assess whether the process/reason that drives patterns of household decision-making is more relevant for some outcomes than relying solely on the identity of the decision-maker. Our approach uses vignettes, which are survey instruments used to measure concepts that are more easily defined by examples.[2] Vignettes have been used to measure subjective well-being (Ravallion, Himelein, & Beegle, 2016), women's agency (see Donald, Koolwal, Annan, Falb, & Goldstein, 2017 for a review), bias against women politicians (Beaman et al., 2009), as well as risk aversion (Barter & Renold, 1999). However, this is the first time that they have been used to analyze the processes of household decision-making.

We develop a typology of households, based on their decision-making processes. We employ five vignettes, respectively illustrating: the "dictator" model wherein the same individual makes all significant decisions in the household; the "contribution" model wherein each decision type is made by the person who contributes the most resources used for this activity; the "separate sphere" model wherein individuals within the household are in charge of separate types of decisions; the "norms" model wherein one is entitled to take a particular decisions because of local social norms; and the "most informed" model wherein each decision type is taken by the individual that is the most qualified to do so. Using a set of vignettes which present these distinct types of couples and their decision-making approaches, we ask respondents in rural Senegal which household they most closely resemble.

In addition, we extend beyond a single domain, analyzing both a consumption and a production decision. We focus on milk which is a central component of households' income and diet in our study area. Specifically, the decisions relate to the allocation of food inputs among lactating cows (production decision) and the spending of money obtained from milk sales

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[2] See (Benini, 2018), (King, Murray, Salomon, & Tandon, 2004), and Gary King's website for discussions and examples: https://gking.harvard.edu/vign.

(consumption decision). For each, we collected information on the identity of the decision-maker (husband, wife, both, other), the household type that most resembles the household (dictator, contribution, separate sphere, norms, or most informed), as well as outcome measures. These include the respondent's assessment of whether the decision taken was in the interest of the household as well as objective measures of milk produced per cow (for production decisions) and child hemoglobin levels (for consumption decisions). For each interviewed household, enumerators asked the same questions to the husband and his wife(s) separately.

These data allow us to perform a series of tests regarding the capacity of these vignettes to reliably assess 'why' certain individuals are responsible for specific decisions. We exploit random variations in the ordering of questions to investigate anchoring issues and assess respondent-reliability by analyzing within household differences in answers to the same questions. We find no evidence of large anchoring effects or systematic gender biases in answering these questions – as opposed to questions regarding 'who decides,' where these biases are more evident.

We next assess the concurrent validity of the vignettes instrument.[3] Our results first suggest an imperfect correlation between the identity of the decision-maker (husband, wife, or both) and the type of household with which they identify. While men making decisions related to consumption or production are generally associated with a *dictator* type of household, they are also often associated with the *most-informed* model. Women making decisions are less often associated with the *dictator* model, and more often with the *most informed* or the *separate spheres* ones. Thus, while households may resemble one another regarding 'who' decides on a particular issue, they may differ as to 'why' this may be the case.

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[3] In contrast to "predictive" validity, which refers to a test or score than can predict future outcomes, "concurrent" validity reflects the extent to which our vignettes effectively predict other contemporaneously-measured outcomes of interest that have been previously validated.

Last, we investigate whether vignettes help explain differences in outcomes across households and individuals within them, beyond the mere reliance on 'who' is the decision-maker. Although the identity of the decisionmaker—whether it is the husband, wife, or couple—does not affect most outcomes, households in which the *most informed* individual or couple make decisions tend to have better production and consumption outcomes. Our results also point to several instances where it is not simply the 'who decides' or 'why', but the combination of both that matters. Regardless of who decides, households in which the individual or couple make decisions due to *community norms* tend to have worse outcomes than *most informed* households. When wives contribute to decisions, respondents identifying with the *contribution* and *dictator* typologies experience outcomes that are, on average, inferior to those in which the most informed member makes the decision.

Our main contribution to the literature is to go beyond simply identifying who makes the decisions or identifying whether the sample of households demonstrates a pattern of cooperative or noncooperative outcomes. Instead, we seek to understand the reasons why particular individuals are involved in making decisions and relate this to outcomes. By considering both a production and consumption decision, we are able to demonstrate that the patterns vary across domains. Since the vast majority of the existing literature on intrahousehold bargaining issues focuses on women's role, we frame most of our analysis in this perspective. The method and instrument that we propose can however be extended to other individuals within the household.

The rest of the paper is organized as follows. Section 2 reviews the literature; Section 3 presents the household typologies used in the vignettes; Section 4 presents the context, data, and implementation of the vignettes; Section 5 assesses the reliability of the vignettes; Section 6

assesses the concurrent validity of the household typologies by estimating its associations with production and consumption outcomes; and Section 7 concludes.

2. INTRAHOUSEHOLD DECISION-MAKING: A LITERATURE REVIEW

The study of intrahousehold decision-making relates to two distinct strands of the literature: one that concentrates on intrahousehold bargaining issues and another that focuses on women's empowerment and agency. The conceptual links between these are however less clear than the literature implicitly assumes.

An early strand of the economics literature focused on challenging the unitary model of the household, in which the household acts as though it is a single decision-maker and pools all resources. This literature demonstrates, for example, that who earns the income or owns the assets affects the outcomes of household decisions.[4] The collective models of the household (Browning & Chiappori, 1998), of which the Nash bargaining models are a subset, assume that households reach Pareto efficient outcomes and they derive weights from the data to identify individual-level factors that affect these outcomes (McElroy & Horney, 1981; Manser & Brown, 1980). None of these models directly consider the processes of household decision-making, but the empirical evidence is convincing that individual-level factors do influence outcomes across a range of settings (Cheryl Doss, 2013).

The noncooperative bargaining models, such as the separate spheres model (Lundberg & Pollak, 1993), do not assume Pareto Efficiency and instead test for it. A number of studies do not find efficient outcomes in field data (Udry, 1996; Dercon & Krishnan, 2000; Djebbari, 2005; J.G. McPeak & Doss, 2006; Duflo and Udry, 2004; Angelucci and Garlick, 2016; Hoel et al. 2018), or laboratory games (Munro, 2018 reviews the literature). Given that household members are

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[4] Both (C. R. Doss, 1996; Strauss, Mwabu, & Beegle, 2000) review the early evidence on this.

presumed to be playing a repeated game with one another, it is a bit of a puzzle that they are not able to reach efficient outcomes. These analyses do not tell us why; only that potential gains within the household exist.

There is no direct link between obtaining cooperative or efficient outcomes and women's role in decision-making. A major challenge within the empirical literature is that bargaining power cannot be directly measured. Instead, researchers use a range of proxies. These include individuals' roles in decision-making, potential income, assets, assets brought to marriage, legal frameworks, education, and other measures of financial, economic, and legal power (Doss, 2013). The decision-making indicators are constructed from survey questions such as "who decides," "who has the final say," or "who makes most of the decisions" for a particular range of domains. These may be used individually or aggregated into an index of individuals' decision-making.

Using individuals' role in household decision-making as a proxy for bargaining power may be misleading for several reasons. First, they conflate the process of decision-making with the influence on the outcome of the decision (Donald et al., 2017). For instance, it is plausible that under some circumstances a person with more bargaining power would choose not to be involved in the decision-making process, particularly if the final outcome is consistent with his or her preferences.

Second, proxy measures typically equate independent decision-making with empowerment and agency. A common practice is then to code responses to questions about decision-making according to a linear ranking. In a normative sense, the highest level of female empowerment is usually thought to be the case in which a woman makes decisions alone. This is followed by a woman making decisions with her spouse (second best) and a woman not involved in decision-making (worst). But it is not obvious that this ranking is sensible (Peterman et al., 2015; Seymour

& Peterman, 2018). Husbands and wives may prefer to make decisions jointly. Some women who make decisions independently do so only because their husband is unable or unwilling to be involved; in these cases, the women shoulder heavy responsibility for the family. In a study of female-headed households among pastoralists on the Kenya/Ethiopia border, many respondents said that one of the disadvantages of being a single head of household is that they had no one with whom to share decision-making (J. McPeak, Little, & Doss, 2012). Thus, simply looking at the identity of the decision-maker may not provide the information that we expect.

A third concern is that many analyses that use women's role in decision-making only consider responses from women. Evidence suggests that men and women may provide different responses to questions about women's roles and that spousal agreement is important for improved outcomes (Ambler et al., 2017; Donald et al., 2017). In this paper, we do not explicitly compare the responses of husbands and wives, but we include both sets of responses in our analysis.

Finally, households make myriad decisions and the patterns of decision-making may vary across domains. This is particularly challenging for our understanding of rural agricultural households which make multiple and layered production and consumption decisions. Despite a long-standing literature on non-separability of household's production and consumption decisions in poor rural areas,[5] the economics literature on household decision-making has typically considered decision-making within one sphere and often only considered one or a few related outcomes. Analyses focusing on whether households obtain cooperative outcomes have typically analyzed consumption (Bobonis, 2008; Bourgignon et al., 1993; Browning et al., 1994; Thomas & Chen, 2994) or production (Akresh, 2005; Chiappori, Fortin, & Lacroix, 2002) decisions, but generally have not assessed both domains for the same households. To the best of our knowledge,

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[5] E.g.(Janvry & Sadoulet, 2006) for a review.

only one study assesses the Pareto efficiency of both consumption and production, finding that, while farming households in Burkina Faso, Senegal, and Ghana may not achieve productive efficiency, they cannot reject the hypothesis that these households achieve an efficient allocation of resources towards consumption (Rangel and Thomas, 2005). Most of these papers also do not allow for heterogeneity in efficiency across households, although the few studies that consider this find that cooperative or efficient outcomes vary across households (Angelucci & Garlick, 2016; Hoel, 2015; Hoel, Hidrobo, Bernard, & Ashour, 2018)

In this paper, we contribute to the literature by going beyond simply identifying who makes the decisions or identifying the patterns of cooperation or noncooperation across a sample of households. Instead, we seek to understand the reasons why particular individuals are involved in making decisions and relate this to outcomes. By considering both a production and consumption decision, we are able to demonstrate that the patterns vary across domains.

3. WHO DECIDES: A HOUSEHOLD TYPOLOGY

Drawing on the extensive literature on household decision-making, we identify five types of households based on five potential ways of understanding 'why' one makes the decisions within the household. These five categories are not necessarily exclusive, but each has a different key element.

The first household type is one in which one person (or possibly the couple together) makes all decisions. We refer to this as the "dictator" model. The dictator model stems from a unitary household model where resources are pooled and a utility function is maximized through the preferences of a dominant family member (Chiappori et al., 1993). The dictator may be a benevolent altruist (Becker, 1981), making decisions that are in the best interests of the household overall, or may be a selfish one, prioritizing his or her individual preferences. Patriarchal gender

norms across many contexts could result in the male head of household acting as the dictator for household decisions.

We characterize the second household type as the "contributions" model, one where decision-making is based on individual contributions, whether in terms of resources (such as land), income, or labor. Sen asserts that each household member's contribution to output can legitimize "a correspondingly bigger share of the fruits of cooperation" (Sen, 1987, p. 136). Sen (1987) also highlights the importance of *perceived* contributions, noting that reproductive work, which women often undertake, is frequently and unjustly classified as *contributing* less to output than men's work, which helps legitimize men's larger role in decision making and inequalities in consumption. While economists may worry that individual level income is endogenous to other household decisions, in this case we are interested in the source of decision-making authority. Farmer and Tiefenthaler (1995) also apply a variety of concepts of fairness, including the contribution rule, to the problem of how resources are distributed within households.

A third household type can be characterized as the "separate spheres" model where individuals each have separate domains in which they make the decisions (Carter & Katz, 1997; Lundberg & Pollak, 1993). Specialization in certain domains reduces the need for complex coordination, and often, the domains are based on gender norms, with women being responsible for things such as housekeeping and childcare and men being responsible for marketing livestock and crops.

A fourth type of household decision-making is one in which the person who decides is determined by community norms, rather than the individual preferences or bargaining power of the individuals in the household. We refer to this as the "norms" model. Duflo and Udry (2004)

find evidence that households in Côte d'Ivoire exhibit expenditure patterns that match descriptions of the norms of household provision in that setting, but contradict the collective household model.

Finally, in the last type of household, decision-making authority is based on information or knowledge. The decision-maker is described as the one who is most informed about that particular domain. We refer to this as the "most informed" model.

Clearly, these categories may overlap. The husband, for instance, may make decisions about managing the cattle because he owns them, livestock production is his domain, and he is the most knowledgeable about raising cattle. Moreover, community norms may influence other household types. For example, if norms dictate that young boys care for cattle while young girls conduct household chores, this may eventually result in the *separate spheres* or *most informed* models due to acquired competencies. Our claim here is simply that understanding the source of decision-making authority reported by the respondent, that is, 'why' one is entitled to make certain decisions, may be relevant for understanding the outcomes of household decision-making and may thus have policy implications.

4. CONTEXT, DATA, AND MEASURES

4.1 Context and data

We study household decision processes among Fulani dairy farmers in Northern Senegal, who have a long nomadic pastoralist history. Given the semi-arid climate of the Sahel, the Fulani and their herds move daily and seasonally in search of water and pasture. Households can affect the amount of milk produced, particularly through enhanced access to animal feed and concentrates, water, veterinary care, and limited migration. Households decide how to allocate inputs across cows and whether to sell milk or keep it for home consumption. If milk is sold, they decide how to use the revenue from milk sales.

For the Fulani, gender roles in milk production and herd management are established at a young age: young boys are responsible for monitoring the herd, while girls are trained in domestic chores and milking cows (Parisse, 2012). These early roles lay the foundation for women's responsibility for milk production and men's responsibility for herd management and meat production. Decisions regarding livestock purchase, sales, feeding, vaccinations, and migration are typically more in men's domain, while milking and decisions about milk sales are more in women's domain. Traditionally, milk production and sales were merely a by-product of meat production and livestock sales, but in recent years, with the introduction of a dairy processing company, milk production has become a more important source of household revenue.

Data on household decision processes were collected as part of a larger randomized controlled evaluation to measure the impacts of a women's training program about milk production. The study was conducted with dairy farmers who deliver milk to a local milk processing company in Northern Senegal, La Laiterie du Berger (LDB). Data used in this analysis come from a baseline survey conducted in November 2014 and an endline survey conducted in November 2015. The sample of farmers surveyed included all dairy farmers in the region who had delivered milk in the previous two years to the LDB. In total, 591 dairy farming households were surveyed at baseline and 583 were re-surveyed at endline. While specific to households engaged with the LDB, this sample nevertheless encompasses the majority of households within a 50-kilometer radius from the plant.

Each survey round was composed of three parts: a household questionnaire, an individual questionnaire, and a child questionnaire. The household questionnaire contained detailed information on milk production and a cow-level roster with information on ownership, inputs, and

outputs for each lactating cow near the concession.[6] The individual questionnaires were administered to the male household head and his wife (or his wives in cases of polygynous households).[7] They contain information on the relationship with LDB, milk production knowledge, risk preferences and trust, decision-making with respect to production and income generation, and access to productive capital.[8] In addition, the questionnaire administered to the woman includes questions on her status in the household and marriage dynamics. At endline only, the men's and women's questionnaires included a series of vignettes on milk production and consumption decisions explained in more detail below. Finally, the child questionnaire contains hemoglobin measurements for all children 12-71 months.

Our sample is the subset of households interviewed in the endline with at least one husband-wife pair involved in delivering milk to the LDB. A total of 502 households completed the individual surveys and vignettes. Of these, 375 have responses from the husband and one wife, while 127 have responses from the husband and two wives. As a result, 502 of the respondents are men and 629 are women, for a total of 1,131 observations. Among the 375 couples with responses from the husband and only one wife, 91 are in polygynous unions.

4.2 Vignettes and their implementation

The vignettes were designed to elicit information on why certain individuals make decisions within specific domains. As noted above, in the endline survey, separate men's and women's questionnaires contained vignettes—or stories – about household decision-making.

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[6] Concessions are compounds composed of 3-7 households that are usually related to each other.
[7] For polygynous households, we selected up to two wives. If there were more than two wives in the household, we selected the two who were most involved in milking of cows and who had children under 6 years of age. If these criteria did not suffice, we randomly selected two wives from the set who fulfilled the criteria.
[8] These modules were derived from the Women's Empowerment in Agriculture Index (http://www.ifpri.org/publication/womens-empowerment-agriculture-index).

Prior to conducting the vignettes, we asked a relatively standard set of questions about 'who' makes the decision concerning (a) the distribution of concentrate food among lactating cows and (b) how to spend income from the sale of milk. For ease of discussion, we refer to the former decision as the production decision and the latter as the consumption decision. Similar to other surveys, the response options included (1) the respondent without his or her spouse(s), (2) the respondent's spouse(s) without the respondent, (3) the respondent and his or her spouse(s) together, (4) the respondent and his or her spouse(s) separately, (5) another person or other people in the household, or (6) other(s) outside of the household. If the respondent reported (5) or (6), they were only asked a subset of the follow-up questions, which are not analyzed in this paper.

We tailored the vignettes to the response to these initial questions. For example, if the respondent reported that the wife decides without her husband how to spend money from milk sales, then the enumerator read a series of five vignettes in which the wife makes this decision. Each vignette provides a different reason for why the wife makes the decision. Similarly, if the respondent reported that the husband makes the decisions alone, the vignettes reflected this pattern. If the respondent stated that the husband and wife decide together how to spend money from milk sales, then the enumerator read a series of five vignettes each giving a different reason for why the couple makes the decision together. These fives reasons, described below, remain constant regardless of who reportedly made the decision.

Before administering the production vignettes, the enumerator explained, "I would like to tell you some stories about five couples in which [the husband/the wife/the husband and wife together/or the husband and wife separately] decide(s) how to allocate food among the lactating cows. After reading these stories, I will ask you some questions about how you view these couples. The five couples are married and, in each couple, the husband and wife/wives possess lactating

cows. They each have concentrated food, permitting them to ensure that certain cows stay healthy and productive." For the consumption vignettes, the enumerator changed the decision so that it was about how to spend money from the sale of milk.

The enumerators read all five stories and provided a visual aid (see Appendix A) to help the respondents distinguish among the couples. As an example, the production stories can be summarized as follows for the case where the husband makes the decisions:[9]

- Vignette 1 (*Dictator*): The first story describes how Abdul decides how to allocate concentrate food among lactating cows because he makes all of the decisions for the family.[10]

- Vignette 2 (*Contribution*): The second story states that Mody decides how to allocate the concentrate food among the lactating cows because the concentrate food comes from his own milk sales.

- Vignette 3 (*Separate Spheres*): The third story explains that Mousa decides how to allocate the concentrate food among the lactating cows because he makes all of the decisions about that particular activity while his wife makes other types of decisions for the family.

- Vignette 4 (*Norms*): The fourth story depicts how Sileye decides to allocate the concentrate food among lactating cows because it is the norm in their community for him to make these decisions.

- Vignette 5 (*Most informed*): The fifth story portrays how Bocar decides how to allocate the food among lactating cows because he has the most information regarding this activity.

If the respondent had said that someone other than the husband alone made the decision, the vignette was changed to reflect the identity of the decision-maker(s).

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[9]An excerpt from the survey instrument can be found in Appendix B

[10] Note that the literature generally uses the term "dictator" to refer to a single individual who makes all of the decisions. Throughout this paper, however, we use the term to indicate that it the same person(s) who makes all decisions, whether the husband, the wife, or the couple.

Once the respondent was familiar with all five stories, the respondent was asked whether he or she and his or her spouse(s) were similar to or different from each of the five couples, with response options of (1) completely similar, (2) somewhat similar, (3) somewhat different, and (4) completely different. The enumerator then asked which couple they resembled most, with only one possible answer. In our analysis, we analyze the response to this follow-up question regarding which couple they most resemble to identify the decision type.

Next, the enumerator asked if the decision-maker makes good choices for the respondent's household as a whole and for the respondent him/herself. Response options included (1) Yes, the best choices, (2) Yes, good choices, (3) No, not very good choices, and (4) No, bad choices. We use the responses for the household as one set of outcome measures.[11] The same approach was used regarding consumption decisions, with each couple described as deciding how to spend money from milk sales.

4.3 Outcome Measures

We assess the usefulness of the vignettes in predicting a series of production and consumption-related outcomes, thus moving beyond the 'who' makes the decisions questions that have been used in the literature thus far. For each, we consider both objective and subjective measures of outcomes. Objective measures of well-being include the standardized average milk output per cow (production) and the standardized average hemoglobin level for children 12-71 months (consumption).[12] Hemoglobin concentration is used to detect anemia of children, which is 80 percent in our sample population. Iron-deficiency anemia is responsive to improved diets, food

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[11] We focus on whether the decision was best for the household as opposed to the respondent because the sample has more women than men, which would impose structural bias on this outcome if women make decisions that promote their own interests.

[12] To standardize these variables, we simply divide the difference between each observed value and the mean by the standard deviation, resulting in a mean of zero and a standard deviation of one.

fortification, and supplementation (Le Port et al., 2017). Subjective measures are based on respondents' own assessment of whether the identified decision-maker makes good choices for the respondent's household. For both production and consumption, the majority of men and women respondents report that the decision-maker makes the best choices for the household (approximately 85 percent). Very few (2 percent) respondents report that the decision-maker did not make good choices for their household.[13] Summary statistics for the outcome measures are presented in Appendix Table C.1.

5. HOW RELIABLE ARE VIGNETTE-BASED MEASURES?

To be analytically useful, a measurement tool must display an acceptable level of reliability. Reliability is understood as the instrument's capacity to produce a consistent measure independent of variations in the implementation of the survey.[14] We first assess *observer reliability*, according to which one expects that enumerators' characteristics do not affect respondents' answers to the survey instrument. While we did not randomly allocate enumerators across surveyed households, we did not allocate them based on expected household types as measured by the vignettes. We therefore use this independent allocation of enumerators to assess whether their characteristics, and in particular their gender, is correlated with respondents' answers to vignette questions.

Second, we investigate *respondent reliability* by assessing whether respondent characteristics systematically affect the answers given. We do so by making use of spouses'

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[13] Due to the small number of responses in the categories "No, not very good choices" and "No, bad choices," we later combine these responses into one "No" category.

[14] Most investigations into the reliability of an instrument also include so-called test-retest measures, in which a respondent is asked a question and then asked the same question again after some amount of time (for instance, two weeks). Reliability is then assessed as the extent to which the same responses are given both times (see Bernard and Taffesse (2014) or Laajaj and Macours (2017) for recent examples). For logistical reasons, we were not able to perform test-retest measures in our study.

independent answers to the same vignette questions regarding their own households and evaluate whether, in the same household, age and sex affect the response. Because vignettes are in part meant to capture gender-based participation in decision-making, we expect to find some differences across male and female answers. Thus, as a benchmark, we run similar tests on the widely used questions regarding 'who' makes the decision to gauge the vignettes' respondents' reliability.

Lastly, we test for issues of *anchoring effects*, according to which the order of questions may affect responses. Specifically, we introduced two random variations in the ordering of the questionnaire: for half of the respondents, consumption-related questions were asked before production questions and vice versa; for half of the questionnaires, respondents were first asked about the type of household that they admire before answering which household they most resemble. We test whether these ordering variations caused systematic differences in the way respondents answered the vignette-based questions.

We test for observer reliability, respondent reliability, and anchoring effects by estimating OLS regressions of each household typology on each factor separately (enumerator characteristics, respondent characteristics, and ordering). For respondent reliability tests, for which sex and age varies across respondents within the same household, we add household fixed effects to the estimations. Results are presented in Table 1.[15]

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[15] We do not control for any other household or individual characteristics in these regressions. However, we account for non-independent errors across individuals of the same household by clustering the standard errors at the household-level. Clustering the errors also means that they are robust to heteroskedasticity.

Table 1: Reliability test vignettes

	Production					Consumption				
	Dictator	Contribution	Separate spheres	Norms	Most informed	Dictator	Contribution	Separate spheres	Norms	Most informed
Respondent is male	-0.009	-0.026	-0.023	0.007	0.051	0.014	-0.026	0.035	-0.013	-0.010
	(0.029)	(0.016)	(0.020)	(0.019)	(0.025)*	(0.027)	(0.019)	(0.024)	(0.019)	(0.024)
Constant	0.427	0.090	0.148	0.104	0.231	0.304	0.122	0.217	0.121	0.235
	(0.019)**	(0.011)**	(0.013)**	(0.013)**	(0.016)**	(0.018)**	(0.013)**	(0.016)**	(0.013)**	(0.016)**
N	1,070	1,070	1,070	1,070	1,070	1,065	1,065	1,065	1,065	1,065
Age of respondent	-0.002	-0.001	-0.002	-0.000	0.005	0.001	-0.002	0.001	-0.000	0.001
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)**	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.492	0.121	0.221	0.116	0.050	0.267	0.189	0.205	0.138	0.201
	(0.077)**	(0.044)**	(0.054)**	(0.051)*	(0.067)	(0.074)**	(0.052)**	(0.066)**	(0.052)**	(0.066)**
N	1,069	1,069	1,069	1,069	1,069	1,064	1,064	1,064	1,064	1,064
Enumerator is male	0.069	-0.008	-0.027	0.072	-0.106	0.120	0.004	-0.055	0.002	-0.071
	(0.036)	(0.018)	(0.025)	(0.018)**	(0.033)**	(0.031)**	(0.022)	(0.031)	(0.022)	(0.031)*
Constant	0.377	0.084	0.156	0.059	0.324	0.231	0.108	0.269	0.114	0.278
	(0.029)**	(0.015)**	(0.021)**	(0.012)**	(0.029)**	(0.023)**	(0.017)**	(0.026)**	(0.019)**	(0.027)**
N	1,069	1,069	1,069	1,069	1,069	1,065	1,065	1,065	1,065	1,065
Vignettes A first	0.064	0.027	0.013	-0.062	-0.042	-0.064	-0.010	0.033	-0.011	0.052
	(0.033)	(0.017)	(0.023)	(0.020)**	(0.029)	(0.030)*	(0.021)	(0.028)	(0.021)	(0.028)
Constant	0.391	0.065	0.132	0.138	0.274	0.341	0.116	0.217	0.121	0.206
	(0.023)**	(0.011)**	(0.015)**	(0.016)**	(0.021)**	(0.022)**	(0.016)**	(0.019)**	(0.016)**	(0.018)**
N	1,070	1,070	1,070	1,070	1,070	1,065	1,065	1,065	1,065	1,065
Question 7 first	0.030	0.017	0.004	0.010	-0.061	0.053	-0.047	0.038	-0.015	-0.030
	(0.033)	(0.017)	(0.023)	(0.020)	(0.029)*	(0.030)	(0.021)*	(0.028)	(0.021)	(0.028)
Constant	0.407	0.070	0.136	0.102	0.284	0.283	0.135	0.213	0.123	0.246
	(0.023)**	(0.011)**	(0.016)**	(0.013)**	(0.022)**	(0.021)**	(0.017)**	(0.019)**	(0.016)**	(0.022)**
N	1,070	1,070	1,070	1,070	1,070	1,065	1,065	1,065	1,065	1,065

Standard errors in parenthesis clustered at the household level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$

We find little evidence of respondent reliability issues: gender and age only affect the likelihood that the decision-maker is chosen because they are the *most informed* in production decisions. Regarding observer reliability, our results suggest that male enumerators are more likely to obtain responses to vignette questions associated with *community norms* and less likely to obtain responses to questions associated with *most informed*, for production decisions. For consumption decisions, our results suggest that male enumerators are more likely to obtain responses to questions associated with *dictator* and less likely to obtain responses to questions associated with *most informed*. We also find evidence of anchoring effects. When asked about production vignettes (vignettes A) before consumption ones, respondents are less likely to say that their household is most like the *community norms* model in production, while they are less like the *dictator* model in consumption. Similarly, when first asked about themselves before a couple they admire, respondents are less likely to report the *most informed* model in production, and less likely to report the *contribution* model in consumption. While none of the reported coefficients are large in magnitude, they do call for specific attention to questionnaire design.

These reliability issues are not specific to vignettes however. In Table 2 we report the same set of estimates, this time using the "who decides" questions instead of the vignettes. We also find evidence of significant reliability issues. In particular, we find signs of respondent bias that appear more pronounced than in the vignette-based questions. For the production decision, a domain dominated by men, men claim more sole decision-making of husbands and less sole decision-making of wives than women claim. In contrast, for the consumption decision, which is dominated by women, women claim more sole decision-making power than men report. Age is also significantly correlated with the wife saying she decides without her husband for both production and consumption. Similarly, we find evidence of observer bias, with male enumerators being less

likely to obtain answers for husbands deciding without wives for production and wives deciding without husbands for consumption decisions, and more likely to obtain answers where husbands and wives make decisions together. Finally, we find some evidence of anchoring effects with the order of production versus consumption decisions influencing who decides in consumption but not production.[16] In particular, when the production vignettes were administered first, fewer respondents report that husbands make consumption decisions without wives.

Table 2: Reliability test on who decides questions

	Production			Consumption		
	Husband without wife	Wife without husband	Husband and wife together	Husband without wife	Wife without husband	Husband and wife together
Respondent is male	0.077	-0.086	0.025	-0.011	0.052	-0.023
	(0.025)**	(0.018)**	(0.020)	(0.022)	(0.024)*	(0.022)
Constant	0.532	0.193	0.218	0.239	0.487	0.208
	(0.016)**	(0.012)**	(0.013)**	(0.014)**	(0.016)**	(0.014)**
N	1,112	1,112	1,112	1,112	1,112	1,112
Age of respondent	0.002	-0.003	0.002	-0.002	0.003	-0.001
	(0.002)	(0.001)**	(0.001)	(0.001)	(0.002)*	(0.001)
Constant	0.463	0.297	0.161	0.309	0.359	0.231
	(0.068)**	(0.051)**	(0.056)**	(0.059)**	(0.067)**	(0.060)**
N	1,111	1,111	1,111	1,111	1,111	1,111
Enumerator is male	-0.082	-0.025	0.124	0.028	-0.074	0.060
	(0.037)*	(0.028)	(0.029)**	(0.031)	(0.038)*	(0.027)*
Constant	0.620	0.172	0.148	0.216	0.559	0.158
	(0.030)**	(0.023)**	(0.021)**	(0.024)**	(0.031)**	(0.021)**
N	1,111	1,111	1,111	1,111	1,111	1,111
Vignettes A first	-0.009	-0.035	0.043	-0.079	0.051	0.050
	(0.036)	(0.026)	(0.031)	(0.030)**	(0.036)	(0.027)
Constant	0.571	0.172	0.208	0.273	0.485	0.173
	(0.025)**	(0.019)**	(0.021)**	(0.022)**	(0.026)**	(0.018)**
N	1,112	1,112	1,112	1,112	1,112	1,112

Standard errors in parenthesis clustered at the household level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$

Overall, vignette-based assessments of 'why' certain individuals make a particular decision display reliability issues. These issues call for careful interpretation of answers, controlling for

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[16] We do not look at anchoring effects with respect to the ordering of which couple they admire because this question always occurred after the response to who makes the decision.

respondent characteristics (and in particular gender) in regression frameworks, as well as extended enumerator training to reduce potential observer biases. These reliability issues are, however, comparable to those of 'who decides' questions, which are currently employed in many surveys.
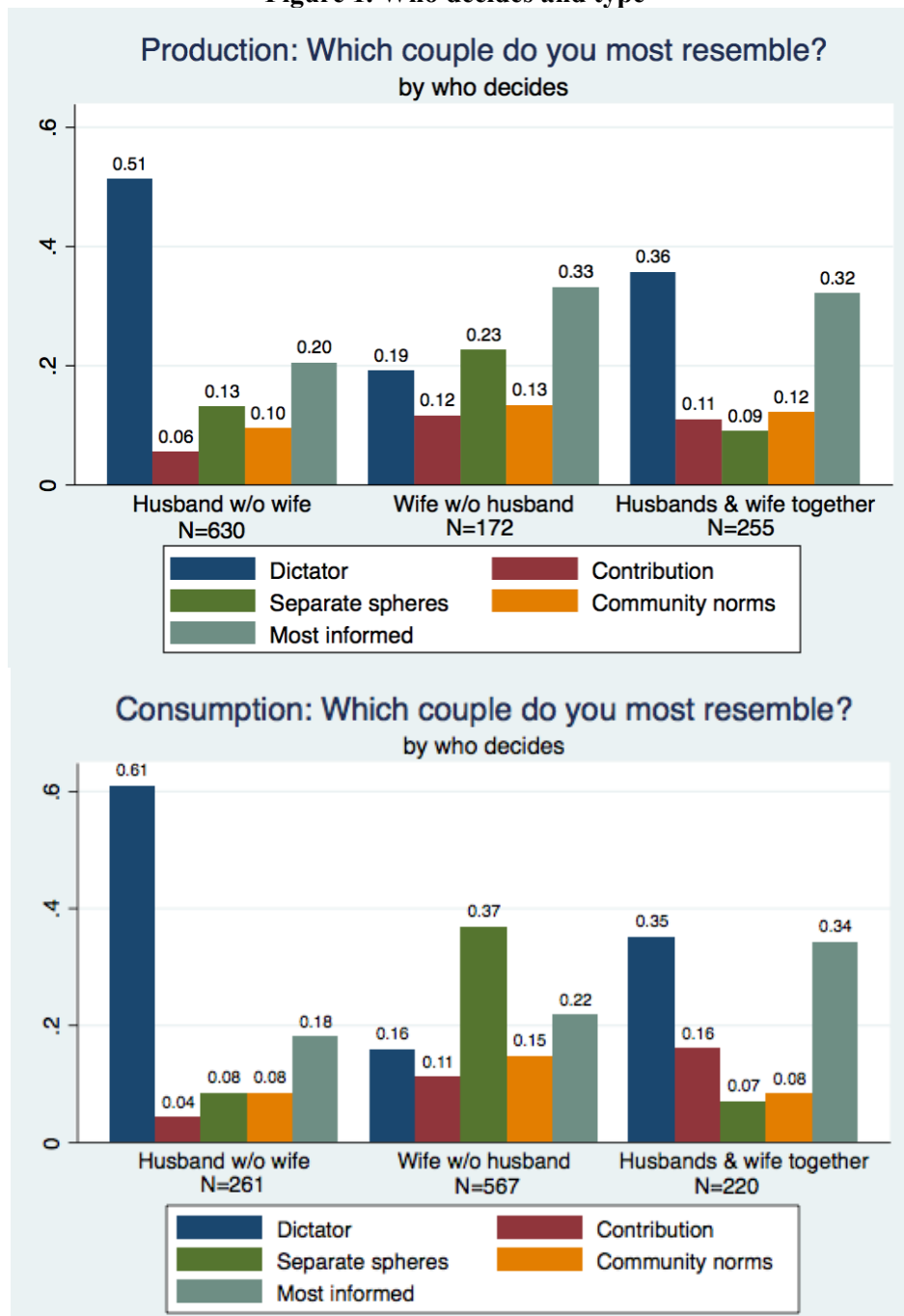
6. HOW CONCURRENTLY VALID ARE VIGNETTE-BASED MEASURES OF HOUSEHOLD TYPE?

In this section we evaluate whether vignettes-based measures of household types explain variation in production and consumption outcomes, above and beyond what is explained by the identity of the decision-maker. We start by investigating the degree of overlap in respondents' answers to 'who' and 'why' related questions. We then investigate their degree of complementarity in explaining outcomes.

6.1 Correspondence between 'who' decides and household types

In Figure 1 we graphically present responses to questions on who decides and the type of household respondents most resemble (see also Appendix Figure C.1 for sex-disaggregated analysis). For all subsequent analysis we only include observations where the identity of the decision-maker is either 1) husband without wife; 2) wife without husband; or 3) wife and husband together. The other categories have too few observations (see Appendix tables C.2 and C.3).

Figure 1. Who decides and type

Production: Which couple do you most resemble?
by who decides

Consumption: Which couple do you most resemble?
by who decides

For both decisions we find a strong correspondence between the husband being the main decision-maker and the household being categorized as the *dictator* type. Over 50% (60%) of the

respondents who said that the husband made the decisions regarding production (consumption) reported that in their household one person made most of the decisions. However, a significant share (around 20% for both decisions) considered their household to be the *most informed* type, while around 10 percent considered it to be the *separate sphere* type. There is more diversity in answers when the wife is reported as the main decision-maker. In this case, respondents are more likely to report that they resemble the *most informed* type for production, and the *separate spheres* type for consumption. These only represent one third of the answers, however, with the remaining responses distributed across the other types. When both husbands and wives jointly make the decision for production and consumption, respondents mostly assign the *dictator* or the *most informed* type to their household, in fairly equal proportions.

Overall, despite a significant correspondence between husbands being in charge of the decisions and the *dictator* type of households, we find important heterogeneity of household types within each decision-maker category. In other words, respondents find different reasons to explain the fact that a given individual within their household is the decision-maker. We next investigate whether these different reasons help explain heterogeneity in final outcomes.

6.2. To what extent do vignettes help explain outcomes?

We assess how the different household types correlate with outcome variables using the subjective satisfaction measure and an objective outcome for both production and consumption decisions. As a benchmark, we start from the analysis of the correlations between who decides and the outcomes of interest, as is usually reported in empirical analyses of decision-making:

$$Y_{ih}^d = \alpha + \boldsymbol{D}_{ih}^{d\,'}\boldsymbol{\beta} + \boldsymbol{X}_{ih}'\boldsymbol{\gamma} + \varepsilon_{ih} \qquad (1)$$

where Y_{ih}^d is the production or consumption outcome d for individual i from household h. $\boldsymbol{D}_{ih}^d$ is a vector of dummy variables indicating whether it is the wife without her husband or the husband

without his wife who decides for decision domain d. The omitted category is husband and wife decide together, such that coefficients in the $\boldsymbol{\beta}$ vector measure the difference in means of each category compared to the husband and wife deciding together. X_{ih} is a vector of control variables that includes individual characteristics (age, sex, polygyny status, and literacy status) and household characteristics (milk route, the number of lactating cows, household size, and number of children 0-5 years[17]). See Appendix table C.1 for summary statistics on the control variables. Standard errors are clustered at the household level. For the satisfaction outcomes - whether the decision was the "best" decision, we run probit models and report the marginal effects evaluated at the mean. For the standardized milk production and hemoglobin level we run Ordinary Least Squares models.

We then add household type to the estimation equation to analyze its association with the production or consumption outcomes, holding who decides constant:

$$Y_{ih}^d = \alpha + \boldsymbol{D_{ih}^d}'\boldsymbol{\beta} + \boldsymbol{T_{ih}^d}'\boldsymbol{\delta} + \boldsymbol{X_{ih}'}\boldsymbol{\gamma} + \varepsilon_{ih} \qquad (2)$$

where $\boldsymbol{T_{ih}^d}$ is a vector of dummy variables indicating the *dictator*, *separate sphere*, *contribution*, or *norms* type, for decision domain d. The omitted category is the *most informed* type of household, such that coefficients in the $\boldsymbol{\delta}$ vector measure the difference in means of each category compared to the *most informed* category. Lastly, since we are interested in the variation within each category of who decides, we estimate the impacts of household type on subjective and objective outcomes for each 'who' category separately:

$$Y_{ih}^d = \alpha + \boldsymbol{T_{ih}^d}'\boldsymbol{\delta} + \boldsymbol{X_{ih}'}\boldsymbol{\gamma} + \varepsilon_{ih} \quad (3)$$

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[17] Consumption outcomes also include an indicator for whether or not there was more than 1 child measured for hemoglobin.

6.2.1 Results

We first consider how the identity of the decision-maker is correlated with the outcomes. Table 3 presents the results of estimating equation (1). For production there are no significant associations between who decides and the outcomes of interest. For consumption, either the husband or wife deciding alone is associated with better hemoglobin outcomes compared to situations where the husband and wife decide together (see Appendix Tables C.4 and C.5 for sex-disaggregated outcomes).

Table 3: Who decides

	Production		Consumption	
	Best production decision for household	Standardized weekly milk output (L) per cow	Best consumption decision for household	Standardized hemoglobin per child 12-71 months
Husband without wife	0.01	0.05	-0.03	0.28
	(0.03)	(0.09)	(0.03)	(0.11)***
Wife without husband	-0.04	-0.06	-0.02	0.33
	(0.03)	(0.08)	(0.03)	(0.10)***
N	1,042	1,043	1,033	788
R^2		0.06		0.03

Omitted category is husband and wife deciding together. Standard errors in parenthesis clustered at the household level. * p<0.1 ** p<0.05; *** p<0.01
The vector of control variables includes individual characteristics (age, sex, polygyny status, and literacy status) and household characteristics (milk route, the number of lactating cows, household size, and number of children 0-5 years). For the satisfaction outcomes - whether the decision was the "best" decision, we run probit models and report the marginal effects evaluated at the mean. For the mean milk production and hemoglobin level we run Ordinary Least Squares models.

Adding household typology (equation 2) does not qualitatively change the findings on the relationship between who decides and production and consumption outcomes (Table 4). Compared to the *most informed* person or couple making the decision (the omitted household type), all of the statistically significant results are negative, suggesting that the *most informed* category is correlated with better household outcomes for both production and consumption. The *dictator* category is associated with significantly lower mean milk output and hemoglobin levels. The *contribution* and *separate spheres* categories are associated with a significantly lower likelihood

of reporting that the production decision was the best for the household. Similarly, the *contribution* category is associated with a significantly lower likelihood of reporting that the consumption decision was the best for the household. The *norms* category is associated with significantly lower milk production (see Appendix Tables C.6 and C.7 for sex-disaggregated outcomes).

Table 4: Who decides and type

	Production		Consumption	
	Best production decision for household	Standardized weekly milk output (L) per cow	Best consumption decision for household	Standardized hemoglobin per child 12-71 months
Husband without wife	0.00	0.08	-0.03	0.34
	(0.03)	(0.09)	(0.03)	(0.11)***
Wife without husband	-0.02	-0.08	-0.03	0.29
	(0.03)	(0.08)	(0.03)	(0.11)***
Dictator	0.02	-0.19	-0.02	-0.18
	(0.03)	(0.06)***	(0.03)	(0.11)
Contribution	-0.09	-0.01	-0.08	0.07
	(0.04)**	(0.14)	(0.04)**	(0.12)
Separate spheres	-0.07	-0.09	0.03	-0.02
	(0.04)**	(0.11)	(0.03)	(0.12)
Norms	-0.04	-0.38	-0.06	0.12
	(0.04)	(0.09)***	(0.04)	(0.12)
N	1,042	1,043	1,033	788
R^2		0.07		0.04

Omitted who category is husband and wife deciding together and omitted type is most informed.
Standard errors in parenthesis clustered at the household level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$

Finally, we regress the interactions between *who* decides and *why* that individual or couple decides on production and consumption outcomes and present the results in Table 5 (see figure 2 for unadjusted means). The omitted category is the husband and wife decide together because they are the *most informed*. Table 5 reveals that many categories are negatively associated with production outcomes as well as satisfaction with the consumption decision and are positively associated with hemoglobin levels, compared to the couple deciding together because they are *most informed*. The findings also suggest that many outcomes are worse when *community norms* dictate who decides and when the wife decides alone because she is the d*ictator*, relative to the omitted category.

When the husband makes the production decision without his wife or the couple decides due to *separate spheres*, it is associated with significantly lower likelihood that the production decision is best for the household compared to when the couple decides together because they are the *most informed*. Lower levels of satisfaction with the production decision are associated with the wife making the production decision without her husband or the couple deciding because they *contribute*. Both satisfaction with the production decision and milk production are negatively correlated with the wife deciding alone because she is the *dictator*. Regardless of who decides, milk production is significantly lower when the decision-maker is determined by *community norms*, relative to the comparison group.

While the coefficients on satisfaction with the consumption decision tend to follow a similar pattern to the production outcomes, hemoglobin levels are positively correlated with several categories, relative to the couple deciding because they are *most informed*. In particular, when either the husband or the wife makes the consumption decision alone due to *community norms*, it is negatively correlated with satisfaction with the decision, but positively correlated with hemoglobin levels. Similarly, the wife deciding alone because she *contributes* is associated with lower satisfaction with the decision and higher hemoglobin levels. There are also lower levels of satisfaction with the consumption decision when the wife decides alone because she is the *dictator*. In general, across all household typologies, hemoglobin levels are higher if either the husband or wife alone makes the consumption decision, while the outcome is worse when the couple decides together, compared to both deciding because they are *most informed*. This may be indicative of inefficiencies arising from conflict between spouses making joint decision when they are not the *most informed*, but we do not formally test this hypothesis.

Using Wald tests, we assess whether the *dictator* and *most informed* types differ within each category of who decides. We reject the null hypothesis of equality between coefficients for husbands who decide alone because they are the *dictator* as opposed to the *most informed* for milk production, but fail to reject for all other outcomes. Conversely, we reject equality between these two typologies when the husband and wife decide together for all outcomes except the subjective production decision. We then test for joint significance by type. For the *dictator* type, we reject the null hypothesis of no joint significance for the satisfaction with the production and consumption decisions for the household. For the *contribution* type, we only reject no joint significance for satisfaction with the production decision, while for the *separate spheres* type we only reject the null hypothesis for milk production. We fail to reject the null of no joint significance of the *norms* type across all outcomes. These findings highlight the importance of understanding the rationale behind who decides.

Table 5: Who decides interacted with type

	Production		Consumption	
	Best production decision for household	Standardized weekly milk output (L) per cow	Best consumption decision for household	Standardized hemoglobin per child 12-71 months
Husband without wife, Dictator	-0.02	-0.07	-0.05	0.15
	(0.05)	(0.11)	(0.05)	(0.17)
Husband without wife, Contribution	-0.10	0.22	0.02	0.08
	(0.08)	(0.37)	(0.13)	(0.21)
Husband without wife, Separate spheres	-0.10	-0.09	0.02	0.31
	(0.06)*	(0.16)	(0.10)	(0.28)
Husband without wife, Norms	-0.10	-0.35	-0.15	0.62
	(0.06)	(0.10)***	(0.08)*	(0.35)*
Husband without wife, Most informed	-0.06	0.08	-0.11	0.06
	(0.05)	(0.14)	(0.07)	(0.20)
Wife without husband, Dictator	-0.15	-0.60	-0.10	-0.00
	(0.07)**	(0.12)***	(0.06)*	(0.20)
Wife without husband, Contribution	-0.14	0.00	-0.13	0.33
	(0.08)*	(0.16)	(0.06)**	(0.20)*
Wife without husband, Separate spheres	-0.08	-0.03	-0.01	0.21
	(0.07)	(0.15)	(0.05)	(0.18)
Wife without husband, Norms	-0.05	-0.33	-0.11	0.33
	(0.08)	(0.14)**	(0.06)**	(0.18)*
Wife without husband, Most informed	-0.08	-0.01	-0.02	0.29
	(0.07)	(0.15)	(0.06)	(0.19)
Husband and wife together, Dictator	0.01	-0.14	-0.03	-0.28
	(0.06)	(0.12)	(0.06)	(0.20)
Husband and wife together, Contribution	-0.17	-0.21	-0.11	0.09
	(0.07)**	(0.13)	(0.07)	(0.23)
Husband and wife together, Separate spheres	-0.23	0.04	-0.15	-0.10
	(0.08)***	(0.22)	(0.09)	(0.43)
Husband and wife together, Norms	-0.08	-0.32	0.09	-0.09
	(0.08)	(0.15)**	(0.12)	(0.33)
N	1,042	1,043	1,033	788
P-value: Husband without wife, dictator = Husband without wife, most informed	0.25	0.09	0.29	0.61
P-value: Wife without husband, dictator = Wife without husband, most informed	0.31	0.00	0.10	0.09
P-value: Joint Dictator type=0	0.08	0.33	0.09	0.37
P-value: Joint Contribution type=0	0.03	0.94	0.34	0.48
P-value: Joint Seperate Spheres type=0	0.44	0.01	0.06	0.11
P-value: Joint Norms type=0	0.47	0.77	0.20	0.26
R^2		0.08		0.05

Omitted category is husband and wife decide together because they are most informed.
Standard errors in parenthesis clustered at the household level. * p<0.1 ** p<0.05; *** p<0.01

Figure 2: Means by who and type categories
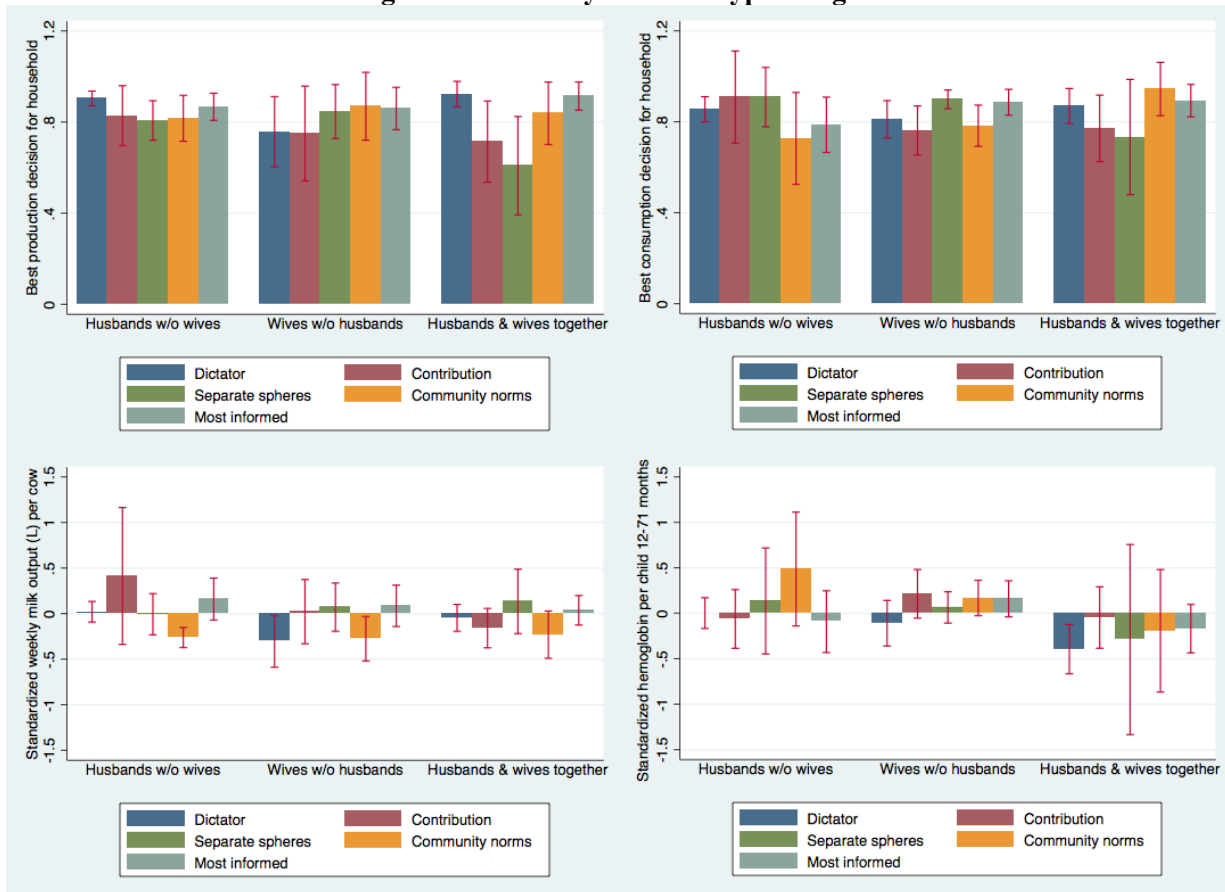
Error bars show 95% confidence intervals.

7. DISCUSSION AND CONCLUSION

Developing policies and programs that reduce gender inequalities and the inefficiencies propagated by such inequalities requires a more thorough understanding of decision-making processes within households. The standard practice among studies investigating decision-making within households relies on identifying who makes certain decisions. We argue that this is insufficient. We question the assumption that making more decisions implies that one is more empowered. Understanding both *who* makes production and consumption decisions within the

household as well as *why* that person (or the couple) is the decision-maker can provide more insights into intrahousehold dynamics than simply considering who makes the decision.

By analyzing a series of vignettes, we shed light on the black box of household decision-making processes. Our results suggest that, while there is little correlation between who makes the decision (the husband, wife, or couple) and production and consumption outcomes, households generally achieve better outcomes when the *most informed* person or couple makes the decision, and worse outcomes when *community norms* dictate who makes the decisions. We also find evidence that many outcomes are better when husband and wives make joint decisions because they are both *most informed*, but outcomes many be worse if the couple decides together for other reasons.

These insights provide guidance on how programs and policies may work to improve agricultural production, child health, as well as individual satisfaction with decision-making processes. While there is intrinsic value in enhancing women's ability to have an equal say in decisions if they so choose, there may be additional benefits associated with the most informed individual or couple making decisions. Thus, extension programs and health and nutrition interventions should consider increasing the knowledge of both men and women rather than focusing efforts on men or whichever household member currently carries out tasks in specific domains. Organizations can also develop trainings to promote dialogue between household members regarding the division of household decisions in order to change norms.

We have demonstrated the importance of asking respondents 'why.' There is a clear link between the rationale for decision-making and household outcomes. However, questions remain regarding whether changing household typology will have the desired effects on production and consumption outcomes. Further research is also needed to identify what mechanisms can

successfully shift households towards a more efficient allocation of decision-making
responsibilities in which individuals are satisfied with both the outcomes and the processes of
decision-making.

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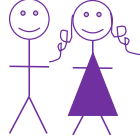
Appendix A: Visual Aid for Vignettes
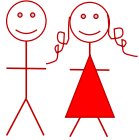
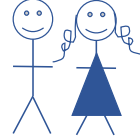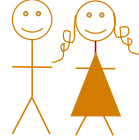| 1	2	3	4	5
Abdou et Mariama	Mody et Faty	Moussa et Bineta	Sileye et Aminata	Bocar et Debo

Appendix B: Survey Instrument Excerpt

A. Cooperation – Production: How to allocate food among the cows

ENUMERATOR READ : I would now like to ask you some questions about the allocation of food among lactating cows

QUESTION 1

In your household, who contributes to decisions concerning the distribution of food among lactating cows, in general? Does your husband make these decisions without you, do you make these decisions without your husband, do you and your husband make these decisions together, or do you and your husband make these decisions separately?

1=The husband of the respondent without the respondent (CAPI: Skip A11-A43)
2=The respondent without her husband (CAPI: Skip A1-A10 and A21-A43)
3=The respondent and her husband together (CAPI: Skip A1-A20 and A31-A43)
4=The respondent and her husband separately (CAPI : Skip A1-A30 and A41-A43)
5=Another person or other people in the household (CAPI: Skip A1-A40)
78=Other(s) outside of the household (CAPI: Skip A1-A40)

WHO MAKES THE DECISION		STORY	QUESTION 2	QUESTION 3	QUESTION 4
INSTRUCTIONS: Read the introduction below and all five stories before producting to A1 Question 2. ENUMERATOR READ: «I would like to tell you some stories about five couples in which the husband decides how to allocate food among the lactating cows. After reading these stories, I will ask you some questions about how you view these couples. The five couples are married and, in each couple, the husband and wife/wives possess lactating cows. They each have concentrated food permitting them to ensure that certain cows stay healthy and productive. »					
The husband of the respondent without the respondent	**A1**	*«Abdou and Mariama are married. Abdou decides how to allocate the concentrated food among the lactating cows because he makes all decisions for the family.»*	Do you and your husband resemble this couple? 1=Yes →Skip to Question 3 2=No →Skip to Question 4	Is your couple completely similar or only somewhat similar to this couple? 1=Completely similar → Skip to A2 2=Somewhat similar → Skip to A2	Is your couple completely different or only somewhat different from this couple? 1=Completely different 2=Somewhat different
	A2	*«Mody et Faty are married. Mody decides how to allocate the concentrated food among the lactating cows because the concentrated food comes from his own milk sales."*	Do you and your husband resemble this couple? 1=Yes →Skip to Question 3 2=No →Skip to Question 4	Is your couple completely similar or only somewhat similar to this couple? 1=Completely similar → Skip to A3 2=Somewhat similar → Skip to A3	Is your couple completely different or only somewhat different from this couple? 1=Completely different 2=Somewhat different

A3	*« Mousa and Bineta are married. Mousa decides how to allocate the concentrated food among the lactating cows because he makes these decisions while Bineta makes other decisions for the family."*	Do you and your husband resemble this couple? 1=Yes →Skip to Question 3 2=No →Skip to Question 4	Is your couple completely similar or only somewhat similar to this couple? 1=Completely similar → Skip to A4 2=Somewhat similar → Skip to A4	Is your couple completely different or only somewhat different from this couple? 1=Completely different 2=Somewhat different
A4	*« Sileye and Aminata are married. Sileye decides how to allocate the concentrated food among the lactating cows because most men in the community make these decisions."*	Do you and your husband resemble this couple? 1=Yes →Skip to Question 3 2=No →Skip to Question 4	Is your couple completely similar or only somewhat similar to this couple? 1=Completely similar → Skip to A5 2=Somewhat similar → Skip to A5	Is your couple completely different or only somewhat different from this couple? 1=Completely different 2=Somewhat different
A5	*« Bocar et Debo sont mariés. Bocar decides how to allocate the concentrated food among the lactating cows because he has the most information on the herd, so he knows how to distribute the concentrated food."*	Do you and your husband resemble this couple? 1=Yes →Skip to Question 3 2=No →Skip to Question 4	Is your couple completely similar or only somewhat similar to this couple? 1=Completely similar → Skip to A6 2=Somewhat similar → Skip to A6	Is your couple completely different or only somewhat different from this couple? 1=Completely different 2=Somewhat different
A6		Among the couples that you resemble, which is the MOST similar to your couple? (CAPI : Prefill couples for which Q2=1) (Choose one response) 1=Abdou and Mariama 2=Mody and Faty 3=Mousa and Bineta 4=Sileye and Aminata 5=Bocar and Debo		

	A7		(CAPI : If A6=1, load the following question) You told me that your couple is similar to the couple in which the husband makes all of the decisions for the family. When your husband decides how to allocate the concentrated food among the lactating cows, does he make good decisions for your household? (CAPI : If A6=2, load the following question) You told me that your couple is similar to the couple in which the husband decides how to allocate the food among the lactating cows because the concentrated food comes from his own milk sales. When your husband decides how to allocate the concentrated food among the lactating cows, does he make good decisions for your household? (CAPI : If A6=3, load the following question) You told me that your couple is similar to the couple in which the husband decides how to allocate the food among the lactating cows because he makes these decisions while his wife makes other decisions. When your husband decides how to allocate the concentrated food among the lactating cows while you make other decisions, do you (plural) make good decisions for your household? (CAPI : If A6=4, load the following question) You told me that your couple is similar to the couple in which the husband decides how to allocate the food among the lactating cows because most men in the community make these decisions. When	(CAPI : If A6=1 or A6=2 or A6=4 or A6=5, load the following question) Does he make the best possible choices for your household or does he only make choices that are generally good for your household? 1=The best choices → Skip to A8 2=Good choices → Skip to A8 (CAPI : If A6=3, load the following question) Do you (plural) make the best possible choices for your household or do you only make choices that are generally good for your household? 1=The best choices → Skip to A8 2=Good choices → Skip to A8	(CAPI : If A6=1 or A6=2 or A6=4 or A6=5, load the following question) Does he make choices that are bad for your household or does he only make choices that are not generally very good for your household? 1=Bad choices 2=Choices that are not very good (CAPI : If A6=3, load the following question) Do you (plural) make choices that are bad for your household or do you only make choices that are not generally very good for your household? 1=Bad choices 2=Choices that are not very good

			your husband decides how to allocate the concentrated food among the lactating cows, does he make good decisions for your household? (CAPI : If A6=5, load the following question) You told me that your couple is similar to the couple in which the husband decides how to allocate the food among the lactating cows because he has the most information on the herd, so he knows how to distribute the concentrated food. When your husband decides how to allocate the concentrated food among the lactating cows, does he make good decisions for your household? 1=Yes →Skip to Q3 2=No →Skip to Q4		
	A8		(CAPI : If A6=1, load the following question) You told me that your couple is similar to the couple in which the husband makes all of the decisions for the family. When your husband decides how to allocate the concentrated food among the lactating cows, does he make good decisions for you (singular)? (CAPI : If A6=2, load the following question) You told me that your couple is similar to the couple in which the husband decides how to allocate the food among the lactating cows because the concentrated food comes from his own milk sales. When	(CAPI : If A6=1 or A6=2 or A6=4 or A6=5, load the following question) Does he make the best possible choices for you (singular) or does he only make choices that are generally good for you (singular)? 1=The best choices → Skip to A9 2=Good choices → Skip to A9 (CAPI : If A6=3, load the following question) Do you (plural) make the best possible choices for you (singular) or	(CAPI : If A6=1 or A6=2 or A6=4 or A6=5, load the following question) Does he make choices that are bad for you (singular) or does he only make choices that are not generally very good for you (singular)? 1=Bad choices 2=Choices that are not very good (CAPI : If A6=3, load the following question)

				your husband decides how to allocate the concentrated food among the lactating cows, does he make good decisions for you (singular)? (CAPI : If A6=3, load the following question) You told me that your couple is similar to the couple in which the husband decides how to allocate the food among the lactating cows because he makes these decisions while his wife makes other decisions. When your husband decides how to allocate the concentrated food among the lactating cows while you make other decisions, do you (plural) make good decisions for you (singular)? (CAPI : If A6=4, load the following question) You told me that your couple is similar to the couple in which the husband decides how to allocate the food among the lactating cows because most men in the community make these decisions. When your husband decides how to allocate the concentrated food among the lactating cows, does he make good decisions for you (singular)? (CAPI : If A6=5, load the following question) You told me that your couple is similar to the couple in which the husband decides how to allocate the food among the lactating cows because he has the most information on the herd, so he knows how to distribute the concentrated food. When your husband decides how to allocate the concentrated food among the lactating cows, does he make good decisions for you (singular)?	do you only make choices that are generally good for you (singular)? 1=The best choices → Skip to A9 2=Good choices → Skip to A9	Do you (plural) make choices that are bad for you (singular) or do you only make choices that are not generally very good for you (singular)? 1=Bad choices 2=Choices that are not very good

|					
			1=Yes →Skip to Q3 2=No →Skip to Q4		
	A9		Now I would like to ask you to think of a couple that you admire. In this couple, who decides how to allocate the food among the lactating cows? (Choose one response) 1=The husband without his wife/wives 2=The wife without her husband 3=The husband and wife/wives together 4= The husband and wife/wives separately		
	A10		(CAPI : If A9=1, load the following question) Among the five couples that we have discussed, which one does the couple that you admire resemble? (Choose one response) 1=Abdou and Mariama 2=Mody and Faty 3=Mousa and Bineta 4=Sileye and Aminata 5=Bocar and Debo 99=None of the couples		

Appendix C: Supplementary Figures and Tables

Table C.1: Summary Statistics

	N	Mean	Standard deviation
PRODUCTION			
Who decides and type			
Husband without wife	1,096	0.575	0.495
Wife without husband	1,096	0.157	0.364
Husband and wife together	1,096	0.233	0.423
Dictator	1,067	0.422	0.494
Contribution	1,067	0.079	0.269
Separate spheres	1,067	0.138	0.345
Norms	1,067	0.108	0.310
Most informed	1,067	0.254	0.435
Outcomes			
Best production decision for household	1,066	0.857	0.350
Mean weekly milk output (L) per cow	1,102	10.74	7.922
CONSUMPTION			
Who decides and type			
Husband without wife	1,096	0.238	0.426
Wife without husband	1,096	0.517	0.500
Husband and wife together	1,096	0.201	0.401
Dictator	1,063	0.310	0.463
Contribution	1,063	0.110	0.313
Separate spheres	1,063	0.233	0.423
Norms	1,063	0.116	0.320
Most informed	1,063	0.231	0.422
Outcomes			
Best consumption decision for household	1,063	0.849	0.359
Mean hemoglobin per child 12-71 months	849	9.846	1.325
CONTROL VARIABLES			
Female	1,115	0.552	0.497
Age of HH member	1,114	43.73	14.39
HH member is polygnous	1,115	0.552	0.497
HH member illiterate	1,114	0.855	0.352
Number of cows in roster, endline	1,102	6.163	3.566
Household size	1,115	10.07	4.287
Number of children under 5 yrs	1,115	1.646	1.325
More than 1 child measured for hemoglobin	1,115	0.444	0.497

Note: Summary statistics exclude households in which the respondents reported that someone other than the husband, wife, or both made the production and consumption decisions

Figure C.1. Who decides and type, disaggregated by sex of respondent
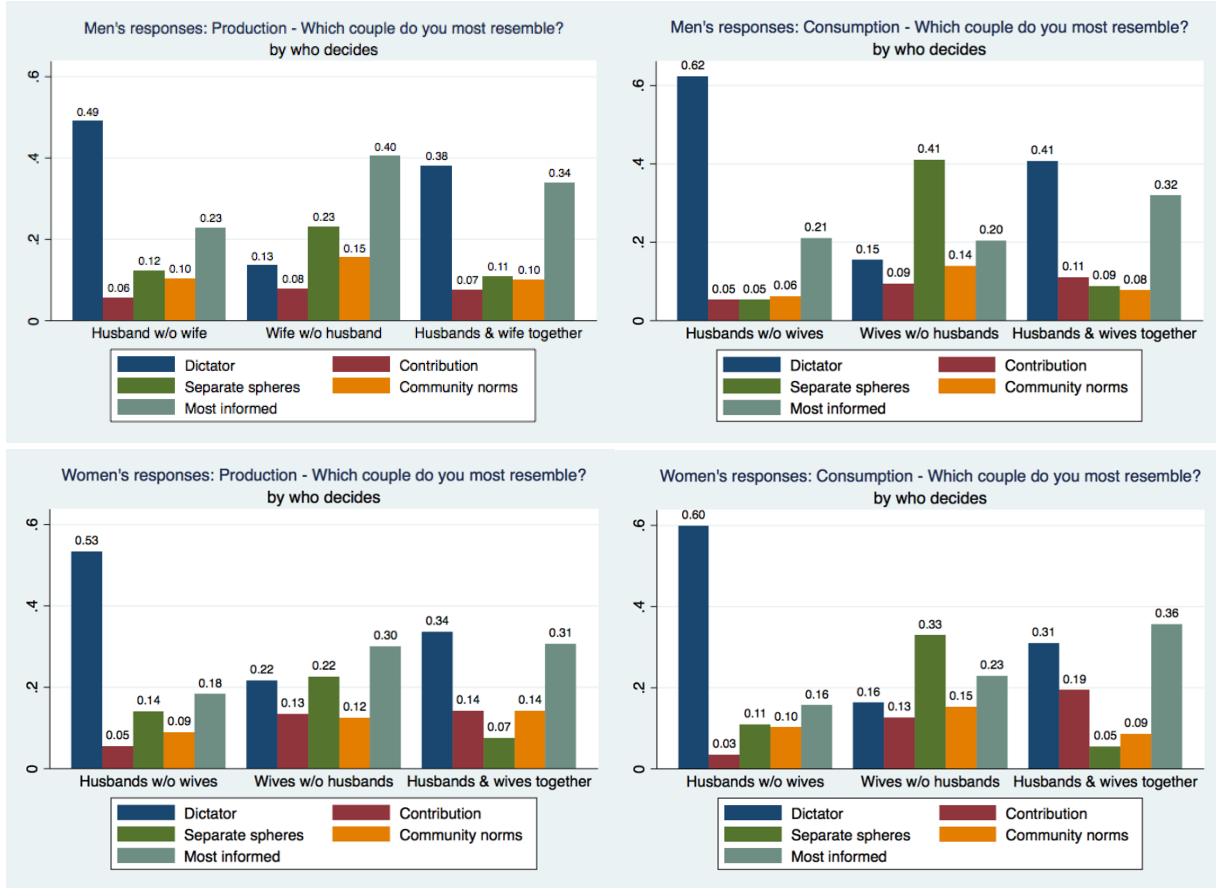
Table C.2: Number of observations across categories - Production Vignettes

	Husband w/o wife/wives	Wife/wives w/o husband	Husband & wife/wives together	Other	N
All respondents					
Dictator	323	33	91	5	452
Contribution	35	20	28	1	84
Separate spheres	83	39	23	3	148
Norms	60	23	31	1	115
Most informed	129	57	82	3	271
N	630	172	255	13	1,070
Male respondents					
Dictator	148	7	46	1	202
Contribution	17	4	9	0	30
Separate spheres	37	12	13	1	63
Norms	31	8	12	0	51
Most informed	69	21	41	1	132
N	302	52	121	3	478
Female respondents					
Dictator	175	26	45	4	250
Contribution	18	16	19	1	54
Separate spheres	46	27	10	2	85
Norms	29	15	19	1	64
Most informed	60	36	41	2	139
N	328	120	134	10	592

Table C.3: Number of observations across categories - Consumption Vignettes

	Husband w/o wife/wives	Wife/wives w/o husband	Husband & wife/wives together	Other	N
All respondents					
Dictator	159	90	77	4	330
Contribution	11	63	35	9	118
Separate spheres	22	208	15	3	248
Norms	22	83	18	0	123
Most informed	47	123	75	1	246
N	261	567	220	17	1,065
Male respondents					
Dictator	71	41	37	1	150
Contribution	6	25	10	2	43
Separate spheres	6	109	8	1	124
Norms	7	37	7	0	51
Most informed	24	54	29	0	107
N	114	266	91	4	475
Female respondents					
Dictator	88	49	40	3	180
Contribution	5	38	25	7	75
Separate spheres	16	99	7	2	124
Norms	15	46	11	0	72
Most informed	23	69	46	1	139
N	147	301	129	13	590

Table C.4: Who decides, Men's responses

	Production		Consumption	
	Best production decision for household	Standardized weekly milk output (L) per cow	Best consumption decision for household	Standardized hemoglobin per child 12-71 months
Husband without wife	-0.00	0.14	0.01	0.08
	(0.03)	(0.09)	(0.05)	(0.17)
Wife without husband	-0.04	0.13	-0.04	0.25
	(0.05)	(0.13)	(0.04)	(0.15)
N	467	467	462	345
R^2		0.07		0.03

Omitted category is husband and wife deciding together.
Standard errors in parenthesis clustered at the household level. * p<0.1 ** p<0.05; *** p<0.01

Table C.5: Who decides, Women's responses

	Production		Consumption	
	Best production decision for household	Standardized weekly milk output (L) per cow	Best consumption decision for household	Standardized hemoglobin per child 12-71 months
Husband without wife	0.02	-0.02	-0.05	0.42
	(0.04)	(0.11)	(0.04)	(0.14)***
Wife without husband	-0.04	-0.17	-0.01	0.38
	(0.05)	(0.09)*	(0.04)	(0.13)***
N	575	576	571	443
R^2		0.05		0.04

Omitted category is husband and wife deciding together.
Standard errors in parenthesis clustered at the household level. * p<0.1 ** p<0.05; *** p<0.01

Table C.6: Who decides and type, Men's responses

	Production		Consumption	
	Best production decision for household	Standardized weekly milk output (L) per cow	Best consumption decision for household	Standardized hemoglobin per child 12-71 months
Husband without wife	-0.00	0.16	0.02	0.15
	(0.03)	(0.09)*	(0.05)	(0.17)
Wife without husband	-0.03	0.09	-0.05	0.12
	(0.05)	(0.13)	(0.04)	(0.16)
Dictator	0.01	-0.24	-0.01	-0.20
	(0.04)	(0.12)**	(0.04)	(0.15)
Contribution	0.01	-0.17	0.01	0.27
	(0.07)	(0.16)	(0.06)	(0.18)
Separate spheres	-0.06	-0.07	0.05	0.17
	(0.05)	(0.17)	(0.05)	(0.18)
Norms	-0.06	-0.39	-0.07	0.24
	(0.05)	(0.13)***	(0.05)	(0.20)
N	467	467	462	345
R^2		0.09		0.05

Omitted who category is husband and wife deciding together and omitted type is most informed
Standard errors in parenthesis clustered at the household level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$

Table C.7: Who decides and type, Women's responses

	Production		Consumption	
	Best production decision for household	Standardized weekly milk output (L) per cow	Best consumption decision for household	Standardized hemoglobin per child 12-71 months
Husband without wife	0.00	0.01	-0.07	0.48
	(0.04)	(0.12)	(0.05)	(0.15)***
Wife without husband	-0.02	-0.18	-0.02	0.41
	(0.05)	(0.09)*	(0.04)	(0.13)***
Dictator	0.02	-0.14	-0.03	-0.19
	(0.04)	(0.10)	(0.05)	(0.13)
Contribution	-0.14	0.10	-0.14	-0.05
	(0.05)***	(0.27)	(0.05)***	(0.16)
Separate spheres	-0.09	-0.10	0.01	-0.20
	(0.05)*	(0.11)	(0.05)	(0.15)
Norms	-0.03	-0.37	-0.06	0.02
	(0.05)	(0.10)***	(0.06)	(0.15)
N	575	576	571	443
R^2		0.07		0.05

Omitted who category is husband and wife deciding together and omitted type is most informed
Standard errors in parenthesis clustered at the household level. * $p<0.1$ ** $p<0.05$; *** $p<0.01$