Spousal Accord and the Costs of Household Decision-making in Tanzania and Mali

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Abstract

This paper examines husband and wife perspectives on the division of authority over agriculture-related decision-making within households in Tanzania and Mali. We develop a theoretical model of intra-household "accord," defined as the level of agreement between husbands and wives over who holds authority for different decisions. We then empirically analyze husband and wife claims to authority over thirteen household farming decisions, explaining accord as a function of household characteristics and decision characteristics. We posit that lower transaction costs (in terms of negotiation and enforcement costs) make property rights over some decisions relatively more secure, resulting in greater accord over household authority for those decisions. We test our theoretical model using survey data from a stratified random sample of 3,763 households in Mali (n = 1,766) and Tanzania (n = 1,997). Cluster analysis and binary logistic regression suggest that variation in intra-household accord can be explained by both household characteristics (including individual spousal attitudes, relative spousal assets, and overall household resources) and by decision characteristics (such as whether the benefits of a given decision accrue to the individual spouse or to the household as a whole). Furthermore patterns of intra-household accord and predictors of intra-household accord both vary significantly by country (Mali versus Tanzania), but are consistent with the interpretation that cultural norms might lower decision-related transaction costs leading to efficient, if not necessarily equitable, household decision-making processes.

Keywords: Mali; Tanzania; Farm decision-making; Household survey; Husbands/wives

1. Introduction

This paper assesses the relationship between husband and wife agreement over the distribution of decision-making authority in the household and the relative transaction costs of thirteen different household and farming decisions. Increasing women's access to economic resources and decision-making power has become a popular guiding principle among international development organizations. Given known differences in preferences and access to resources and information across husbands and wives, however, attempts to unilaterally increase the self-perceived decision-making authority of women may not have the desired effects (Ashraf 2009, Fletschner et. al. 2010). More generally, any targeted interventions that increase the probability of intra-household discord over decision-making authority may result in duplicative or insufficient decision-making efforts, or in conflict. Accordingly, we seek to understand the household and decision characteristics associated with accord over decision-making authority.

We contribute to the literature on intra-household decision-making in two substantial ways. First, existing empirical work is largely restricted to a single spouse's account of decision-making authority and assumes the reported division of authority is understood by both spouses. Yet there is ample reason to believe discrepancies between husband and wife reports of household matters may be large (Jejeebhoy 2002, and Ghuman *et al.* 2004). We use an in-depth household survey based on a stratified random sample of 3,763 farm households in Mali and Tanzania that asks the same questions of both the head of household and the spouse separately.[5] This allows us to examine both husband and wife claims to decision-making authority and the incidence of accord and discord over those claims.

Second, the existing literature largely often views decision-making authority solely as a function of household characteristics, such as spousal age and education. But this cannot explain situations where decision-making authority within a single household varies across different decisions, a situation that the empirical literature in agriculture indicates is quite common. We seek to resolve this paradox by developing and testing a property rights theory of decision-making that includes both the characteristics of decision-makers as well as characteristics of the decisions themselves. We posit that the lower the negotiating and monitoring costs of a decision, ceteris paribus, the more complete the property rights

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[5] Data for the study were collected as a part of the 2010 Farmer Focus survey conducted by the Agricultural Development Initiative of the Bill & Melinda Gates Foundation

over decision-making authority and hence the higher the probability of spousal accord. This theory replaces ex-poste explanations for differential decision-making control as falling into "men's" or "women's" decision domains. Rather, "domains" are determined by transaction costs that vary according to both household characteristics and the nature of the decision.

In the next section the paper briefly motivates the importance of intra household accord with a focus on the literature on decision-making authority in developing countries, as the broader literature has been reviewed elsewhere. In section 3 we propose a property rights/transaction cost framework to explain, for a given husband-wife couple, variation in mutual understanding of decision-making authority across different types of decisions. Section 4 describes our methods, and section 5 follows by testing the theoretical model for 3,446 couples in Mali and Tanzania across 13 different agricultural and household decisions. Section 6 concludes.

2. The Importance of Decision-making Authority

Previous research has highlighted a link between increased decision-making authority and increased health and well-being among women. Indeed, since the 1980s the concept of women's status has been expanded from encompassing women's education and socio-economic status alone to explicitly include women's access to and control over resources and decision-making power within the household (Malhotra *et al.* 2002, Mason 1986).[6] The relationship between intra-household decision-making authority and positive outcomes for women has been observed in many different cultural and economic contexts. In India, for example, women's authority relative to their husbands has been shown to be related to increased use of modern contraception and to declines in infant and child mortality (Jejeebhoy 2002). Similar relationships have been observed in Latin America (Becker *et al*. 2006), and even in a limited number of studies conducted in Africa (e.g., in Egypt (Kishor 2000), and Mali (Castle 1993)). Doepke and Tertilt (2011) contain a recent review of empirical work tying women's empowerment to improved child outcomes.

While much of the empirical work in development economics on intra-household decision-making has focused on the resource allocation implications of decision-making authority, a considerable literature

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[6] Malhotra et al. (2002) define women's empowerment as a process including increased mobility, access to and control over economic resources and domestic decision-making.

has also been concerned with identifying predictors of bargaining power, including women's financial assets (for example, Doss, 2006 and Quisumbing, 2003), the value of their outside options (Rubalcave and Thomas, 2000) or their political assets (Chattopadhyay and Duflo, 2004) . But women's relative assets alone cannot explain cases where patterns of decision-making authority between the same couple vary over different <u>types</u> of decisions. There is thus the possibility that previous studies focusing on predicting spousal decision-making authority as a function of spousal characteristics may have overlooked meaningful variation in spousal decision-making authority across different decisions themselves.

Furthermore, the majority of past studies on women's decision-making authority have relied on self-reports of decision-making authority from a single spouse alone – ignoring the possibility that husbands or wives may or may not agree with the other spouse's assessment of intra-household decision-making authority. This lack of information on spouses' relative dispositions towards household decisions may be a serious weakness of past studies, since ultimately household outcomes depend on decisions made by two individuals who may agree or disagree on any specific course of action. There is ample reason to believe discrepancies between husband and wife reports of household matters may be quite large: in a study of couples in Tamil Nadu and Uttar Pradesh, India for example, Jejeebhoy (2002) finds husbands and wives differ widely in assessments of the woman's level of mobility, her access to economic resources, and her decision-making power. Indeed, with regards to the wife's involvement in purchase of food, purchase of major household items, and purchase of jewelry the spouses gave inconsistent reports in as many as 50% of couples. Ghuman *et al.* (2004) analyze similar survey data from India, Pakistan, Thailand, Philippines, and Malaysia, ultimately concluding that men and women not only differ in their assessments of women's decision-making authority, but in some cases even have different cognitive understandings of the questions, differentiating between "having final say" and "having input" in very different ways. Such findings imply large biases may be present in the results of surveys that only interview one or the other spouse.

This paper attempts to overcome the theoretical and methodological limitations of previous studies of household decision-making by developing a framework of household accord (agreement between husbands and wives over who holds decision-making authority) as a function of decision-specific

transaction costs, and then testing this model using both household characteristics and decision characteristics as covariates.

3. Intra-household Accord, Property Rights and Transaction Costs

Decision making authority over choices that affect household resource flows is a valuable property right. If spousal preferences are the same and resource constraints are the same (i.e. a unitary household model), it does not matter who holds these valuable decision-making rights - decision-making is most efficient through specialization according to who is the lowest cost decision maker. Growing challenges to the unitary household model of decision making, however, cite evidence that households do not fully pool income, and that spousal preferences are not homogeneous (e.g. Hoddinott and Haddad, 1995; Lundberg, Pollack and Wales, 1997; Duflo and Udry, 2004).

Cooperative and non-cooperative bargaining models offer alternative characterizations that are argued to better reflect the empirical evidence than a unitary household model. One difference in these two models is the stability of the bargaining outcome. Cooperative outcomes rely on an external mechanism, such as the threat of spousal sanctions through divorce (McElroy and Horny 1981; Manser and Brown, 1980), or non-cooperation within marriage (Lundberg and Pollak, 1993; Kanbur and Haddad, 1994; Konrad and Lommerud 2000; Chen and Woolley, 2001). Non-cooperative models lead to a self-enforcing Nash equilibrium, which may or may not be Pareto efficient (Lundberg and Pollack, 1994).[7] Regardless, translating these theoretical findings to policy assumes that the end game is understood by both spouses, and ultimately adhered to.

Our evidence, however, suggests the possibility of multiple cases where spouses perceive different bargaining outcomes, suggesting the absence of an equilibrium; that is, property rights over decision-making authority are incompletely defined. Further, cases of accord and discord over decision-making authority also vary across decisions for the same couple, hence household characteristics alone are unlikely to explain variations in decision-making authority. We suggest that understanding the transaction costs of negotiating who has decision-making authority can explain the probability of reaching an agreed-upon allocation.

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[7] Because household decisions are often repeated, one criticism of non-cooperative models is that a cooperative outcome should evolve – that is, spouses should "figure out" how to arrive at optimal solutions, especially for providing household public goods. Evidence, however, suggests the contrary (Western Pastoral paper, cite others), perhaps because the degree of private appropriability ("publicness") is a continuum that varies with access to, value of, and the opportunity cost of one's own contribution to the public good.

Following Figure 1, assume that husbands and wives engage in either a cooperative or non-cooperative bargaining game over rights to decision-making authority. At that point, we measure a couple's understanding of how decision making authority has been allocated as either accord (each agrees) or discord (they do not agree). In either case, decision-making authority may rest with the husband, wife, or be shared. But with intra-household accord, both have a common understanding of rights to the decision-making authority, which may represent a Pareto or Nash equilibrium. If spousal preferences are homogenous (i.e. a unitary household model), accord is a given. If spousal preferences differ but the couple lives in a zero transaction cost world, then by the Coase theorem perfectly defined property rights over decision-authority can still lead, through bargaining, to accord. The socially optimal outcome will result regardless of who has rights to the decision-making authority, though the distribution of the gains from that authority will be affected. So in either the unitary household model or zero transaction cost world, we expect accord to emerge.

Figure 1. Conceptual Model
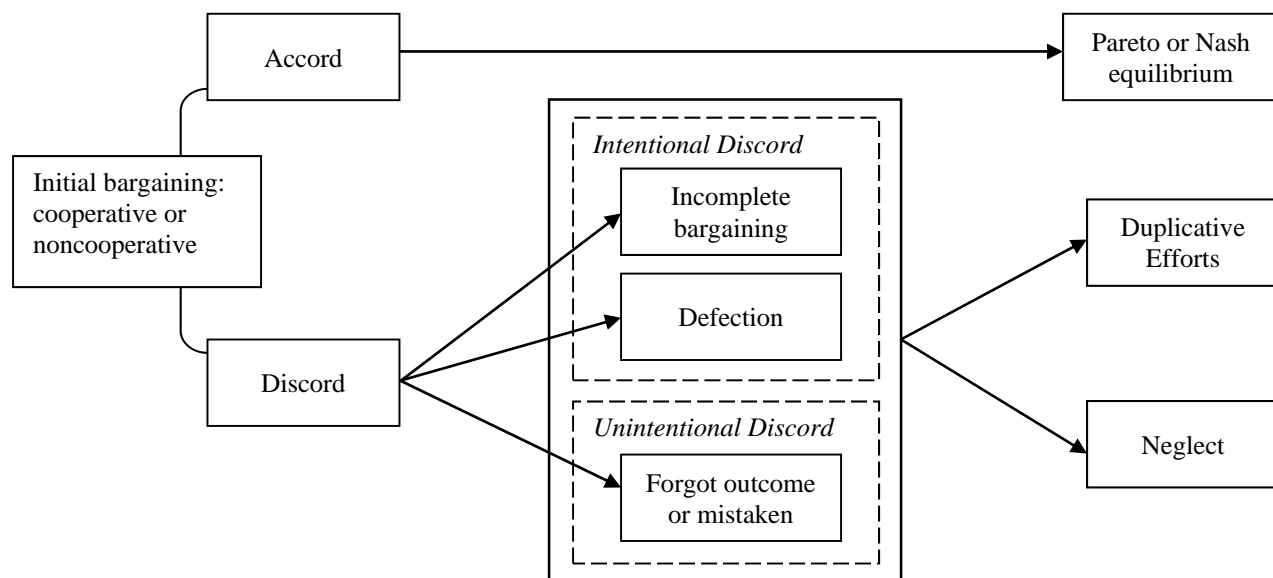
Discord, on the other hand, can be either intentional (incomplete bargaining or defection) or unintentional (misunderstanding or recall leading to duplicative or neglected efforts). Incomplete bargaining indicates that an outcome has not yet emerged (*ex ante* decision and negotiating costs are too high); defect implies that a cooperative outcome is intentionally being ignored (*ex poste* bargaining or enforcement costs of spousal behavior are too high). Alternatively, spouses are engaged in a non-

cooperative game, but with an incorrect understanding of the behavior of their spouse (information costs on spousal behavior are too high). In either case – intentional or unintentional – discord implies imperfectly defined property rights over decision-making, where the complete assignment of rights is precluded by positive transaction costs of defining and negotiating, or monitoring and enforcing a decision.

With defection, spouses may both assume decision-making authority (not jointly, but rather exercising their different preferences) and efforts are duplicative, or they may both abstain from that authority and decisions are neglected. We assume, though do not test, that either is an inefficient outcome. The result of unintentional discord, when a spouse either does not recall or understand the bargaining outcome or incorrectly assesses spousal actions in formulating his or her Nash strategy, is also that both individuals will assume decision-making authority, or that neither will. Once again we assume that this is an inefficient outcome. To the extent that unintentional discord creates less intra-household conflict than intentional discord, we see this as the most likely difference between the two discordant outcomes.

Transaction costs in determining decision making authority between a couple involve the *ex ante* costs of defining what decision has to be made and when, and negotiating who has what authority over the decision, which we group together as negotiating costs. There are also *ex post* costs of monitoring and enforcing the authority, which we group together as monitoring costs. The extent to which negotiating and monitoring costs prevent full property rights over decision making authority and hence contribute intentional or unintentional discord will vary with the characteristics of the individuals and household, and the decision itself.

Negotiating costs are predicted to vary with the size and distribution of the expected benefits and costs and of the outcome. Hence in general, we expect higher negotiating costs over decisions involving more private goods (e.g. cash) relative to public household goods (e.g. food), though in the case of public goods, differing preferences and risk attitudes can contribute to the costs of deciding who exercises authority. Hence negotiating costs are predicted to decrease with repeated or familiar decisions and rise with spousal risk and value differences over the decision outcome, and the uncertainty and magnitude of that outcome (Williamson, 1981). For a small farm household contemplating whether to plant a traditional or improved variety seed, for example, the decision entails search and information costs, or experience and knowledge, about the seed choice set. Risk perceptions will be affected by familiarity

with and affect for the seed, the proportion of farm output the crop represents, and risk attitudes. Additionally, the number of potential decision-makers with heterogeneous preferences (generally just the husband and wife although multiple wives in polygamous households and the presence of other senior males in some households) increases negotiating costs.

Negotiating who has the authority to make a decision depends on the informal governance structure of the household and culture. Williamson has suggested that the choice of governance structure minimizes transaction costs from asset specificity, opportunism and risk preference.[8] We reject the assumption of necessarily efficient evolved governing structures, noting that prejudice, bias, and social norms that favor certain groups at the expense of the whole can lead to non-efficient outcomes (one need only look at statistics on domestic violence and government corruption to question a premise that only efficient transaction-cost-minimizing governance structures endure). We do agree, however, that accepted hierarchy (generally meaning that the male claims all decision-making authority) likely has lower negotiating costs than a hybrid governance structure (in which the husband and wife each exercises authority over different types of decisions). Social norms can facilitate a "focal-point equilibrium" as observed by Kreps (1990) and noted in the marriage context by Lundberg and Pollak (1993, 1996). In hybrid structures, if one assumes that the husband is initially endowed with all decision-making authority, negotiating costs rise with the wife's asset specificity (education, skills and reproductive capabilities) that increase her options exiting the marriage.

Monitoring decision making authority depends on the visibility and frequency of the decision process and outcome. Spousal distance, either physically or culturally via segregating family or cultural norms, raises the cost of knowing each other's behavior (leading to an increased probability of unintentional discord) or monitoring and enforcing agreements (increasing the probability of intentional discord). For a husband who migrates and leaves the wife to plant the field, the costs of assessing whether a traditional or improved variety seed have been planted are relatively high. Infrequent decisions reduce the opportunity to check on shared understanding or compliance. For example, planting is a relatively infrequent decision relative to deciding daily whether or not to send the children to school. Durable purchases such as equipment tend to be more visible and less frequent than food purchases.

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[8] "The partner with the bargaining power should have an advantage in minimizing both ex ante and ex post costs of contracting via dominance in negotiation." Mernili, p.49

Hence we are arguing that decision-making authority, and accord over that authority, is driven by more than household characteristics alone. Rather, the probability of accord depends on the base decision-making disposition of the spouses (including cultural and other norms). At the same time, for any particular decision, household characteristics will be more or less important for determining accord depending on how those characteristics mitigate the transaction costs of negotiating and monitoring authority over that decision. For decisions where negotiating costs are high (more private and/or highly valued or uncertain outcomes), household characteristics such as spousal risk and value differences, spousal asset specificity that affects exit options, and household assets that allow for the luxury of debate, are expected to matter more than for decisions where *ex ante* transaction costs are low. For decisions with high monitoring costs (i.e., harder to observe or measure outcomes), physical household characteristics, such as land size and proximity, are predicted to matter more than for decisions with low *ex poste* transaction costs.

Using this framework, we test two hypotheses:

Hypothesis 1: Decision making authority varies across decision-type for the same household

Hypothesis 2: The probability of accord is higher for decisions with low transaction costs

4. Methods

Data are drawn from an in-depth household survey based on a stratified random sample of 3,763 households in 129 districts in Mali (n = 1,766) and Tanzania (n = 1,997)[9]. The survey focused on "smallholders," defined as farmers holding less than 20 acres. A standard questionnaire using local enumerators gathered information on household characteristics including demographics of all household members and detailed information on farming practices. A total of 3,446 surveys included responses from husband-wife pairs (the remaining households either had no spouse present or no spousal interview completed). Sample characteristics are provided in *Table 1*.

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[9] Data for the study were collected as a part of the 2010 Farmer Focus survey conducted by the Agricultural Development Program of the Bill & Melinda Gates Foundation

Table 1. Characteristics of the Mali and Tanzania samples.

	Mali	Tanzania
Households	1,766	1,997
Households with spousal interview	1,595	1,851
Districts	27	102
Primary crops	Millet/Sorghum, Groundnuts, Maize, Beans	Maize, Beans, Cassava, Rice

The objectives of the survey were to understand how farmers could be segmented for agricultural extension based on their psychographic characteristics, and to help create agricultural development interventions that incorporate the underlying motivations of farmers. The head of household answered all questions in the survey, while spouses separately answered a subset of personal information, attitudes and opinion questions.[10]

The 13 decision variables considered in this study range from very general, e.g. who holds overall decision-making authority for the farm, to more specific responsibilities, e.g. who decides when and where to sell cattle or cash crops. Each respondent was asked to allocate 10 beans between the husband and wife to reflect each individual's relative decision-making power in a specific domain. Questions were worded as follows:

> *Thinking of yourself and your spouse, how is household decision-making shared between the two? I am giving you 10 beans and I want you to share them between yourself and your spouse according to the power each has in making the decision.*
> - *What happens in the farm generally?*
> - *What crops to cultivate in the farm?*
> - *Where to sell cash crops?*
> - *How to spend cash from sale of cash crops?*
> - *What foods to feed the family?*
> - *When to sell off livestock?*
> - *How to spend cash from sale of livestock?*
> - *Whether to send children to school?*
> - *Whether to buy new high yielding seed variety or use the ordinary seeds?*
> - *Whether to buy new farm equipment or stay with the old tools?*
> - *Who to attend farm training?*
> - *What type of information or training the household needs?*
> - *Overall decision making for the household?*

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[10] Farmer Focus Pre-Read Draft, 2011, p. 11

Husbands and wives were interviewed separately to ensure spouses did not influence each other's bean allocations. Each respondent was also required to allocate all 10 beans between him or herself and the spouse. For example, if the husband assigned himself 7 beans for authority over what happens on the farm generally, he had to assign the remaining 3 beans to his wife. Third-party decision-makers, e.g., in-laws, brothers, etc., were not eligible for consideration. Alternately, the respondent could state that the decision was not applicable for their household at all (e.g., for households with no livestock certain livestock-related decisions might not apply). This resulted in a code of N/A for both husband and wife decision-making power.

5. Empirical Results

Figures 2-5 summarize average responses to decision-making questions by country and gender. With the exception of what foods to feed the family, on average nearly all of the decision-making variables appear to fall largely in the domain of the husband. Consistent with expectations, however, men in Tanzania were substantially more likely to allocate more beans to women than were husbands in Malian households.

At first glance men's and women's reports of decision-making authority within each country appear surprisingly consistent – the difference in average reports by men and the average reports by women rarely approaches even one half of one bean, and some means are nearly identical. That said, there are some noteworthy characteristics of this aggregated data. There is little evidence of women under-reporting their decision-making authority (relative to husbands' reports) in either country. Women's under-reporting of their own authority is a pattern that has been noted in numerous past quantitative and qualitative studies (Becker *et al*. 2006). Here, on the contrary, in Mali we see the opposite pattern emerge – wives slightly over-reporting their decision-making authority relative to the authority ascribed to them by their husbands – although the differences are relatively small. More consistent with previous research, the figures highlight one domain where women have more authority than other domains – what foods to feed the family. Even for this decision, however, wives do not have more authority than men, and at most are perceived to share it equally.

Figure 2. Beans allocated to men (Mali)
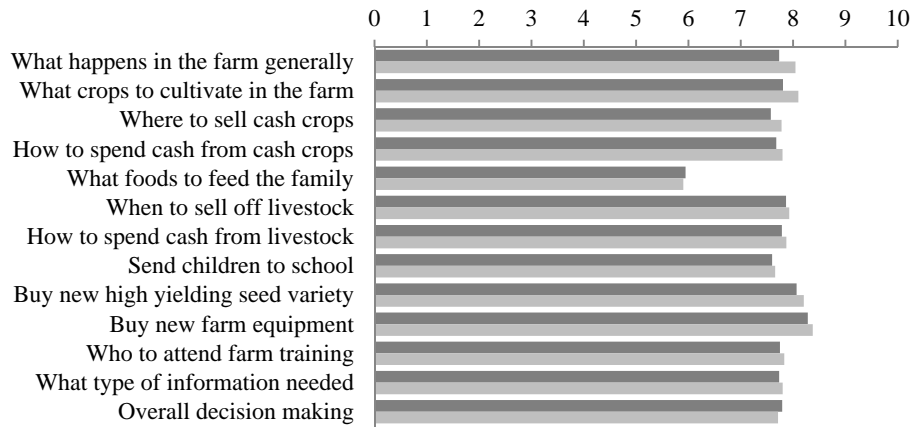
Figure 3. Beans allocated to women (Mali)
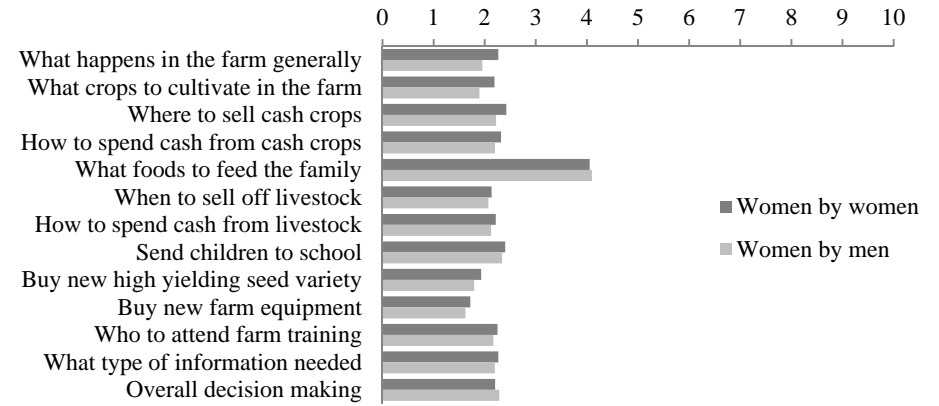
Figure 4. Beans allocated to men (Tanzania)
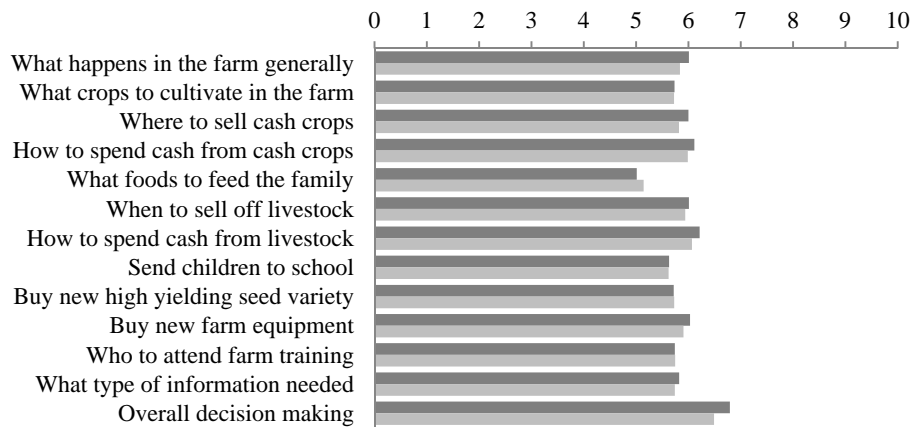
Figure 5. Beans allocated to women (Tanzania)
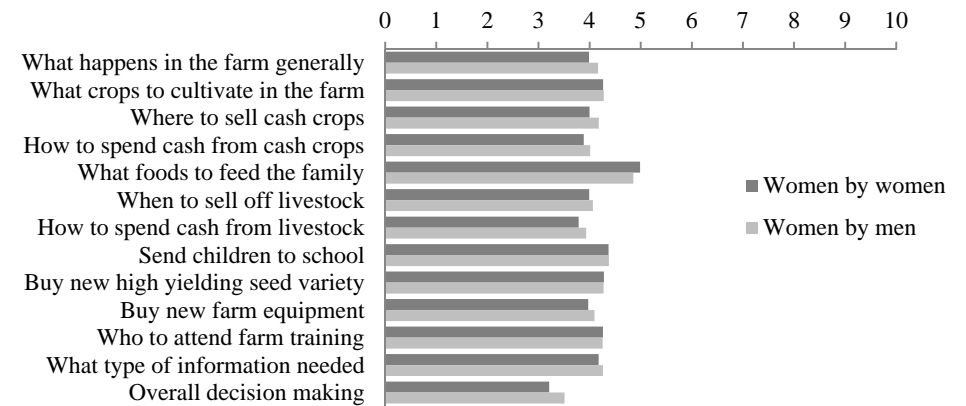
5.1. Spousal Decision-Making Dispositions

Hypothesis 1: Decision making authority varies across decision-type for the same household

Thus far, the preferences of the decision-makers have been assumed to be either common or not, with bargaining power driven by assets or "threat" options. But arguably individuals may also vary in their taste for decision-making authority, in their willingness to engage in non-cooperative games, or in their basic competitive versus consultative disposition. Though some "disposition" may be driven by age, education, asset or other differential, and conditioned by the individual's value of authority in any particular domain, basic differences will affect the bargaining outcome. Though we cannot measure these base dispositions in the absence of external influences, we use responses to these 13 questions to classify individual decision-making dispositions on a scale ranging from "autocratic" (where the individual feels he or she has primary authority over all decisions in the household) to "abstaining" (where the individual defers to the spouse for all decisions).

The authority to make decisions about matters of importance to the farm and/or household may reside entirely with one or the other spouse or, in other cases, will be shared by both husband and wife. Broadly, we can characterize a given individual household member in terms of how he or she approaches decisions (i) in his or her own domains, and (ii) in the domains of the spouse. An individual's domain (cropping decisions, marketing decisions, nutrition decisions, etc.) is self-identified as any decision in which they claim the majority of decision-making authority. For example, an individual might claim authority over all decisions, regardless of the views of the spouse, as in the case of an autocratic head-of-household in a strongly male-dominated society. Alternately, an individual might claim some degree of authority in some domains, but defer to the spouse for decisions in others – the husband might claim authority over marketing, for example, but cede household nutrition decisions to his wife. This represents a case of specialized decision-making. In yet another case, an individual might make decisions jointly with the spouse, sharing authority over some or all domains. Finally, it is also possible that an individual might defer to the spouse in some or all decisions – in extreme cases abstaining from the decision-making process altogether.

There are three spousal dispositions where decision-making authority is invariant to the particular decision, including: Autocratic (all decisions are taken by one spouse); Joint (all decisions are shared); and Abstaining (authority on all decisions is deferred). Households where decision making authority varies across decisions are: Dominant, Specialized, and Subordinate. If Hypothesis 1 is false, all individuals would characterize themselves as either autocratic, joint or abstaining. Table 2 indicates, however, that the majority of individuals characterize themselves as having differing levels of authority across decisions, particularly in Tanzania. Three-quarters of husbands claim different levels of authority across different domains, and over two thirds of wives.

Table 2. **Percent Decision Making Dispositions (3,446 couples)**

	Mali	Tanzania	Total
Husbands			
Autocratic	29.4	1.0	14.3
Joint	9.0	15.6	12.5
Abstaining	0.3	0.3	0.3
Total Invariant by Decision			*27.1*
Dominant	66.2	50.4	42.6
Specialized	24.0	28.5	26.4
Subordinate	0.6	4.2	2.5
Total Varying by Decision			*71.5*
Wives			
Autocratic	0.3	0.1	0.2
Joint	7.7	6.2	6.9
Abstaining	21.7	0.5	10.5
Total Invariant by Decision			*17.6*
Dominant	0.2	3.5	1.9
Specialized	20.8	31.5	26.5
Subordinate	27.6	50.9	40.0
Total Varying by Decision			*68.4*

Looking across responses to all 13 decision variables the most common decision-making disposition among men in the sample was *Dominant*, with 43% of husbands reporting they hold exclusive authority over some decisions and share authority over others, but place no decisions under the exclusive domain of the wife.[11] This category was followed by *Specialized* (26%), with husbands reporting both they and their wives have their own areas of decision-making authority,

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[11] Male respondents classified as *Dominant* on average reported exclusive authority over 6.0 decisions in the household, sharing the remainder with the wife.

on average ascribing responsibility over 6.2 decisions to the husband and 1.6 decisions to the wife (and sharing the others). The remainder of men in the sample were split primarily among two categories, with 14% describing themselves as holding authority over all decisions in the household (*Autocratic*) and 13% reporting sharing all decisions with the spouse (*Joint*). These averages, however, conceal considerable cross-country variation.

Among women in the sample *Autocratic* and *Dominant* dispositions were exceedingly rare (less than 3% of women). The most common disposition was *Subordinate*, with 40% of women reporting they share in some household decisions and defer all others to their husbands. An additional 27% of women fell into the *Specialized* category – reporting an average of 1.7 domains over which they held decision-making authority, and 5.9 over which the husband held authority. 11% of women were classified as *Abstaining*, deferring to their husband's authority on all decisions in the survey. Only 258 women – 7% of the sample – reported sharing all decisions jointly with their spouse (*Joint*).

5.2. Spousal Accord: Husband and Wife Decision-making

Testing for accord, rather than simply decision-making by gender, requires matching husband and wife responses to the same household. We begin by looking at the probability of intra-household accord by characterizing the general confluence of husband and wife decision-making dispositions. Households where both husband and wife were specialized or joint decision-makers were coded as compatible (ACCORD), as were households with one autocratic and one abstaining spouse, or one dominant and one subordinate spouse. Other households were coded as incompatible, either due to DISCORD (e.g., when both spouses were dominant or autocratic, competing for authority), SOME DISCORD (e.g., when one spouse was dominant and the other spouse was joint, suggesting one spouse claimed authority while the other expected to share it), or due to INDECISION (e.g., where each spouse deferred to the other in some or all decisions).

Table 3 shows the relationships between husband and wife decision-making dispositions in the sample. Bold numbers represent households when husband and wife dispositions are compatible, i.e., where intra-household accord is possible. For example, in 186 households the husband felt he held decision-making authority over all household decisions (*Autocratic*) and the wife felt she

held no decision-making authority (*Abstaining*), hence the two spouses were approximately in accord on all decisions. A total of 139 *Joint-Joint* households also experience accord on all decisions (always sharing decision-making authority). On the opposite extreme, in 3 households both the husband and the wife claimed authority over all decisions (*Autocratic-Autocratic*), implying discord across all decisions. Finally, other potentially compatible husband-wife pairings such as *Dominant-Subordinate*, *Specialized-Specialized*, or *Subordinate-Dominant* could result in either accord or discord, depending on whether or not spouses agreed on the allocation of authority over specific decisions. In other words, within these households both spouses agree decision-making is shared, but they may still disagree on exactly how authority is allocated). Overall, in the table below households in red cells exhibit the presence of intra-household discord (both husband and wife claim authority over one or more decisions), orange cells include households with some discord (where one spouse claims primary authority over a decision while the other sees that decision as shared), light blue cells include households with some indecision (where one spouse thinks the other spouse is in charge of certain decisions but he or she believes decisions are shared), and the dark blue cells represent outright indecision – where each spouse assumes the other is responsible for one or more decisions.

Table 3. Intra-household decision-making dynamics

Men/Women	Autocratic	Dominant	Specialized	Joint	Subordinate	Abstaining	Men Total
Autocratic	3	1	76	31	129	**186**	*426*
Dominant	2	23	375	54	**869**	104	*1,427*
Specialized	1	26	**437**	26*	294	65	*849*
Joint	0	9	75*	**139**	174	31	*428*
Subordinate	1	**13**	27	8	34	3	*86*
Abstaining	**0**	0	1	0	1	0	*2*
Women Total	7	72	991	258	1,501	389	

*Households with one *Joint* and one *Specialized* could experience discord or indecision depending on which domains were disputed or neglected. In the sample, when the man was *Specialized* there were usually more decisions under discord than decisions under indecision, and when the man was *Joint* there were more decisions under indecision than under discord. Respondents in these categories were coded accordingly.
Red: Discord
Orange: Some discord
No Color: Accord (Autocratic, Joint, Abstaining) or Possible Accord (Dominant, Specialized, Subordinate)
Light blue: Some indecision
Blue: Indecision

As shown above the largest number of households demonstrating intra-household accord (with both husbands and wives agreeing on their decision-making roles) contained dominant husbands and subordinate wives. Other common pairings included specialized husbands and specialized wives (a compatible household) and dominant husbands and specialized wives (an incompatible household, since for at least one decision the wife feels she has primary decision-making authority, while the husband feels he has primary decision-making authority).

The largest number of households demonstrating intra-household accord (with both husbands and wives agreeing on their decision-making roles) contained dominant husbands and subordinate wives. Other common pairings included specialized husbands and specialized wives (a compatible household) and dominant husbands and specialized wives (an incompatible household, since for at least one decision the wife feels she has primary decision-making authority, while the husband feels he has primary decision-making authority).

A total of 831 households were in accord across all 13 decisions, including *Autocratic-Abstaining* and *Joint-Joint* husband-wife pairs, in addition to many *Dominant-Subordinate*, *Specialized-Specialized*, and *Subordinate-Dominant* pairs (but only where spouses both agreed on the allocation of shared authority over different decisions). Notably, over 65% of "always in accord" households were in Mali, including 185 households where the husband is autocratic and the wife abstains on all decisions. In Tanzania, only one *Autocratic-Abstaining* household was reported, implying significant cross-cultural differences in the allocation of decision-making authority.

Table 4 further summarizes differences in attributed responsibility by husbands and wives across the 13 decision variables using the general categories "husband's domain" (7 beans or more to the husband), "joint domain" (4-6 beans to each spouse) and "wife's domain" (7 beans or more to the wife). Where the husband's response is the same as the wife's response (highlighted in dark grey), differences in the allocation of authority perceived by husbands and wives in the same household were small. By far the most common disagreements between spouses were for husbands to see a decision as their exclusive domain and wives to see it as joint, or for husbands to see a decision as joint and wives to perceive it as primarily the responsibility of the husband.

Table 4. Husband and wife perceived decision-making authority

Respondent and perceived decision-making authority		Decision												
Husband	**Wife**	What happens in the farm generally	What crops to cultivate	Where to sell cash crops	How to spend cash from cash crops	What foods to feed the family	When to sell off livestock	How to spend cash from livestock	Send children to school	Buy new high-yielding seed variety	Buy new farm equipment	Who to attend farm training	What type of information needed	Overall decision-making
Husband's domain	Husband's domain	1,138	1,081	1,000	1,060	445	946	1,019	948	1,064	1,237	738	737	1,453
Husband's domain	Joint	393	401	371	382	319	331	323	382	347	387	334	345	410
Husband's domain	Wife's domain	41	49	60	42	114	45	45	33	45	21	47	41	20
Joint	Husband's domain	529	414	467	512	357	409	474	395	395	448	387	426	599
Joint	Joint	1,015	1,139	922	863	1,135	687	580	1,124	1,059	931	685	744	585
Joint	Wife's domain	41	42	44	44	250	44	38	60	61	31	64	64	20
Wife's domain	Husband's domain	15	21	44	25	126	30	24	24	18	17	38	35	32
Wife's domain	Joint	25	30	40	29	181	33	29	61	37	40	43	44	14
Wife's domain	Wife's domain	9	14	25	20	243	22	19	24	12	8	17	23	4
Total		3,206	3,191	2,973	2,977	3,170	2,547	2,551	3,051	3,038	3,120	2,353	2,459	3,137

5.2.1. Spousal Accord on Specific Decision-making Responsibilities

To analyze accord by decision, a more detailed measure of accord capturing variation in husband and wife responses to individual decision-making questions was used. ACCORD[*decision_i*] was calculated as *Husband authority [Reported by the husband for decision_i] – Husband authority [Reported by the wife for decision_i]*. Denoted H[H] – H[W] in the presentation of results below, these decision-level accord variables ranged from -10 if the husband thought a particular decision was entirely the wife's domain and the wife thought it was entirely the husband's domain (indecision on that issue), to 0 if the husband and wife agreed on who held decision-making authority, to +10 if both husband and wife thought the decision was in their own domain alone (conflict on that issue).

Though in the aggregate husband and wife attributions of decision-making authority were quite similar, there was nevertheless a great deal of variation in intra-household perspectives. *Figure 6* illustrates the distribution of intra-household accord, given by H[H] – H[W] on the single decision of what crops to cultivate in the farm (note that since all spouses were given 10 beans to allocate, it does not matter whether we use the number of beans allocated to husbands or to wives – the difference is identical).
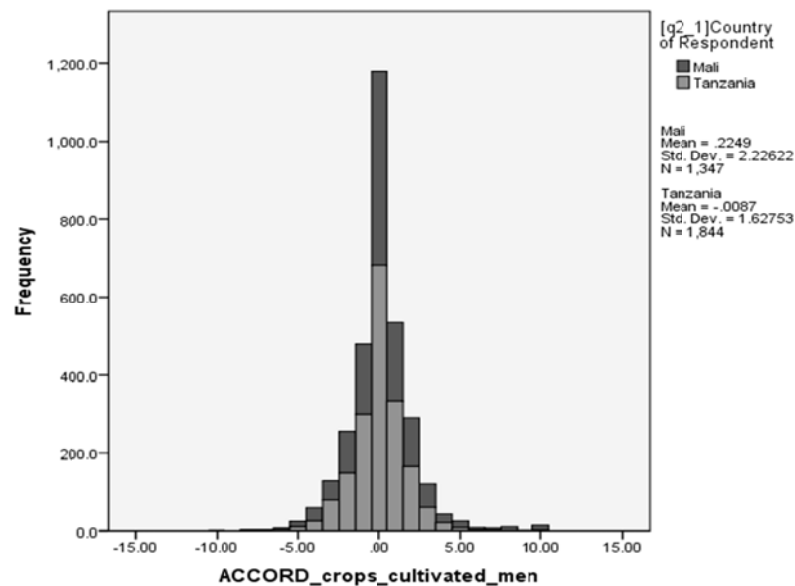
Figure 6. Intra-household accord on cropping decision responsibility

In both Tanzania and Mali the median household accord score is zero, meaning as we saw with the "Accord" households in *Table 4*, many husbands and wives agree on who holds responsibility for this decision. In Mali however the mean accord score is 0.22, suggesting on average husbands felt they held more authority over this decision than did their wives.

5.3. Characterizing Decisions

Hypothesis 2: The probability of accord is higher for decisions with low transaction costs

We cannot directly measure the transaction costs associated with 13 decisions across all households. Using principal components analysis (PCA), however, we can statistically group decisions according to similar patterns of variation across households. PCA produces (with some cross-country differences) three factors that together explain 67.0 percent of variation in Mali and 45.1 percent of variation in Tanzania. With an Eigenvalue cut-off of 1.0, we obtain three unique categories of decisions that are in many respects consistent with differences attributable to how private or public (either household or farm) the decision outcome is:

Central Farm Decisions and expenditures (farm specific)
- *What happens in the farm generally?*
- *What crops to cultivate in the farm?*
- *Whether to buy new high yielding seed variety or use the ordinary seeds?*
- *Whether to buy new farm equipment or stay with the old tools?*

Farm Revenues (private goods)
- *Where to sell cash crops?*
- *How to spend cash from sale of cash crops?*
- *When to sell off livestock?*
- *How to spend cash from sale of livestock?*

Household, Children and Labor (household public goods)
- *Whether to send children to school?*
- *Who to attend farm training?*
- *What type of information or training the household needs?*
- *What foods to feed the family?*
- *Overall decision making for the household?*

We regress the probability of accord for each household by each decision (clustering for households) controlling for other covariates available from the survey data and hypothesized to

be associated with intra-household decision-making and accord. We have grouped the covariates into individual attitudes, individual assets, and household and farm assets that include:

1. *Husband and wife attitudes*: risk attitude differences, a "willingness" index, differences in religion for Tanzania (insufficient variation across households in the Mali sample) and husband farmer satisfaction;
2. *Husband and wife specific assets*: age, education, health, labor, years farming;
3. *Household shared assets*: food security, land, improved water source, proximity to road, own transport; children, and training

Appendices I and II summarizes descriptive statistics for covariates and outcome variables for the 3,446 couples. Our results are shown in Table 5.

*Table 5.*Binary logistic regression predicting accord for decisions as a function of household characteristics and decision characteristics

	Mali				Tanzania			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Decision Type:	*All*	*Farm*	*Cash*	*Household*	*All*	*Farm*	*Cash*	*Household*
(outcome is accord = 1)								
same_religion	.	.	.	.	0.111*	0.136	0.157**	0.055
risk_diff	0.027	0.0340	0.009	0.036	-0.064***	-0.053**	-0.091***	-0.051**
farming_satisfaction	0.091***	0.090**	0.173***	0.034	0.045**	0.041*	0.031	0.059***
willingness_husband	-0.005	-0.001	-0.004	-0.008**	-0.001	-0.001	-0.001	-0.001
willingness_wife	0.013***	0.008*	0.012***	0.018***	0.006***	0.003	0.007***	0.007***
education_husband	0.073***	0.087***	0.072***	0.063***	-0.017	0.015	0.015	-0.070
age_husband	-0.012**	-0.010	-0.015**	-0.012**	-0.002	0.004	-0.014**	0.001
health_husband	-0.127**	-0.152**	-0.169**	-0.074	-0.038	-0.061	-0.048	-0.010
labor_husband	0.007	-0.003	0.022	0.004	-0.033**	-0.046**	-0.044**	-0.012
years_farming	0.007	0.004	0.004	0.012**	-0.005	-0.010**	0.002	-0.006*
community_standing	0.004	0.044	-0.000	-0.027	0.005	-0.010	-0.000	0.023
training	-0.143	-0.239**	-0.099	-0.096	0.008	0.052	-0.079	0.038
education_wife	-0.007	-0.003	-0.027	0.004	0.101**	0.099*	0.068	0.130***
age_wife	-0.006	-0.012**	-0.002	-0.004	0.008*	0.005	0.012**	0.006
health_wife	-0.022	-0.039	-0.028	-0.003	0.056	0.077	0.024	0.065
labor_wife	0.047**	0.029	0.059**	0.055***	0.005	-0.003	-0.004	0.020
any_children_under_10	-0.274***	-0.347***	-0.176	-0.291***	0.099	0.059	0.082	0.148**
land_cultivated	-0.023***	-0.030***	-0.027***	-0.014*	0.010**	0.013**	0.011**	0.006
food_secure	0.096	-0.059	0.141	0.194*	-0.342***	-0.428***	-0.206***	-0.377***
distance_pavement	0.005**	0.002	0.005	0.008***	0.001**	0.001	0.002**	0.001
own_transport	0.065	0.072	0.035	0.085	-0.188	-0.391**	-0.061	-0.128
improved_water	0.132	0.055	0.048	0.265**	-0.237***	-0.243**	-0.130	-0.320***
asset_score	-0.003	0.000	-0.006	-0.002	0.007*	0.002	0.004	0.014***
farm generally	*[omitted]*	*[omitted]*			*[omitted]*	*[omitted]*		
new seed variety	0.319***	0.320***			-0.040	-0.040		
crops to plant	0.0310	0.0311			0.032	0.032		
new farm equipment	0.319***	0.320***			-0.040	-0.040		
cash from crop sales	-0.184**		*[omitted]*		-0.153**		*[omitted]*	
cash from livestock	-0.174**		0.00962		-0.512***		-0.360***	
where to sell crops	-0.0403		0.145**		-0.127**		0.026	
when to sell livestock	-0.165**		0.019		-0.395***		-0.242***	
foods to feed family	-0.222***			*[omitted]*	-0.202***			*[omitted]*
household overall	0.249***			0.474***	-0.234***			-0.032
schooling children	0.199**			0.423***	0.072			0.275***
type of information	-0.189**			0.034	-0.319***			-0.117*
who attends training	-0.213**			0.010	-0.479***			-0.277***
Constant	-0.251	0.364	-0.255	-1.138**	-1.329***	-0.973**	-1.092**	-2.149***
Observations (Household x Questions)	13,806	4,248	4,248	5,310	23,101	7,108	7,108	8,885

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

These results support the earlier findings that the probability of accord varies by decision, after controlling for household characteristics (Hypothesis 1). In Mali, the wife's willingness to experiment, husband's education, husband's youth and wife's labor are all associated with a higher probability of accord. Better health, young children, and a larger area cultivated were negatively associated with the probability of accord. The education and health of the wife are unimportant, perhaps suggesting that strong social norms drive household bargaining, and reflecting the predominance of autocratic husbands and abstaining wives.

In Tanzania, differences in risk attitudes between the husband and wife were consistently negatively associated with the probability of accord. Food security is negatively related to the probability of accord in Tanzania, a finding that merits additional exploration. Possibly food security permits more intra-household bargaining over the control of decisions. Several variables run in the opposite direction of Mali: education and age of the wife were positively associated with accord; area cultivated tended to be positively associated with accord, and household assets are positively associated with accord in some cases.

To relate household characteristics to the transaction costs of particular decisions, we re-run the model on the probability of accord for a particular decision. We posit that spousal value and risk differences (covariate category 1) will be more important to a high risk decision such as buying new seed, than a daily schooling decision. We predict that individual spousal assets (covariate category 2) will be more important predictors of accord on decisions that involve private goods, such as spending cash, than for decisions that contain more public goods. Likewise, we posit that shared household assets (covariate category 3) will be more important predictors of accord over decisions over public farm and household goods.

We are looking for patterns in these covariate categories that are associated with the three clusters of decisions from the principal components analysis. To associate these with transaction costs, it is easiest to focus on three decisions, one from each PCA cluster. Table 6 reports the results for the probability of accord over the following three decisions:

Central Farm Decisions and expenditures (farm specific)
- *Whether to buy new high yielding seed variety or use the ordinary seeds?*

Farm Revenues (private goods)
- *How to spend cash from sale of cash crops?*

Household, Children and Labor (household public goods)
- *Whether to send children to school?*

*Table 6.*Binary logistic regression predicting accord for specific household decisions as a function of household characteristics

	Mali				**Tanzania**		
	(1)	(2)	(3)		(5)	(6)	(7)
Decision Type:	*New Seed*	*Cash*	*Schooling*		*New Seed*	*Cash*	*Schooling*
(outcome is accord = 1)							
same_religion	.	.	.		0.208*	-0.039	0.080
risk_diff	0.124**	0.011	0.052		-0.066**	-0.054	-0.039
farming_satisfaction	-0.001	-0.007	-0.013**		-0.001	-0.000	0.005
willingness_husband	0.012**	0.015**	0.025***		0.003	0.006*	0.001
willingness_wife	0.159***	0.074	0.081		0.020	0.048	0.053
education_husband	0.131***	0.110***	0.104***		0.008	-0.038	-0.103
age_husband	-0.010	-0.008	-0.019**		0.005	-0.016*	0.000
health_husband	-0.213**	-0.142	-0.155		-0.027	0.006	0.038
labor_husband	0.017	0.001	-0.041		-0.066**	-0.058**	-0.071**
years_farming	0.003	-0.006	0.019**		-0.013**	0.003	0.001
community_standing	0.027	0.014	-0.019		-0.042	-0.049	0.030
training	-0.385**	-0.181	-0.109		0.188	-0.031	-0.030
education_wife	-0.055	-0.086	-0.037		0.124	0.092	-0.025
age_wife	-0.015**	-0.007	-0.015**		0.006	0.011	-0.005
health_wife	-0.058	0.000	-0.124		0.065	-0.085	0.109
labor_wife	0.026	0.002	0.064**		0.022	0.008	0.027
any_children_under_10	-0.340**	-0.438**	-0.291*		0.029	-0.093	-0.063
land_cultivated	-0.049***	-0.032**	-0.025**		0.013**	0.006	0.015**
food_secure	0.103	0.147	0.315**		-0.573***	-0.466***	-0.454***
distance_pavement	0.005	-0.004	0.009**		0.001	0.003**	0.003**
own_transport	0.129	0.319*	0.069		-0.678***	0.064	-0.124
improved_water	0.048	-0.039	0.330**		-0.306*	-0.261	-0.188
asset_score	0.003	-0.014*	-0.007		0.001	0.003	0.007
Constant	0.856	1.147	1.068		-0.911	-0.144	-1.128*
Observations (Households)	988	912	988		1,733	1,712	1,677

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Discussion

Our primary finding is that intra-household decision making authority does not, as often presumed, simply rest entirely with the husband. Nor is it neatly divided into men's and women's domains. Rather (acknowledging differences across countries) our findings suggest that for decisions involving uncertain livelihood outcomes, the probability of accord is associated the compatibility of basic risk-taking between the husband and wife. For decisions involving the potentially private use of money, the age of the spouses – possibly reflecting their exit options, is associated with accord. And for decisions over shared household outcomes, household assets, food security and the presence of young children are important drivers.

The process of empowerment has been referred to as an ''expansion in people's ability to make strategic life choices in a context where this ability was previously denied to them'' (Kabeer 2001). It is important, however, to recognize that an uneven allocation of decision-making authority across spouses in certain domains may be more than a cultural anachronism, and also be an economically efficient use of household resources (including the time and skills of both spouses).[12]

This study has highlighted the potential perils of interviewing a single spouse to gather data on the allocation of household decision-making authority: while an individual may identify his or herself as autocratic, dominant, specialized, etc., the question of whether or not this decision-making disposition is likely to result in superior or inferior outcomes for the household relative to other households hinges critically on the disposition of the spouse. Asking both women and men to report on their spouse's decision-making authority entails significant increases in the costs and complexity of survey collection and analysis; as a consequence many past studies have relied on assumptions that individual responses can be treated as equivalent to household responses. Our study has tested such assumptions empirically, using data from husbands and wives in households in Mali (where autocratic and dominant husbands are the norm) and Tanzania (where men still hold more power in the household, but where specialized or shared decision-making is more ubiquitous) to explore the effects of varying intra-household decision-making arrangements on household innovative behavior.

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[12] There is some debate about the extent to which power for decision-making is zero-sum between actors or not (e.g. Mosedale, 2005).

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APPENDIX I - II
SUMMARY STATISTICS FOR COVARIATES

MALI   **TANZANIA**

Variable	Obs	Mean	Std. Dev.	Min	Max	Variable	Obs	Mean	Std. Dev.	Min	Max
same religion	1595	0.935	0.246	0	1	same religion	1851	0.727	0.446	0	1
risk diffference	1401	-0.128	1.317	-4	4	risk diffference	1851	0.186	1.600	-4	4
farming satisfaction	1721	1.231	1.378	-2	2	farming satisfaction	1984	0.795	1.567	-2	2
willingness score (hus)	1766	47.718	27.093	0	92.614	willingness score (hus)	1997	58.610	17.352	4.402	100
willingness score (wife)	1595	39.154	27.961	0	100	willingness score (wife)	1851	62.899	16.181	0	98.653
education (husband)	1766	2.011	1.895	1	7	education (husband)	1997	2.041	0.747	1	7
age (husband(	1766	51.092	13.977	18	85	age (husband(	1997	45.601	11.908	21	87
health (husband)	1745	3.916	0.809	1	5	health (husband)	1997	4.056	0.727	1	5
labor (husband)	1745	7.551	3.132	0	19	labor (husband)	1997	4.794	2.101	0	15
years farming	1743	36.944	14.495	2	70	years farming	1997	27.522	12.073	3	70
community standing	1672	4.748	1.703	1	10	community standing	1983	4.455	1.613	1	10
training	1743	0.258	0.437	0	1	training	1997	0.274	0.446	0	1
education (wife)	1595	1.441	1.263	1	7	education (wife)	1851	1.883	0.657	1	7
age(wife)	1595	39.702	12.407	18	84	age(wife)	1851	37.407	10.846	18	80
labor(wife)	1402	7.211	2.760	0	19	labor(wife)	1850	4.782	2.079	0	13
health(wife)	1400	3.852	0.774	1	5	health(wife)	1851	3.987	0.784	1	5
any children under 10	1766	0.666	0.472	0	1	any children under 10	1997	0.621	0.485	0	1
land cultivated	1287	7.678	6.952	0.01	65	land cultivated	1903	6.208	8.134	0.02	80
food secure	1674	0.357	0.479	0	1	food secure	1983	0.314	0.464	0	1
distance to pavement	1730	9.570	18.176	0	150	distance to pavement	1983	41.917	40.904	0	150
own transportation	1766	0.475	0.499	0	1	own transportation	1997	0.085	0.278	0	1
improved water	17	0.23	0.424	0	1	improved water	19	0.14	0.348	0	1

	Obs	Mean	Std. Dev.	Min	Max		Obs	Mean	Std. Dev.	Min	Max
asset score (HH)	6617	34.997	13.928	0	99	asset score	9719	23.506	9.039	0	100

SUMMARY STATISTICS FOR ACCORD BY QUESTION

MALI						**TANZANIA**					
Variable	Obs	Mean	Std. Dev.	Min	Max	Variable	Obs	Mean	Std. Dev.	Min	Max
acc_farm generally	1358	0.252	2.158	-10	10	acc_farm generally	1848	-0.175	1.660	-8	9
acc_crops cultivated	1347	0.225	2.226	-10	10	acc_crops cultivated	1844	-0.009	1.628	-8	10
acc_where to sell crops	1196	0.107	2.352	-10	10	acc_where to sell crops	1777	-0.187	1.867	-8	9
acc_cash spending (crops)	1193	-0.008	2.274	-10	10	acc_cash spending (crops)	1784	-0.134	1.825	-7	8
acc_food to feed family	1340	0.135	3.243	-10	10	acc_food to feed family	1830	0.128	2.101	-7	8
acc_when to sell livestock	1103	0.017	2.344	-10	10	acc_when to sell livestock	1444	-0.096	1.920	-9	9
acc_cash spending (livestock)	1108	0.010	2.344	-10	10	acc_cash spending (livestock)	1443	-0.150	2.046	-10	10
acc_schooling	1312	0.059	2.096	-10	10	acc_schooling	1739	-0.001	1.887	-9	9
acc_new seeds	1314	0.033	1.932	-8	10	acc_new seeds	1806	-0.131	1.683	-7	9
acc_who attends training	968	0.009	2.342	-10	10	acc_who attends training	1385	-0.022	2.281	-10	10
acc_types information needed	931	0.012	2.431	-10	10	acc_types information needed	1528	-0.122	2.078	-9	9
acc_overall household	1323	0.065	1.951	-10	10	acc_overall household	1814	-0.302	1.962	-9	7

Rotated factor loadings (pattern matrix)
```
-------------------------------------------------------------
Variable |  Factor1    Factor2    Factor3 |   Uniqueness
------------+--------------------------------+-------------
    acc_gen1 |  0.6243     0.0453     0.2360 |    0.5525
  acc_crops1 |  0.6565     0.0125     0.1719 |    0.5393
 acc_sellcr~1 |  0.5723     0.2869     0.0220 |    0.5897
 acc_cashcr~1 |  0.3628     0.5411     0.0493 |    0.5732
   acc_food1 |  .2187    -0.2336     0.5299 |    0.6168
 acc_sellive1 |  0.0684     0.7243     0.1437 |    0.4501
 acc_cashli~1 |  0.0185     0.7404     0.1368 |    0.4328
 acc_school~1 |  0.5406    -0.0191     0.1378 |    0.6884
 acc_buyseed1 |  0.5814     0.2720    -0.1080 |    0.5763
 acc_whoatt~1 |  0.1197     0.1834     0.7106 |    0.4470
 acc_typesi~1 |  0.0230     0.1695     0.7880 |    0.3498
 acc_overall1 |  0.3780     0.4571     0.1104 |    0.6360
-------------------------------------------------------------
-
```

Rotated factor loadings (pattern matrix
```
------------------------------------------------
Variable |  Factor1    Factor2 |   Uniqueness
------------+-------------------+-------------
    acc_gen1 |  0.7991     0.1640 |    0.3345
  acc_crops1 |  0.8559     0.1061 |    0.2563
 acc_sellcr~1 |  0.8026     0.1856 |    0.3213
 acc_cashcr~1 |  0.7740     0.2428 |    0.3420
   acc_food1 | -0.0160     0.7045 |    0.5034
 acc_sellive1 |  0.7015     0.3007 |    0.4174
 acc_cashli~1 |  0.7044     0.2829 |    0.4237
 acc_school~1 |  0.4292     0.4000 |    0.6558
 acc_buyseed1 |  0.7236     0.2659 |    0.4057
 acc_whoatt~1 |  0.3442     0.6768 |    0.4235
 acc_typesi~1 |  0.2645     0.7963 |    0.2960
 acc_overall1 |  0.3400     0.6230 |    0.4962
------------------------------------------------
```