IFPRI Discussion Paper 01656

June 2017

Understanding the Measurement of Women's Autonomy

Illustrations from Bangladesh and Ghana

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CGIAR Research Program on Policies, Institutions, and Markets

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ABSTRACT

The past decade has seen increased attention to measuring women's empowerment and autonomy, motivated by the goal of identifying promising programs and policies for reducing gender inequalities. One of the most common quantitative indicators of women's empowerment is the self-reported ability to participate in household decision making over important matters. Despite the widespread use of such indicators in the literature, uncertainty exists over how to construct valid indicators of empowerment based on questions about decision making. In particular, it is unclear how indicative joint decision making is of individual decision-making power and to what extent joint decision making reflects a consistent understanding of decision-making power within households. We utilize data from women and men in Bangladesh and Ghana to investigate whether respondents who report sole decision making in a particular domain tend to experience stronger or weaker feelings of autonomous motivation—measured using a Relative Autonomy Index—than those who report joint decision making. We find systematic differences between men and women in the association between feelings of autonomous motivation and decision-making outcomes. In addition, results vary by the domain of decision making and by whether or not there is a shared understanding of decision-making power within households. These findings suggest that in order to accurately measure empowerment, further innovation in the specificity as well as the sensitivity of indicators is needed.

Keywords: autonomy, gender, decision making, measurement

ACKNOWLEDGMENTS

This paper was undertaken as a part of the CGIAR Research Program on Policies, Institutions, and Markets, which is led by IFPRI and funded by CGIAR Fund Donors. We thank Agnes Quisumbing, Cheryl Doss, Caitlin Kieran, and participants at the 2016 Midwest International Economic Development Conference for helpful discussions and comments. We declare no conflicts of interest. This paper has not gone through IFPRI's standard peer-review procedure. The opinions expressed here belong to the authors and do not necessarily reflect those of PIM, IFPRI, or CGIAR.

1. INTRODUCTION

The past decade has seen increased attention to measuring women's empowerment and autonomy, motivated by the goal of identifying promising programs and policies for reducing gender inequalities. For the first time, the empowerment of women and girls is included in the Sustainable Development Goals as a stand-alone target. Yet a lack of high-quality sex-disaggregated data—as well as ambiguity about how best to define and measure empowerment—makes it difficult to confidently measure gender inequalities and to assess the impact of development interventions on girls and women in many settings (Peterman et al. 2015; Gammage et al. 2016; Hanmer and Klugman 2016; Klein 2016).

In the social sciences, most approaches to defining and measuring empowerment are based on the concept of agency, defined by Sen as the "ability to use those capabilities and opportunities to expand the choices they have and to control their own destiny" (1999, 10), and focus on women's ability to participate in household decision making over certain important matters (for example, major household purchases, personal healthcare, or visits with friends and relatives). Questions about decision making are routinely collected in several large-scale surveys and contribute to a large body of evidence on how socioeconomic, health, and demographic outcomes are linked with women's empowerment and agency.[1] However, despite their widespread use, uncertainty persists about how to construct indicators of women's empowerment based on these questions (Peterman et al. 2015). In particular, it is unclear how indicative joint decision making is of individual decision-making power and to what extent joint decision making reflects a consistent understanding of decision-making power within households.

This paper takes a first step toward bridging these gaps by interrogating several of the most common critiques of household decision-making indicators using comparative information on women's autonomy. Following psychologists working on a theory of motivation known as Self-Determination Theory (SDT), we depart from the standard approach of treating autonomy as interchangeable with empowerment and instead conceptualize autonomy in terms of the motivations behind a person's actions.[2] In the parlance of SDT, "motivational" autonomy is defined as behavior that is experienced as willingly enacted and fully endorsed by a person. Thus, just as with Sen's notion of agency, this definition emphasizes a person's ability to act on behalf of his or her own personal values. Given this similarity, greater understanding of the relationship between motivational autonomy and decision making may provide insights into the robustness and validity of utilizing decision-making data to measure women's empowerment.

[1] A set of decision-making questions has been included in Demographic and Health Surveys since the late 1990s, with the most recent round covering more than 40 developing countries globally.

[2] Jejeebhoy and Sathar (2001), Anderson and Eswaran (2009), and Eswaran and Malhotra (2011) all measured autonomy, at least partly, in terms of women's ability to make decisions within their households.

To this end, using data from two culturally distinct locales, Bangladesh and Ghana, we investigate whether respondents who report sole decision making in a particular domain tend to experience stronger (or weaker) feelings of autonomous motivation than those who report joint decision making. Specifically, we use multivariate regression models to estimate the association between a quantitative measure of motivational autonomy—the Relative Autonomy Index (RAI) proposed by Ryan and Deci (2000)—and, respectively, sole and joint decision-making outcomes. We find systematic differences between men and women in our sample in the association between feelings of autonomous motivation and decision-making outcomes. In addition, results vary by the domain of the decision and by whether or not there is a shared understanding of decision-making power within the household. Hence, the main lesson from our study is that the relationship between autonomous motivation and decision making largely depends on the cultural context and the decision being made.

Our findings contribute to the discourse on measuring women's empowerment and have implications for the broader use of women's empowerment and decision-making indicators as inputs, as well as outcomes, in development research. Our analysis provides evidence of significant gender- and domain-specific variation in the association of both sole and joint decision making with autonomy, which may be useful for deciphering how empowering both types of decision making are for the person(s) involved in the decisions. Note that although we frame the policy and programming relevance of our findings in terms of women's outcomes, our analysis utilizes data from both men and women. By doing so, we are able to add insight as to whether men's and women's reports agree on decision-making dynamics, as well as on how taking this heterogeneity into account affects our conclusions. Last, we expand our analysis beyond decision-making domains typically attributed to women, taking into account traditionally male-dominated productive and economic domains.

The paper proceeds as follows. Section 2 discusses measurement issues in intrahousehold decision making and further develops the concept of motivational autonomy. Section 3 describes the data and offers context for our analysis. Section 4 reviews the methodology used in the analysis. Section 5 presents our results. Section 6 concludes with a discussion of policy and research implications.

2. REVIEW OF DECISION MAKING AND AUTONOMY IN DEVELOPMENT RESEARCH

Measuring Intrahousehold Decision Making

Women's participation in intrahousehold decision making is frequently used as a metric of empowerment. The most common approach to operationalizing decision making in this manner involves condensing sole and joint decision making into a single (binary) indicator: having a "say" in a particular decision (Allendorf 2007; Anderson and Eswaran 2009; Alkire et al. 2013; Heath 2014).[3] A potential problem with this approach is that it implicitly assumes that sole and joint decision making are equally empowering for women. A lack of empirical evidence as to the conditions under which this assumption holds or does not hold has led to ambiguity about how empowering having a say in a decision actually is for women (Deere and Twyman 2012; Heckert and Fabic 2013; Peterman et al. 2015). This uncertainty stems from several limitations, which have heretofore received insufficient attention in the literature.

First and foremost, it is unclear to what extent being a joint participant in a decision reflects having a meaningful voice in the decision-making process, and how indicators might be constructed to capture any subtle differences. This concern stems, in part, from a lack of contextual details about the decision-making process itself—knowing who made a decision does not reveal everything about the mechanics of how a decision was made. For instance, joint decision making when all participants agree may reflect a different dynamic than joint decision making when there is conflict. In such cases, knowing what tends to happen when participants in a decision disagree with one another can provide valuable insight into the extent to which joint decision making reflects compromise among participants or capitulation by some participants to the wishes of another (dominant) participant. Although compromise may reflect empowerment, capitulation may or may not.

Another factor that complicates the interpretation of joint decision making concerns household composition. In households with several adult members, decisions are more likely to be made jointly due to sharing of resources and responsibilities among household members. In such households, it may be especially important to consider with whom joint decisions are made, because the implications for empowerment may be very different if a woman makes a decision jointly with her spouse or with her father, mother-in-law, or son (Doss 2013; Heckert and Fabic 2013; Peterman et al. 2015). Similarly, the interpretation of sole decision making can also vary depending on the extent to which women are constrained by the preferences of other household members or prevailing social norms (Doss 2013).

Second, if the goal is to assess women's empowerment, then we should also consider women's preferences about decision making and the extent to which their preferences align with how they actually

[3] Although not all of these studies focus on women's "empowerment" per se, the underlying concepts under scrutiny are similar (for example, agency, autonomy, bargaining power, status, and so on).

make decisions. This concern stems from the notion that the expression of agency requires that a person's actions reflect the pursuit of goals that she personally values. Unfortunately, determining how involved women wish to be in decision making on a particular matter, and relatedly, which decision-making outcomes they would consider ideal, is rarely a straightforward matter. For a particular decision, several outcomes are possible, any one of which a woman may prefer for different reasons. For example, she may prefer to (1) solely make decisions if she places high value on the freedom to make decisions without consultation, (2) jointly make decisions if she derives utility from cohesion within the household (Doss and Meinzen-Dick 2015), or (3) not be involved at all in decision making. Moreover, her preferences are likely to vary across domains depending on her available time or the level of responsibility she wishes to have. For example, decisions about children's education may be the responsibility of one spouse, decisions about children's health may be the purview of the other spouse, and decisions about when and whom children should marry may be made jointly by both spouses.

Empirical research on decision making provides evidence of significant variation across domains (Kishor and Subaiya 2008; Mabsout and van Staveren 2010; Oduro, Boakye-Yiadem, and Baah-Boateng 2012; de Brauw et al. 2014; Doss et al. 2014; Twyman, Useche, and Deere 2015). Most notably, Kishor and Subaiya (2008), using Demographic and Health Surveys data for married women ages 15–49 in 23 developing countries, found that the correlates of both sole and joint decision making varied by country and by domain in decisions over personal healthcare, large household purchases, household purchases for daily needs, and visits to family or friends.

Similarly, how women experience empowerment can vary greatly across domains (Alkire 2007; Ibrahim and Alkire 2007). A decision-making arrangement that is empowering for women in one domain may not necessarily be as empowering if experienced in another domain. For instance, a woman might be empowered inside her household (for example in household decision making or asset ownership) without experiencing improvements outside her household (such as mobility or the right to vote). Yet even within a given domain, the same set of behaviors and attributes that signify empowerment in one context may mean something entirely different in another context (Malhotra, Schuler, and Boender 2002). For example, an increase in a woman's ability to visit her parents without her husband's permission may reflect empowerment in rural Bangladesh but not in urban Ghana. Moreover, personal interpretations of what it means to be empowered can vary greatly from one woman to another even among those living in relative close proximity to each other, as Klein (2014; 2016) found to be the case among women from different neighborhoods in Bamako, Mali.

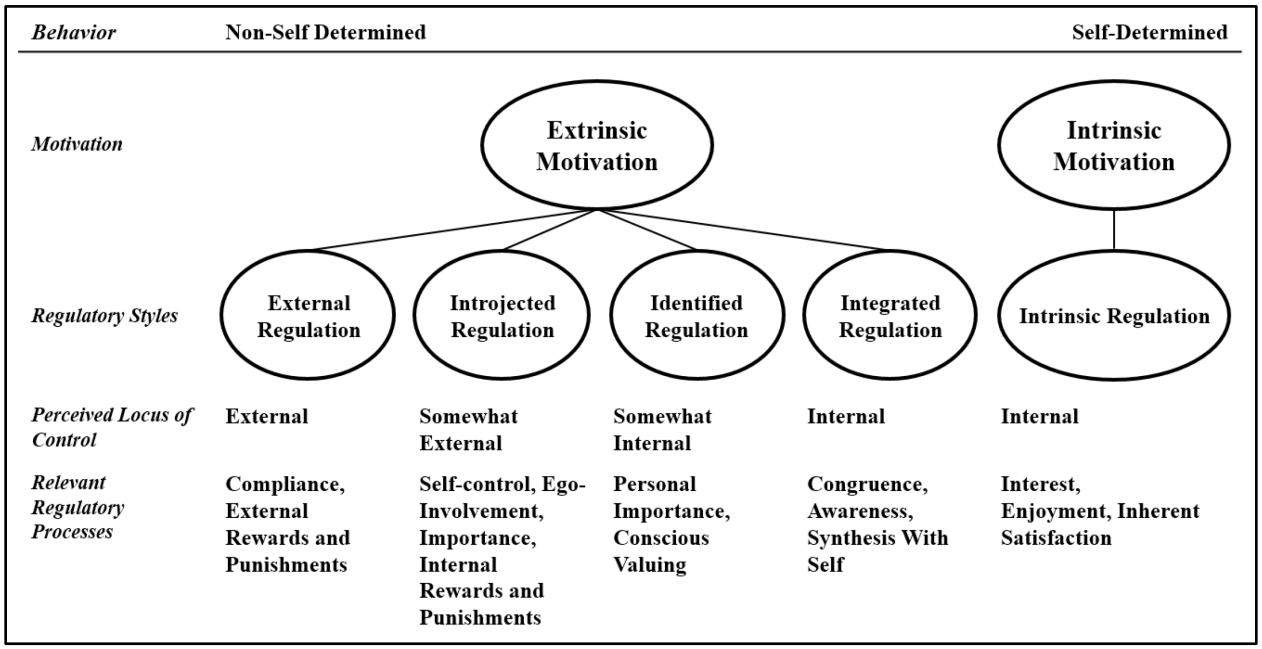
Accurately measuring empowerment requires information about the relative value a person places on participating in decision making within a domain. This paper suggests an approach to analyzing sole and joint decision making that leverages information about the motivations behind a person's actions in a way that helps us to assess how each type of decision making relates to empowerment. Details of this approach are discussed in the following section.

Measuring Autonomy[4]

According to SDT, human behavior is driven by intrinsic and extrinsic motivations (Figure 2.1). Intrinsic motivation refers to engaging in an activity for the satisfaction and fulfillment of the activity itself. It reflects the purest expression of autonomy. Extrinsic motivation refers to doing an activity to achieve some instrumental reward, separate from the experience of the activity itself, and can also reflect autonomy. SDT further categorizes extrinsic motivation into four subtypes: external regulation, introjected regulation, identified regulation, and integrated regulation. External regulation encompasses behaviors that are controlled or coerced by some external force, such as actions taken to achieve a tangible reward or to avoid a threatened punishment. Introjected regulation entails the internalization of external regulations and manifests as behaviors that are influenced by the beliefs and expectations of others, such as acting to avoid feelings of shame or anxiety or to attain ego enhancements, such as pride. Identified regulation involves conscious recognition and acceptance of the underlying value of a goal or activity as personally important, as in the decision to exercise regularly due to positive health effects. Integrated regulation occurs as identified regulations are integrated into a person's identity or self-image. External regulation and introjected regulation are the least autonomous motivations, and identified regulation and integrated regulation the most autonomous.

[4] This section draws heavily on the accounts of SDT found in Ryan and Connell (1989), Ryan and Deci (2000), and Deci and Ryan (2012).

Figure 2.1 Self-determination continuum



Source: Vaz, Pratley, and Alkire (2016), adapted from Ryan and Deci (2000).

SDT recognizes that a person's actions are often the product of several different motivations. For instance, a woman in rural Ghana may engage in all the cooking, cleaning, and childcare every day in her household because she (1) enjoys the experience of caring for her children (intrinsic), (2) appreciates the impact her care has on her children's lives (identified), (3) values her role as a mother and wife (external), and (4) fears what others would think if she quit engaging in these activities (introjected). The RAI explicitly takes these nuances into account by measuring the extent to which a person experiences each type of motivation with respect to her actions within a given domain. Specifically, we asked respondents to rate (on a Likert scale ranging from 1, "never true," to 4, "always true") how true it would be to say that their actions within a specified domain fit each of the following descriptions:

1. Motivated by a desire to avoid punishment or gain reward (external)
2. Motivated by a desire to avoid blame or so that other people speak well of you (introjected)
3. Motivated by and reflective of your own values and/or, interests (identified, integrated, and intrinsic)

Note that the last question captures all three forms of autonomous motivation (identified, integrated, and intrinsic). Each person's RAI score is calculated by summing the answers to the three questions using the following weighting scheme: -2 for external motivation (question 1), -1 for introjected motivation (question 2), and +3 for autonomous motivation (question 3), where the weights correspond to the relative positions of each motivation on the self-determination continuum (Figure 2.1). The RAI score is domain specific and ranges from -9 to 9. Positive scores are interpreted as evidence of autonomous motivation, negative scores as an indication of controlled behavior.

Relating Decision Making to Autonomy

The comparison of a person's RAI score to his or her level of participation in decision making within a given domain can be exploited to provide information about the decision-making process that avoids many of the limitations associated with measuring decision making and enhances our ability to make judgments about how empowering sole and joint decision making are to the person(s) involved. Because many of the limitations around decision-making indicators have to do with the motivations behind a person's decisions, they can be addressed by using the RAI score to tease out the level of involvement in decision making that the person might prefer, while also accounting for the impact of gender norms on the decision-making process.

The intuition behind this argument is as follows. If the actual decision-making outcome that occurs within a given domain does not align with a person's preferred outcome—say, if a woman makes decisions over her children's education alone, but ideally would prefer input from her spouse on the matter—then we expect this discrepancy to be reflected in a lower RAI score because her actions would not, in this case, reflect her own values and interests (that is, would not reflect autonomous motivation). Conversely, if the actual decision-making outcome that occurs within a given domain is a close match with a person's preferences, then we expect the RAI score to be higher because the person's actions would, in fact, reflect his or her personal values and interests. Thus, we argue that the correlation between

the RAI score and decision-making outcomes provides a de facto ranking of men's and women's decision-making preferences and insight into how empowering a person perceives each outcome to be.

Additionally, our approach is capable of handling cases in which men's and women's roles in decision making over certain matters within the household are mostly determined by gender norms. This ability stems from the fact that the internalization of gender norms reflects a form of introjected regulation. If decision-making responsibilities within a household are largely distributed among members according to gender norms (as opposed to more autonomous forms of motivation), then we expect household members' RAI scores to be low. Thus, the judgments about decision making and empowerment that emerge from our analysis should be robust to the effects of gender norms on decision-making processes.

3. DATA AND CONTEXT

Data

The data used in our analysis come from the 2011–2012 Bangladesh Integrated Household Survey (BIHS) (Ahmed 2013) and the 2012 Feed the Future Ghana Population Baseline Survey (GPBS) (USAID 2013). The BIHS is statistically representative of rural Bangladesh (as a whole); the GPBS is statistically representative of the primarily rural Feed the Future zone of influence in northern Ghana (the Upper West, Upper East, and Northern regions, and areas in Brong Ahafo Region above the eighth parallel). The total sample sizes for the BIHS and GPBS are approximately 5,500 and 4,410 households, respectively.[5] Sampling for both surveys was designed to capture female-only (defined by the absence of any male 18 years of age or older) and dual-adult (adults of both sexes present) household living arrangements. To avoid biases due to the effects of household composition on decision-making outcomes, we restrict our analysis to dual-adult households only. The resulting sample sizes for our analysis are 4,563 households in Bangladesh and 2,672 households in Ghana.

Both surveys included questions on intrahousehold decision making with respect to several different domains ("When decisions are made regarding [DOMAIN], who is it that normally takes the decision?"), as well as the three aforementioned RAI questions. Note that although in Ghana the RAI questions used a slightly different wording, both sets of questions were similarly structured and captured the same forms of motivation. The core set of domains included in both surveys captures the essential elements of life within an agricultural household (agricultural production, purchase of inputs, crop choice, marketing of crops, livestock raising, nonfarm business activity, own wage/salary employment, and minor household expenditures). In addition, the BIHS includes several nonagricultural domains (own health problems, protection from violence, expression of religion, daily tasks, and family planning), and the GBPS includes major household expenditures.

[5] See Sraboni and colleagues (2014) and Malapit and Quisumbing (2015) for details on the sampling design in the BIHS and GPBS, respectively.

Country Context

Despite recent improvements in women's access to education, labor force, and health services, considerable progress remains to be made toward achieving gender equality in both Bangladesh and Ghana (World Bank 2013, 2016a). Both countries ranked relatively poorly on the United Nations Development Programme's most recent gender inequality index: Bangladesh was 111th and Ghana was 127th out of 188 countries in total (UNDP 2015).

Women in both countries face constraints stemming from sociocultural norms around the intrahousehold division of labor. Traditionally, the roles of household head and primary income provider are assumed to be men's responsibilities, and domestic matters, such as preparing family meals and caring for children, are considered women's domain (White 1992, 22–25; Clark 1994, 285). In effect, such arrangements limit women's ability to engage in work outside the home by restricting both their mobility and their available time. Yet norms around the intrahousehold division of labor within each country are not immutable and often vary over space and time, as well as by religion, class, education, and age.

Agriculture is central to men's and women's livelihoods in both countries, but the opportunities afforded to women in agriculture in each country are very different. In Ghana, as in other parts of West Africa, men and women within the same household tend to cultivate separate plots (Doss 2002). Yet a large gender gap exists in agricultural landownership: 64 percent of plots are owned solely by men, 29 percent by women, and 3 percent jointly by men and women (Doss et al. 2011). In Bangladesh, the vast majority of agricultural plots are cultivated solely by men, with an even larger gender gap in ownership: 86 percent of plots are owned solely by men, 12 percent by women, and 2 percent jointly by men and women (Kieran et al. 2015; Seymour 2017).

Given these differences, women in the two countries might be expected to hold different preferences about agricultural decision making. Women living in Bangladesh—faced with few opportunities to exert authority over agricultural decision making—may be less inclined to differentiate

between sole and joint decision making in agriculture. For these women, having any say in decision making may be viewed as an improvement in their bargaining position within the household. In contrast, in Ghana, where it is relatively more common for women to own or operate land on their own, women's view of joint decision making may not be as favorable—some might even view joint decision making as a reduction in their bargaining position.

4. EMPIRICAL METHODOLOGY

To determine whether respondents who report sole decision making experience stronger (or weaker) feelings of autonomous motivation compared with those who report joint decision making, we investigate how autonomy correlates with participation in decision making. We begin by calculating each respondent's RAI score with respect to his or her activities in each domain and self-reports of sole or joint decision making in the domain. We then convert these variables into indexes using the first factor from factor analysis and aggregating responses across two subsets of domains, broadly corresponding to agricultural and "personal" (or noneconomic) decisions:[6]

- Agricultural decisions (Bangladesh and Ghana) include agricultural production, purchase of agricultural inputs, types of crops to grow, who takes crops to market and when, and livestock raising.
- Personal decisions (Bangladesh only) include own health problems, expression of religion, daily tasks, and family planning.

We choose an aggregate approach to minimize the risk of false positives or negatives due to multiple hypothesis testing. Nonetheless, we recognize that aggregating responses in this way potentially masks interesting and important heterogeneity across domains. Hence, as a robustness check we also conduct a domain-specific analysis of autonomy and decision making.

We estimate the following equation for each subset of domains via ordinary least squares (OLS) regression:

$$\mathrm{RAI_i} = \alpha + \mathrm{sole_i}\beta + \mathrm{joint_i}\gamma + \mathbf{X_i'}\delta + \varepsilon, \quad (1)$$

where RAI_i, $sole_i$, and $joint_i$ are aggregate indexes of autonomy, sole decision making, and joint decision making, respectively, for person i, and $\mathbf{X}$ is a vector of control variables capturing relevant individual and household characteristics that may influence decision making (Table A.1 in the appendix provides descriptive statistics). Given that we are primarily interested in whether sole and joint decision making relate to autonomy similarly or differently within each domain, our focus is on how β and γ compare with each other. To this end, we conduct a hypothesis test comparing the two coefficient estimates (H_0: $\beta = \gamma$).

[6] Relative to simply counting the incidence of sole and joint decision making across domains, this approach provides a more nuanced measure of the individual indicators by accounting for the joint distribution of responses across domains (Kline 1994).

A statistically significant difference between β and γ indicates that, on average, sole and joint decision making do not relate to autonomy in the same way. Because this relationship may vary according to gender and cultural context, we estimate equation (1) separately for men and for women within each country.

One critique of decision-making questions is that individuals within the same household may not necessarily perceive the decision-making process in the same way. Indeed, existing research suggests that couples can and do disagree when asked about decision making. For instance, based on a nationally representative survey in Ecuador, Twyman, Useche, and Deere (2015) found that men tended to report their wives as participating less in several agricultural decisions than indicated by the wives themselves. Although the decision-making questions in the BIHS and GPBS are phrased to capture how decisions about certain aspects of household life are "typically" made within the household, without reference to a particular time frame, it is possible that when formulating their answers respondents may focus on different specific instances of decision making from the past. For example, conflicting reports of decision making on crop choice from a husband and wife might arise naturally if each spouse considers a different plot—perhaps ones that he or she cultivates individually—or a different point in time as the reference point for his or her answers. Spousal conflict may also reveal something about the underlying power dynamics within the household. For example, Ambler et al. (2016), using the same data from Bangladesh used in this paper, found that agreement between couples—particularly the husband's acknowledgment of his wife's involvement in decision making—was correlated with better development outcomes for women.[7]

[7] The outcomes considered in Ambler et al. (2016) include including (1) whether the wife worked more than 10.5 hours per day, (2) the wife's body mass index, (3) whether the wife has ever used birth control, (4) the number of groups in which the wife is an active participant, and (5) whether the wife currently has a loan.

From an empirical perspective, it is unclear how to deal with this sort of inconsistency. Should spouses who give conflicting accounts be dropped from the sample? Should one partner's response be used as a proxy for the other's (as is typically done when questions are asked only of one individual within the household)?

To investigate this issue—and more specifically, whether a person's perception of autonomy depends on a consistent understanding of decision-making power within the household—we create an indicator of within-household agreement, whereby couples are judged as agreeing on decision making for a particular domain if (1) both report joint decision making or (2) one reports sole decision making and the other reports not participating in the decision. We aggregate responses across the same subsets of domains as before. However, to permit a more straightforward interpretation, we eschew a factor analytic approach in favor of simply defining a couple as being in agreement if they agree on the process used for the majority of decisions made within each subset of domains.

We estimate the following equation for each subset of domains via OLS regression:

$$\begin{aligned} \mathrm{RAI}_{ij} = {} & \alpha + \mathrm{sole}_{ij}\beta^{\mathrm{DISAGREE}} + \mathrm{joint}_{ij}\gamma^{\mathrm{DISAGREE}} + \mathrm{agreement}_{j}\theta \\ & + (\mathrm{sole}_{ij}\times\mathrm{agreement}_{j})\beta^{\mathrm{AGREE}} + (\mathrm{joint}_{ij}\times\mathrm{agreement}_{j})\gamma^{\mathrm{AGREE}} + \mathbf{X}_{i}'\delta + \varepsilon, \end{aligned} \quad (2)$$

where we add $agreement_j$, denoting couples' agreement on decision making in household *j,* and its interaction with the sole and joint decision-making indexes for person *i*. Our primary focus is on whether sole and joint decision making relate to autonomy similarly or differently when respondents agree on how decisions are made versus when they disagree. Hence, we conduct hypothesis tests comparing the coefficient estimates associated with sole and joint decision making for couples who tend to agree (H_0: $\beta^{\mathrm{AGREE}} = \gamma^{\mathrm{AGREE}}$) and those who tend to disagree (H_0: $\beta^{\mathrm{DISAGREE}} = \gamma^{\mathrm{DISAGREE}}$).

Validity of the Relative Autonomy Index

A final concern is the validity of the RAI itself. Although the RAI has been extensively tested across several different contexts (Chirkov et al. 2003; Alkire 2005; Alkire and Chirkov 2007), the majority of these exercises have been carried out among well-educated populations in more developed countries. Two exceptions, however—Vaz and others (2013) and Vaz, Pratley, and Alkire (2016)—found support for the

overall reliability and validity of the RAI (albeit with mixed results) using data from Bangladesh and Chad, respectively.[8]

Bearing in mind concerns about the performance of the RAI among less educated populations, we conduct an analysis of the validity of the RAI following the same general procedures laid out by Vaz, Pratley, and Alkire (2016). The results of this analysis are presented in Tables A.2–A.8 in the appendix.

First, we conduct an exploratory factor analysis (EFA) to test whether the dimensional structure of the data reflects the latent characteristics that the questions aim to measure, that is, external, introjected, and autonomous motivations. We generally find support for this hypothesis. The EFA results indicate that given reasonably sized samples—which we obtain by restricting our analysis to subsets of the domains available in the data—three dimensions emerge from the data, each one corresponding to one of the motivation subscales. The lone exception occurs among men in the Bangladesh sample, for whom only two factors emerge when we consider the subset of domains pertaining to personal decisions.

Next, we calculate Spearman correlation matrixes to test whether there is ordered correlation among the motivation subscales that conforms to the self-determination continuum—that is, whether adjacent subscales (for example, external and introjected motivation) are more correlated than nonadjacent subscales (for example, external and autonomous motivation). We find mixed results for this hypothesis. Although the patterns of correlation observed in the data for men and women in Ghana and men in Bangladesh are generally a good fit for the self-determination continuum, we find evidence of positive correlation between nonadjacent subscales (external and autonomous motivation) among Bangladeshi women in the sample. One potential explanation for this pattern, offered by Vaz and others (2013), is that it may reflect an internalization of social norms that makes it hard for women in Bangladesh to discern between doing something because it aligns with their own values and interests and doing something to avoid punishment or gain reward. Another possible explanation is measurement error, perhaps stemming from respondents' confusion over the differences among the three motivations asked

[8] In fact, Vaz and others (2013) analyzed the same data for Bangladesh that we use in this paper, though with slight differences in specification.

about in the questions. Indeed, evidence from two studies assessing the cognitive validity of the Women's Empowerment in Agriculture Index in Bangladesh, Uganda, and Haiti suggests that the RAI questions can be particularly difficult for some respondents to comprehend (Johnson and Rosell 2015; Malapit, Sproule, and Kovarik 2016).

Concerns about its validity notwithstanding, we believe that analysis of the RAI can offer valuable insights into men's and women's behaviors. Vaz and others (2013) reached a similar conclusion, contending that the RAI provides new information about individual behavior that is not captured by other indicators. Nevertheless, we exercise caution in the interpretation of our results and revisit in later discussion many of the concerns raised in this section.

5. RESULTS

Decision-Making Outcomes

Tables 5.1 and 5.2 provide a breakdown of men's and women's decision making in Bangladesh and Ghana, respectively. Several trends are evident. Overall, men in both countries are more likely than women to report sole decision making and less likely to report having no input into decision making. Nevertheless, there are a few domains in which the gender gap in sole decision making is comparatively narrower, such as decisions about the expression of one's religious faith or daily tasks (in Bangladesh) and nonfarm business activity (in Ghana). Although this narrowing may reflect actual outcomes, it is also possible that questions about decision making in these domains were interpreted as applying specifically to the respondent's own activities, as opposed to household activities in general. A different pattern is apparent in the rates of joint decision making reported by men and women in Bangladesh. Women reported joint decision making at more than twice the frequency of men for several domains (agricultural production, purchase of agricultural inputs, crop choice, marketing of crops, and nonfarm business activity). In comparison, men and women in Ghana reported joint decision making at roughly the same frequency across domains.

Tables 5.1 and 5.2 also show the mean RAI scores of men and women in Bangladesh and Ghana, respectively. RAI scores are positive, ranging from approximately 3.4 to 5.2, with slightly lower mean values for Bangladesh than for Ghana. Positive mean values signify that, on average, respondents' behaviors are primarily motivated by personal values and interests rather than controlled by external factors. In Ghana, women reported significantly lower levels of autonomy than men across all domains. In Bangladesh, however, a more complicated pattern arises. Although women reported less autonomy than men for 7 out of 13 domains (agricultural production, purchase of inputs, crop choice, marketing of crops, nonfarm business activity, own wage or salaried employment, and minor household expenditures), they reported similar or higher levels of autonomy for the remaining 6 domains (livestock raising, own health problems, protection from violence, expression of religion, daily tasks, and family planning).

Table 5.1 Decision-making outcomes and Relative Autonomy Index scores by gender, Bangladesh

	Percentage of respondents reporting …									
	Sole decision making		Joint decision making		No input in decision making		Mean RAI score (range -9 to 9)		Number of respondents	
Domain	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Agricultural production	77.69	1.82	19.92	47.89	2.39	50.30	4.34	4.14	2,846	2,863
Purchase of inputs	77.51	1.69	19.96	49.05	2.52	49.26	4.35	4.06	2,815	2,848
Crop choice	77.32	1.58	20.19	51.35	2.49	47.06	4.42	4.05	2,813	2,843
Marketing of crops	77.25	2.16	20.25	51.21	2.50	46.63	4.42	4.03	2,642	2,685
Livestock raising	44.83	20.68	44.30	67.05	10.87	12.28	4.31	4.16†	2,815	2,892
Nonfarm business activity	76.26	6.50	17.81	49.22	5.92	44.28	4.33	3.44	2,195	1,599
Own wage/salaried employment	87.16	20.07	10.67	43.56	2.17	36.38	4.35	3.81	2,625	1,839
Minor household expenditures	55.73	11.90	41.21	62.48	3.06	25.62	4.44	4.28	4,513	4,470
Own health problems	44.14	3.60	52.42	71.14	3.44	25.25	4.03	4.13†	4,035	4,245
Protection from violence	58.78	11.21	31.39	49.69	9.83	39.10	3.41	4.21	1,628	1,284
Expression of religion	89.74	69.07	9.61	23.15	0.65	7.78	3.71	4.35	3,819	3,227
Daily tasks	84.18	73.95	14.14	23.44	1.69	2.61	4.46	4.61	4,266	4,250
Family planning	15.44	23.49	78.40	74.67	6.15	1.84	3.84	4.25	3,445	3,534

Source: Authors' calculations based on Ahmed (2013).
Note: Total number of households in sample: 4,563. The percentages shown in columns 2–7 and totals shown in columns 10 and 11 exclude respondents who reported that decisions about a given domain were not made in their households. Gender differences are statistically significant at a 90 percent or greater confidence level unless indicated (†).
RAI = Relative Autonomy Index.

Table 5.2 Decision-making outcomes and Relative Autonomy Index scores by gender, Ghana

	Percentage of respondents reporting …									
	Sole decision making		Joint decision making		No input in decision making		Mean RAI score (range -9 to 9)		Number of respondents	
Domain	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Agricultural production	70.33	2.71	26.69	28.04†	2.97	69.25	4.78	3.86	2,454	2,436
Purchase of inputs	70.45	2.82	26.63	27.75†	2.92	69.43	4.95	4.03	2,430	2,411
Crop choice	67.69	2.93	29.16	30.31†	3.15	66.76	5.05	4.16	2,442	2,422
Marketing of crops	58.02	11.09	30.50	30.97†	11.48	57.94	4.88	4.19	2,177	2,147
Livestock raising	71.22	2.85	24.63	24.95†	4.16	72.20	5.07	4.15	1,949	1,896
Nonfarm business activity	43.91	42.63	27.40	30.80	28.68	26.57	4.96	4.21	1,175	1,302
Own wage/salaried employment	63.12	14.58	26.92	32.48	9.95	52.94	4.99	4.28	442	391
Major household expenditures	50.86	3.41	43.51	42.45†	5.63	54.14	5.23	4.46	1,048	1,027
Minor household expenditures	32.48	21.55	46.53	49.05	20.99	29.39	4.92	4.20	2,620	2,589

Source: Authors' calculations based on USAID (2013).
Note: Total number of households in sample: 2,672. The percentages shown in columns 2–7 and totals shown in columns 10 and 11 exclude respondents who reported that decisions about a given domain were not made in their households. Gender differences are statistically significant at a 90 percent or greater confidence level unless indicated (†).
RAI = relative autonomy index.

Regression Analysis

Table 5.3 presents the regression results of our aggregate analysis. Note that when comparing coefficient estimates, it is advisable to focus on the statistical significance of the difference between estimates, rather than the statistical significance of each estimate itself (Gelman and Stern 2006). Hence, our discussion prioritizes the results of the hypothesis test of whether the coefficients associated with sole and joint decision making are equal over the size and significance of the coefficient estimates themselves.

Table 5.3 Ordinary least squares regression results predicting Relative Autonomy Index scores, by gender and country

	Bangladesh				Ghana	
	Agricultural decisions		Personal decisions		Agricultural decisions	
Variable	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**
Sole decision making (β)	0.019	0.158*	-0.063	0.344***	0.025	0.102
	(0.029)	(0.076)	(0.066)	(0.090)	(0.023)	(0.070)
Joint decision making (γ)	0.154***	0.141†	-0.186**	0.106	0.019	0.047
	(0.041)	(0.084)	(0.059)	(0.084)	(0.031)	(0.068)
Age	-0.027†	0.004	0.001	-0.011	-0.011	-0.006
	(0.015)	(0.012)	(0.012)	(0.010)	(0.010)	(0.008)
Age squared/1,000	0.390*	0.038	0.020	0.160	0.143	0.068
	(0.175)	(0.125)	(0.154)	(0.105)	(0.117)	(0.080)
Completed primary education	0.025	0.106	0.014	0.026	0.261†	0.126
	(0.069)	(0.067)	(0.057)	(0.056)	(0.147)	(0.173)
Higher than primary education	-0.011	-0.053	0.118	-0.158	0.097	0.315†
	(0.175)	(0.109)	(0.159)	(0.100)	(0.192)	(0.189)
Married	0.049	-0.009	-0.055	-0.279	-0.226	-0.262†
	(0.189)	(0.144)	(0.348)	(0.247)	(0.208)	(0.137)
Age gap: Husband - wife	0.004	-0.004	0.002	-0.005	0.003	0.001
	(0.004)	(0.004)	(0.003)	(0.004)	(0.002)	(0.003)
Husband more educated than wife	-0.028	-0.109†	-0.034	-0.049	0.116	-0.170
	(0.058)	(0.063)	(0.048)	(0.052)	(0.077)	(0.170)
Christian	—	—	—	—	0.145*	0.092
					(0.067)	(0.069)
Muslim	0.084	-0.233*	-0.200	-0.225*	-0.061	-0.057
	(0.191)	(0.116)	(0.138)	(0.108)	(0.079)	(0.081)
(log) Area of cultivated land	0.027	0.214*	0.001	0.129	0.081	0.134**
	(0.132)	(0.096)	(0.116)	(0.097)	(0.052)	(0.051)
(log) Per capita consumption	0.058	0.217***	0.081	0.209**	-0.126**	-0.112**
	(0.066)	(0.058)	(0.066)	(0.066)	(0.039)	(0.039)
Ethnicity dummies	No	No	No	No	Yes	Yes
Adjusted R-squared	0.021	0.032	0.021	0.071	0.029	0.030
H_0: β = γ (F-statistic)	9.120**	0.217	12.929***	58.863***	0.031	3.131†
Observations	1,525	1,949	2,246	2,453	1,634	1,671

Source: Authors' calculations based on Ahmed (2013) and USAID (2013).
Note: Robust standard errors clustered at the primary sampling unit level in parentheses. †, *, **, and *** indicate statistical significance at the 90 percent, 95 percent, 99 percent, and 99.9 percent confidence levels, respectively. Em dash (—) = data not available.

Although sole and joint decision making are both positively correlated with autonomy for women in both countries for agricultural decisions (though not always statistically significantly so), our results point to a clear distinction in the way in which women in each country experience sole and joint decision making. Notably, the difference in the coefficients associated with sole and joint decision making is statistically significant in Bangladesh, but not in Ghana. In fact, among women in Bangladesh, joint decision making is much more strongly associated with autonomy than sole decision making. In Ghana, however, neither coefficient is statistically significant. Hence, at least in terms of agricultural decisions, joint decision making may be a stronger predictor of autonomy than sole decision making for women in Bangladesh, but not for women in Ghana, where neither mode of decision making seems to predict autonomy.

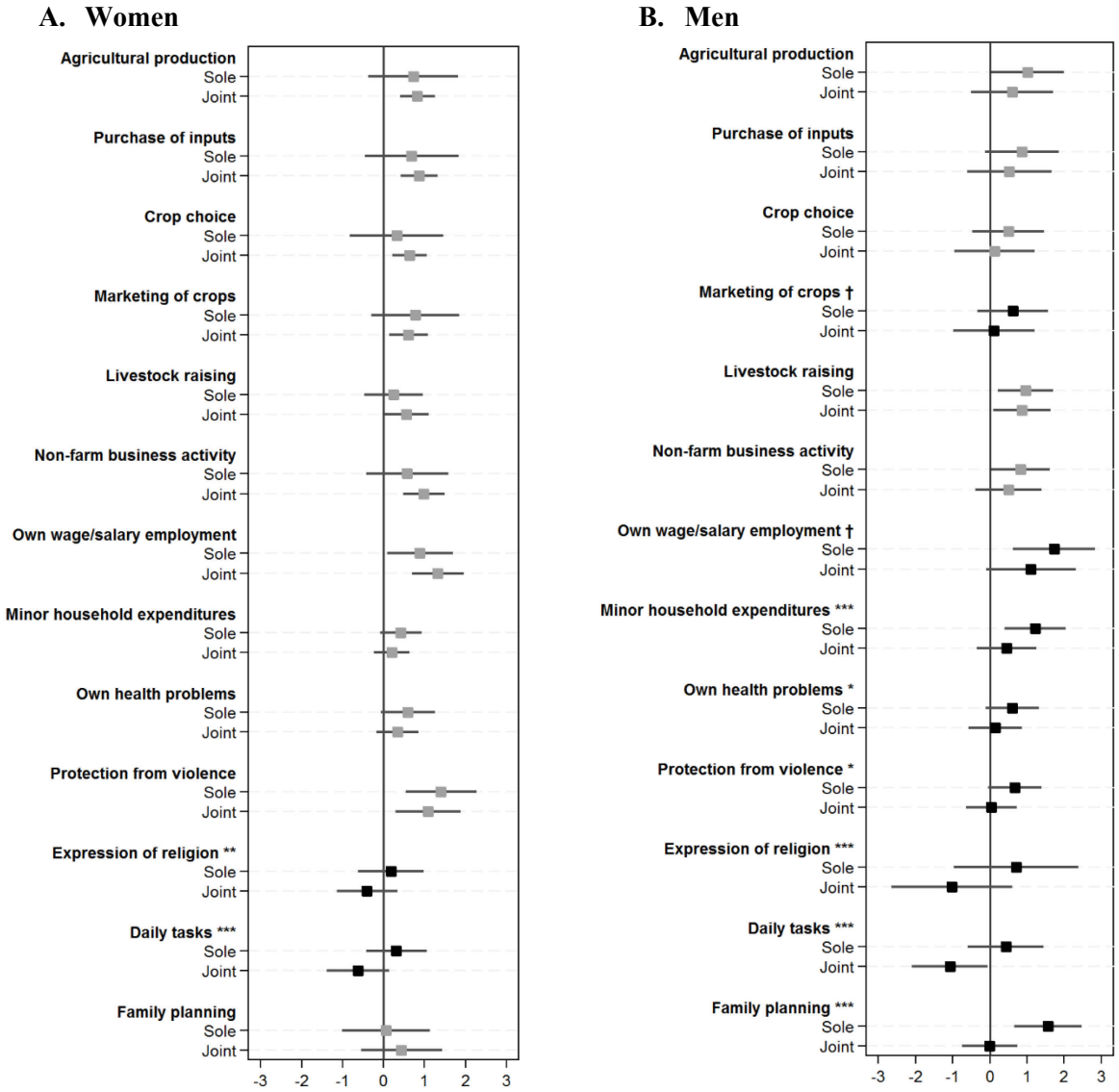
Interestingly, we see something different for women in Bangladesh for personal decisions. Although the difference in the coefficients associated with sole and joint decision making is still statistically significant, both modes of decision making (and especially joint decision making) are negatively correlated with autonomy. Thus, in contrast to agricultural decisions—where joint decision making is associated with greater autonomy—joint decision making on personal matters is associated with a reduction in women's autonomy.

Among men, yet another pattern emerges. In Bangladesh, the difference in the coefficients associated with sole and joint decision making is not statistically significant for agricultural decisions, though both types of decision making are positively (and statistically significantly) correlated with autonomy. In Ghana, the difference in the coefficients is statistically significant, yet just as with women in Ghana, neither mode of decision making is significantly associated with autonomy. For personal decisions among men in Bangladesh, the difference between the coefficients is statistically significant, yet among the coefficients, only the one associated with sole decision making is statistically significant.

Sensitivity Analysis to Domain-Specific Heterogeneity

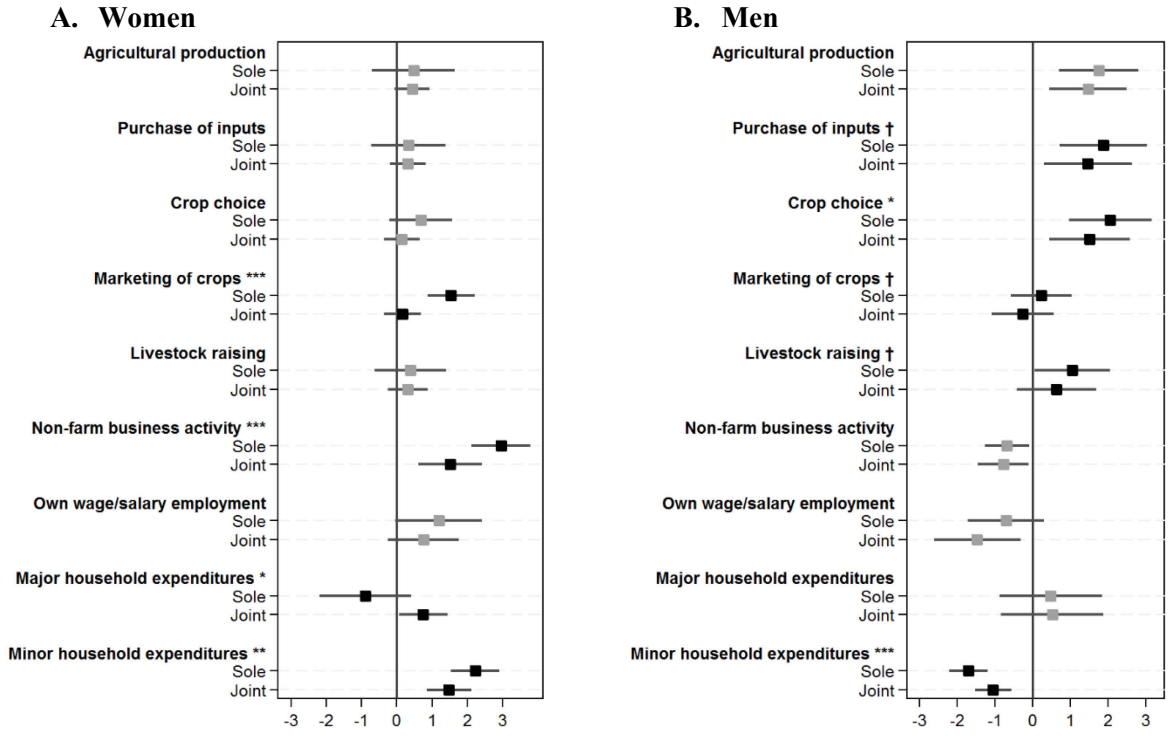
Figures 5.1 and 5.2 show the coefficient estimates associated with sole and joint decision making obtained when we repeat the above analysis separately for each domain of decision making (significance at or above $p < 0.10$ denoted by a black point estimate marker, with the significance level reported alongside the domain labels). Full regression results are presented in Tables A.9–A.12 in the appendix.

Figure 5.1 Sole and joint decision-making coefficient estimates predicting Relative Autonomy Index scores, with 95 percent confidence intervals, by gender, Bangladesh



Source: Authors' calculations based on Ahmed (2013).
Note: Coefficients from ordinary least squares models with robust standard errors clustered at the primary sampling unit level and 95 percent confidence intervals indicated by error bars. Statistically significant differences between the coefficients associated with sole and joint decision making indicated by black markers. †, *, **, and *** at the 90 percent, 95 percent, 99 percent, and 99.9 percent confidence levels, respectively. Full regression results are provided in Tables A.9 and A.10 in the appendix.

Figure 5.2 Sole and joint decision-making coefficient estimates predicting Relative Autonomy Index scores with 95 percent confidence intervals, by gender, Ghana



Source: Authors' calculations based on USAID (2013).
Note: Coefficients from ordinary least squares models with robust standard errors clustered at the primary sampling unit level and 95 percent confidence intervals indicated by error bars. Statistically significant differences between the coefficients associated with sole and joint decision making indicated by black markers and †, *, **, and *** at the 90 percent, 95 percent, 99 percent, and 99.9 percent confidence levels, respectively. Full regression results are provided in Tables A.11 and A.12 in the appendix.

Domain-specific analysis allows us to perceive several nuances that are masked in the aggregate analysis. Most notably, among women in Bangladesh, the stark contrast observed in how sole and joint decision making relate to autonomy for agricultural decisions in aggregate is less evident at the domain level. Although joint decision making still appears nominally more correlated with autonomy than sole decision making in all agricultural decisions except the marketing of crops, differences between the coefficients are not statistically significant. For personal decisions, the domain-specific results reveal that the negative correlation initially observed between joint decision making and autonomy is largely driven by statistically significant differences in just two domains: expression of religion and daily tasks.

Among women in Ghana, however, the domain-specific results largely echo the aggregate results. Differences between sole and joint decision making are statistically significant in only one agricultural

domain: marketing of crops. We do, however, observe significant differences in three out of four nonagricultural domains: nonfarm business activity, major household expenditures, and minor household expenditures.

For men in Bangladesh, the aggregate and domain-specific results are, again, quite similar. Differences in the coefficients associated with sole and joint decision making tend to be statistically insignificant for agricultural decisions (marketing of crops is the exception) but statistically significant for personal decisions (nonfarm business activity is the exception). The domains where we observe the largest differences—all in favor of sole decision making—are expression of religion, daily tasks, and family planning. Interestingly, women in Bangladesh also exhibit large significant differences—again, in favor of sole decision making—in two of these domains: expression of religion and daily tasks.

For men in Ghana, domain-specific analysis reveals small but statistically significant differences in the coefficients associated with sole and joint decision making in every agricultural domain except one (agricultural production), which in all cases favor sole decision making. Unlike those for women, differences in the nonagricultural domains are statistically significant in only one of the four domains, minor household expenditures, where, surprisingly, joint decision making is viewed as more autonomous than sole decision making.

Sensitivity Analysis to Couples' Agreement on Decision Making

Table 5.4 shows the percentage of sampled households in which the primary couple give the same accounts of decision making for each domain. Overall, we see that couples are much more likely to agree on whether decisions were made in their households about a particular topic (ranging from 57 to 97 percent in Bangladesh and from 87 to 99 percent in Ghana) than on how decisions were made (ranging from 5 to 42 percent in Bangladesh and from 9 to 75 percent in Ghana). Particularly striking are several domains in which nearly all couples give conflicting reports of decision making (protection from violence, expression of religion, and daily tasks in Bangladesh; own wage or salaried employment in Ghana).

Table 5.4 Couples' agreement on decision-making outcomes, by domain and country

	Bangladesh		Ghana	
	Percent of HHs in which couples agree on …		Percent of HHs in which couples agree on …	
Domain	Whether decisions are made	How decisions are made	Whether decisions are made	How decisions are made
Agricultural production	90.29	29.98	99.17	75.17
Purchase of inputs	89.72	29.39	98.87	74.27
Crop choice	89.70	28.18	98.95	73.52
Marketing of crops	84.02	24.92	95.86	62.97
Livestock raising	85.29	23.12	93.07	55.40
Nonfarm business activity	69.49	12.65	87.00	27.56
Own wage/salaried employment	59.06	11.11	92.80	8.80
Major household expenditures	—	—	93.29	27.33
Minor household expenditures	96.91	41.66	97.02	74.19
Own health problems	84.09	39.23	—	—
Protection from violence	57.18	5.52	—	—
Expression of religion	68.57	4.73	—	—
Daily tasks	89.44	5.26	—	—
Family planning	76.75	41.42	—	—

Source: Authors' calculations based on Ahmed (2013) and USAID (2013).
Note: — = data not available; HH = household.

Given the high frequency of conflicting reports, the lack of significant differences observed between the coefficients associated with sole and joint decision making could be due to converging ambiguities in how decisions are made vis-à-vis the decision-making preferences of each individual. We therefore attempt to rule out the possibility that including conflicting responses in our sample biases the results, by re-estimating our model to include interaction effects between sole or joint decision making and agreement between spouses (see equation [2]). Table 5.5 shows the results.

Table 5.5 Ordinary least squares regression results predicting Relative Autonomy Index scores with agreement interaction terms, by gender and country

	Bangladesh				Ghana	
	Agricultural domains		Noneconomic domains		Agricultural domains	
Variable	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**
Sole decision making ($\beta^{DISAGREE}$)	0.031	0.183*	0.003	0.336***	0.005	0.077
	(0.033)	(0.079)	(0.091)	(0.089)	(0.030)	(0.132)
Joint decision making ($\beta^{DISAGREE}$)	0.184**	0.209*	-0.137	0.110	-0.056	0.117
	(0.059)	(0.088)	(0.083)	(0.084)	(0.054)	(0.133)
Agreement on decision making	-0.050	0.004	0.381	0.535***	-0.006	0.267***
	(0.072)	(0.052)	(0.276)	(0.120)	(0.086)	(0.075)
Sole decision-making × agreement on decision making (β^{AGREE})	-0.055	-0.224	-0.001	-0.038	0.038	0.002
	(0.063)	(0.222)	(0.195)	(1.031)	(0.051)	(0.153)
Joint decision-making × agreement on decision making (γ^{AGREE})	-0.086	-0.298	-0.018	-0.283	0.097	-0.097
	(0.078)	(0.220)	(0.110)	(1.003)	(0.060)	(0.154)
Age	-0.028†	0.005	0.000	-0.011	-0.011	-0.005
	(0.015)	(0.012)	(0.013)	(0.011)	(0.010)	(0.008)
Age squared/1,000	0.399*	0.021	0.030	0.157	0.137	0.061
	(0.176)	(0.124)	(0.157)	(0.110)	(0.117)	(0.081)
Completed primary education	0.023	0.101	0.010	0.015	0.257†	0.119
	(0.070)	(0.067)	(0.057)	(0.056)	(0.148)	(0.172)
Higher than primary education	-0.002	-0.045	0.101	-0.159	0.090	0.305
	(0.173)	(0.109)	(0.159)	(0.101)	(0.192)	(0.189)
Married	0.025	0.000	-0.063	-0.287	-0.203	-0.269*
	(0.195)	(0.145)	(0.349)	(0.248)	(0.220)	(0.134)
Age gap: Husband - wife	0.004	-0.004	0.002	-0.005	0.003	0.000
	(0.004)	(0.004)	(0.003)	(0.004)	(0.002)	(0.003)
Husband more educated than wife	-0.022	-0.105†	-0.035	-0.039	0.111	-0.163
	(0.058)	(0.063)	(0.048)	(0.052)	(0.077)	(0.170)
Christian	—	—	—	—	0.141*	0.098
					(0.067)	(0.070)
Muslim	0.083	-0.231*	-0.201	-0.220*	-0.057	-0.062
	(0.192)	(0.116)	(0.138)	(0.107)	(0.079)	(0.081)
(log) Area of cultivated land	0.023	0.207*	0.005	0.136	0.082	0.131*
	(0.131)	(0.097)	(0.116)	(0.096)	(0.052)	(0.051)
(log) Per capita consumption	0.059	0.217***	0.084	0.208**	-0.124**	-0.111**
	(0.066)	(0.058)	(0.066)	(0.065)	(0.040)	(0.040)
Ethnicity dummies	No	No	No	No	Yes	Yes
Adjusted R-squared	0.022	0.033	0.023	0.078	0.029	0.036
H_0: $\beta^{AGREE} = \gamma^{AGREE}$ (F-statistic)	0.108	2.196	0.008	10.875***	0.752	1.629
H_0: $\beta^{DISAGREE} = \gamma^{DISAGREE}$ (F-statistic)	6.647*	0.379	16.353***	49.287***	1.401	0.393
Observations	1,525	1,949	2,246	2,453	1,634	1,671

Source: Authors' calculations based on Ahmed (2013) and USAID (2013).

Note: Robust standard errors clustered at the primary sampling unit level in parentheses. †, *, **, and *** indicate statistical significance at the 90 percent, 95 percent, 99 percent, and 99.9 percent confidence levels, respectively. — = data not available.

We find that a common understanding of decision-making power between spouses does have a bearing on how each spouse associates sole and joint decision making with autonomy. Indeed, if couples agree on decision making, the difference in the coefficients associated with sole and joint decision making tends not to be statistically significant. This finding is true for nearly all of our subsamples, regardless of

gender, country, or domain. The only exception is noneconomic decisions among men in Bangladesh, where the difference in the coefficients is statistically significant regardless of whether couples agree or disagree.

Disagreement between spouses also appears to affect the association between sole or joint decision making and autonomy, but in the opposite way as agreement and only under certain circumstances. Among couples in Bangladesh who disagree on decision making, the difference in the coefficients associated with sole and joint decision making statistically significant for women, regardless of domain; for men, the difference is statistically significant for noneconomic decisions but not for agricultural decisions. In Ghana, differences are not statistically significant among people who disagree with their spouse, regardless of gender.

In light of these results, our earlier findings may, in fact, be explained by relative differences in the frequency of agreement observed in each country, with higher rates of agreement among couples in Ghana translating to fewer significant differences between the coefficients associated with sole and joint decision making, and vice versa in Bangladesh.

6. DISCUSSION AND CONCLUSION

Despite widespread agreement on the importance of women's empowerment, ambiguity exists about how best to define and measure it (Peterman et al. 2015). Using data on men and women from Bangladesh and Ghana, we analyze whether respondents who report sole decision making in a particular domain tend to experience stronger (or weaker) feelings of autonomous motivation than those who report joint decision making. We find evidence of systematic differences between men and women in the way that sole and joint decision making predict autonomy. Whereas men and women in Bangladesh tend to clearly distinguish between sole and joint decision making, this is less the case for those in Ghana. In particular, we find that joint decision making on agricultural matters is a stronger predictor of autonomy than sole decision making for women in Bangladesh, whereas in Ghana, neither mode of decision making seems to predict autonomy—a pattern that may be attributable to differences in norms governing the organization of agricultural production in each country.

Our analysis also reveals variation in the relationship between sole or joint decision making and autonomy that depends on the specific domain of decision making under scrutiny. Most notably, we find that sole and joint decision making predict autonomy differently depending on the type of decision being made (that is, whether it is agricultural or personal in nature). Results suggest that two things happen as decisions become more personal in nature: (1) the line between sole and joint decision making grows more distinct and (2) autonomy begins to be more strongly associated with making decisions by oneself than with someone else. Conducting the analysis at both an aggregate and a domain-specific level adds significant value and provides unique insights that would have been missed had we followed only a single approach. Thus, our results suggest that the best course of action when analyzing multidomain decision-making data may be to analyze along both aggregate and domain-specific lines.

We also find that agreement on decision making among couples—evidence of a consistent understanding of decision-making power within the household—does, in certain instances, affect the way in which individuals associate sole or joint decision making with autonomy. How decisions are made—

whether solely or jointly—appears to matter much more for the prediction of autonomy when couples disagree on decision making than when they agree. Thus, agreement on decision making may, in fact, reveal something important about the underlying power dynamics within the household, and as such, is a subject worthy of future attention among researchers trying to measure the empowerment or agency of individuals within the household.

Considered together, our results suggest that the degree to which men and women associate different decision-making outcomes with autonomous behavior is idiosyncratic and likely to vary from one context to another, depending on the particular decision being made as well as sociocultural norms and other local features. Including autonomy in analyses and utilizing multiple decision-making indicators that account for agreement between spouses may be an effective means of calibrating indicators of empowerment to better suit different contexts. For example, given that we find that women in Bangladesh tend to associate joint decision making on agricultural matters with autonomy more strongly than they do sole decision making in the presence of spousal disagreement, indicators constructed to prioritize joint decision making in these situations may provide a more accurate picture of women's empowerment. Our findings also underscore the importance of considering an expanded set of decision-making domains, which crosscut personal and economic decisions and fall into both traditionally male and female domains within any given cultural setting, to more holistically capture empowerment.

There are several limitations to this analysis. One is the interpretation and validation of the RAI in development settings—which has been questioned in the literature and also shows some weaknesses according to our own tests of validity (see appendix). In addition, the RAI deeply relies on each person's self-perception of autonomy. Thus, a person may feel him- or herself to be autonomous—and thus register a high RAI score—yet outside observers may have reason to question the accuracy of the self-assessment. That is, people's values may be shaped so deeply by the circumstances of their everyday lives that they cannot conceive of what it would mean to live a truly autonomous life. In other words, they may exhibit adaptive preferences (Sen 1985, 1990; Nussbaum 2000). Indeed, Alkire and Chirkov (2007) found that among women living in Kerala, India, adaptive preferences often arose with respect to their

household responsibilities, which many felt to be an integral part of their identity as good and dutiful wives and mothers. This possibility should be borne in mind when considering our results, inasmuch as the RAI scores we observe may overestimate men's and women's actual levels of autonomy. Unpacking the concepts of motivation behind autonomy and the meaning attached to empowerment to determine the extent to which this is true in our data would require additional qualitative work, which arguably should be part of any evaluation seeking to determine program or policy impacts on women's empowerment. Finally, our sample in Ghana is a select group of dual-adult households sampled for the purpose of Feed the Future monitoring and evaluation, and thus our ability to extend results to other household demographic arrangements or make population-level generalizations is limited.

Nonetheless, our results have implications not only for measuring women's empowerment in Bangladesh and Ghana, as noted above, but also for the development research community as a whole. Namely, our study cautions researchers interested in measuring women's empowerment against combining sole and joint decision making into a single indicator without prior analysis of the conditions in which this methodology might be appropriate, in particular whether spouses share a common understanding of decision making. Relatedly, although we do not fully interrogate the types of women and men who tend to agree or disagree on decisions, nor the sources of disagreement, a clear implication is the importance of considering who in the household is being asked questions and how the choice of respondent might change the outcomes or conclusions of a given research investigation.

Despite the limitations of current constructions and analysis of decision-making indicators, we document large gender disparities in average reporting on decision making and autonomy—whereby men consistently report higher sole decision making and autonomy than women. These disparities underscore the need for continued investigation into both programmatic and policy actions to reduce gender gaps, accompanied by rigorous analysis and innovation in measurement. Based on the still unresolved sources of measurement and other biases in traditional decision-making indicators, it is unlikely that such measures alone will be able to accurately capture culturally specific gender barriers in the way necessary to advance the field. Although promising research is exploring subjective measures of empowerment,

often utilizing vignettes or field experiments (Almås et al. 2015; Malapit, Sproule, and Kovarik 2016), accurately measuring women's empowerment may necessitate the construction of distinct indicators to fit different cultural, economic, and political contexts. Furthermore, simply utilizing women's (or men's) reports of decision making alone may mask large variations in autonomy and, perhaps, in the underlying concept of empowerment. Researchers should invest in unpacking, interrogating, and innovating around measurement of autonomy in different contexts to better contribute to measuring and reducing gender inequalities, and enhancing the empowerment and agency of all individuals.

APPENDIX: SUPPLEMENTARY TABLES

Table A.1 Descriptive statistics by gender, Bangladesh and Ghana

	Bangladesh		Ghana	
Variable	**Women**	**Men**	**Women**	**Men**
Age (years)	36.8	44.1	37.3	45.4
Less than primary education†	0.60	0.61	0.93	0.83
Completed primary education†	0.36	0.30	0.03	0.08
Higher than primary education†	0.03	0.05	0.03	0.09
Married†	0.97	0.94	0.98	0.95
Age gap: Primary male – female (years)	7.36	7.36	8.09	8.08
Primary male more educated than female†	0.30	0.30	0.13	0.13
Religion of HH Head: Muslim†	0.88	0.88	0.45	0.45
Religion of HH Head: Christian†	—	—	0.31	0.31
Religion of HH Head: Other†	0.12	0.12	0.23	0.23
Area of cultivated land (ha)	0.32	0.32	1.71	1.71
Annual per capita consumption (US dollars)	234	234	588	588
Observations	4,563	4,563	2,672	2,672

Source: Authors' calculations based on Ahmed (2013) and USAID (2013).

Note: † dummy variable. The average exchange rates of taka (Bangladesh) and cedis (Ghana) per US dollar in 2012 were 81.9 and 1.8, respectively (World Bank 2016b). — = data not available; HH = household.

Table A.2 Results of exploratory factor analysis considering all domains of decision making, by gender, Bangladesh

		Women				Men			
Domain	Subscale	Factor 1	Factor 2	Factor 3	Factor 4	Factor 1	Factor 2	Factor 3	Factor 4
Agricultural production	External	0.929					0.713		0.365
Purchase of agricultural inputs	External	0.947							0.735
Types of crops to grow	External	0.943					0.734		0.363
Who takes crops to market or when	External	0.954							0.760
Livestock raising	External	0.900					0.727		0.342
Nonfarm business activity	External	0.940							0.717
Own wage or salaried employment	External	0.938					0.784		
Minor household expenditures	External	0.934							0.661
Own health problems	External	0.916					0.775		
Protection from violence	External	0.923							0.670
Expression of religion	External	0.949					0.687		
Daily tasks	External	0.922							0.713
Family planning	External	0.928					0.705		
Agricultural production	Introjected			0.934				0.730	
Purchase of agricultural inputs	Introjected			0.897			0.729	0.310	
Types of crops to grow	Introjected			0.851				0.748	
Who takes crops to market or when	Introjected			0.662			0.779		
Livestock raising	Introjected			0.311	0.322			0.758	
Nonfarm business activity	Introjected			0.437			0.790		
Own wage or salaried employment	Introjected			0.315	0.391			0.666	
Minor household expenditures	Introjected				0.409		0.721	0.301	
Own health problems	Introjected			0.484				0.760	
Protection from violence	Introjected			0.400			0.761	0.323	
Expression of religion	Introjected				0.775			0.748	
Daily tasks	Introjected				0.930		0.715	0.326	
Family planning	Introjected				0.860			0.682	
Agricultural production	Autonomous		0.800			0.921			
Purchase of agricultural inputs	Autonomous		0.845			0.946			
Types of crops to grow	Autonomous		0.827			0.926			
Who takes crops to market or when	Autonomous		0.826			0.941			
Livestock raising	Autonomous		0.879			0.917			
Nonfarm business activity	Autonomous		0.803			0.939			
Own wage or salaried employment	Autonomous		0.810			0.915			
Minor household expenditures	Autonomous		0.880			0.923			
Own health problems	Autonomous		0.848			0.903			
Protection from violence	Autonomous		0.681			0.929			
Expression of religion	Autonomous		0.877			0.905			
Daily tasks	Autonomous		0.921			0.947			
Family planning	Autonomous		0.896			0.865			

Source: Authors' calculations based on Ahmed (2013).
Note: Only factor loadings greater than or equal to 0.300 are shown.

Table A.3 Results of exploratory factor analysis considering only agricultural domains of decision making, by gender, Bangladesh

		Women			Men		
Domain	**Subscale**	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 1**	**Factor 2**	**Factor 3**
Agricultural production	External	0.957			0.920		
Purchase of agricultural inputs	External	0.954			0.885		
Types of crops to grow	External	0.959			0.861		
Who takes crops to market or when	External	0.933			0.769		
Livestock raising	External	0.898			0.773		
Agricultural production	Introjected			0.844			0.784
Purchase of agricultural inputs	Introjected			0.859			0.786
Types of crops to grow	Introjected			0.849			0.806
Who takes crops to market or when	Introjected			0.793			0.747
Livestock raising	Introjected			0.703			0.733
Agricultural production	Autonomous		0.916			0.952	
Purchase of agricultural inputs	Autonomous		0.940			0.953	
Types of crops to grow	Autonomous		0.935			0.946	
Who takes crops to market or when	Autonomous		0.928			0.915	
Livestock raising	Autonomous		0.882			0.914	

Source: Authors' calculations based on Ahmed (2013).
Note: Only factor loadings greater than or equal to 0.300 are shown.

Table A.4 Results of exploratory factor analysis considering only personal domains of decision making, by gender, Bangladesh

		Women			Men		
Domain	**Subscale**	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 1**	**Factor 2**	**Factor 3**
Own health problems	External		0.893		0.718		
Protection from violence	External		0.887		0.763		
Expression of religion	External		0.870		0.615		
Daily tasks	External		0.833		0.787		
Family planning	External		0.893		0.789		
Own health problems	Introjected			0.723	0.695		
Protection from violence	Introjected			0.718	0.693		
Expression of religion	Introjected			0.649	0.696		
Daily tasks	Introjected			0.760	0.717		
Family planning	Introjected			0.760	0.690		
Own health problems	Autonomous	0.921				0.905	
Protection from violence	Autonomous	0.909				0.857	
Expression of religion	Autonomous	0.886				0.877	
Daily tasks	Autonomous	0.936				0.920	
Family planning	Autonomous	0.908				0.890	

Source: Authors' calculations based on Ahmed (2013).
Note: Only factor loadings greater than or equal to 0.300 are shown.

Table A.5 Results of exploratory factor analysis considering all domains of decision making, by gender, Ghana

		Women			Men		
Domain	**Subscale**	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 1**	**Factor 2**	**Factor 3**
Agricultural production	External	0.864			0.864		
Purchase of agricultural inputs	External	0.900			0.900		
Types of crops to grow	External	0.898			0.898		
Who takes crops to market or when	External	0.874			0.874		
Livestock raising	External	0.879			0.879		
Nonfarm business activity	External	0.860			0.860		
Own wage or salaried employment	External	0.894			0.894		
Major household expenditures	External	0.891			0.891		
Minor household expenditures	External	0.771			0.771		
Agricultural production	Introjected		0.826			0.826	
Purchase of agricultural inputs	Introjected		0.877			0.877	
Types of crops to grow	Introjected		0.860			0.860	
Who takes crops to market or when	Introjected		0.815			0.815	
Livestock raising	Introjected		0.887			0.887	
Nonfarm business activity	Introjected		0.895			0.895	
Own wage or salaried employment	Introjected		0.909			0.909	
Major household expenditures	Introjected		0.903			0.903	
Minor household expenditures	Introjected		0.807			0.807	
Agricultural production	Autonomous			0.884			0.884
Purchase of agricultural inputs	Autonomous			0.898			0.898
Types of crops to grow	Autonomous			0.887			0.887
Who takes crops to market or when	Autonomous			0.848			0.848
Livestock raising	Autonomous			0.893			0.893
Nonfarm business activity	Autonomous			0.902			0.902
Own wage or salaried employment	Autonomous			0.931			0.931
Major household expenditures	Autonomous			0.860			0.860
Minor household expenditures	Autonomous			0.798			0.798

Source: Authors' calculations based on USAID (2013).
Note: Only factor loadings greater than or equal to 0.300 are shown.

Table A.6 Results of exploratory factor analysis considering only agricultural domains of decision making, by gender, Ghana

		Women			Men		
Domain	**Subscale**	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 1**	**Factor 2**	**Factor 3**
Agricultural production	External	0.879			0.879		
Purchase of agricultural inputs	External	0.926			0.926		
Types of crops to grow	External	0.922			0.922		
Who takes crops to market or when	External	0.880			0.880		
Livestock raising	External	0.839			0.839		
Agricultural production	Introjected		0.853			0.853	
Purchase of agricultural inputs	Introjected		0.916			0.916	
Types of crops to grow	Introjected		0.900			0.900	
Who takes crops to market or when	Introjected		0.830			0.830	
Livestock raising	Introjected		0.883			0.883	
Agricultural production	Autonomous			0.905			0.905
Purchase of agricultural inputs	Autonomous			0.930			0.930
Types of crops to grow	Autonomous			0.906			0.906
Who takes crops to market or when	Autonomous			0.849			0.849
Livestock raising	Autonomous			0.865			0.865

Source: Authors' calculations based on USAID (2013).
Note: Only factor loadings greater than or equal to 0.300 are shown.

Table A.7 Spearman correlations between motivation subscales by domain and gender, Bangladesh

		Women		Men	
Domain	**Subscale**	**External**	**Introjected**	**External**	**Introjected**
Agricultural production	Introjected	0.196***		0.431***	
	Autonomous	0.234***	0.030	0.018	-0.001
Purchase of agricultural inputs	Introjected	0.217***		0.402***	
	Autonomous	0.262***	0.039†	-0.004	-0.022
Types of crops to grow	Introjected	0.238***		0.435***	
	Autonomous	0.253***	0.052*	-0.014	-0.069***
Who takes crops to market or when	Introjected	0.254***		0.431***	
	Autonomous	0.238***	0.047*	-0.071***	-0.046*
Livestock raising	Introjected	0.313***		0.461***	
	Autonomous	0.203***	0.057**	-0.018	-0.074***
Nonfarm business activity	Introjected	0.179***		0.474***	
	Autonomous	0.344***	0.069**	-0.094***	-0.061**
Own wage or salaried employment	Introjected	0.231***		0.491***	
	Autonomous	0.271***	0.022	-0.023	-0.035†
Minor household expenditures	Introjected	0.355***		0.490***	
	Autonomous	0.183***	0.077***	-0.112***	-0.020
Own health problems	Introjected	0.373***		0.469***	
	Autonomous	0.228***	0.071***	0.049**	-0.022
Protection from violence	Introjected	0.236***		0.456***	
	Autonomous	0.209***	-0.029	0.072**	0.035
Expression of religion	Introjected	0.429***		0.519***	
	Autonomous	0.208***	0.068***	0.123***	0.035*
Daily tasks	Introjected	0.421***		0.502***	
	Autonomous	0.178***	0.103***	-0.058***	-0.026†
Family planning	Introjected	0.402***		0.555***	
	Autonomous	0.167***	0.030†	-0.046**	-0.060***

Source: Authors' calculations based on Ahmed (2013).
Note: †, *, **, and *** indicate statistical significance at the 90 percent, 95 percent, 99 percent, and 99.9 percent confidence levels, respectively.

Table A.8 Spearman correlations between motivation subscales by domain and gender, Ghana

		Women		Men	
Domain	**Subscale**	**External**	**Introjected**	**External**	**Introjected**
Agricultural production	Introjected	0.627***		0.599***	
	Autonomous	-0.098***	-0.033†	-0.043*	-0.012
Purchase of agricultural inputs	Introjected	0.634***		0.630***	
	Autonomous	-0.124***	-0.084***	-0.092***	-0.065***
Types of crops to grow	Introjected	0.636***		0.653***	
	Autonomous	-0.138***	-0.109***	-0.112***	-0.096***
Who takes crops to market or when	Introjected	0.680***		0.685***	
	Autonomous	-0.077***	-0.078***	-0.057**	-0.051**
Livestock raising	Introjected	0.656***		0.641***	
	Autonomous	-0.085***	-0.056**	-0.077***	-0.041*
Nonfarm business activity	Introjected	0.638***		0.643***	
	Autonomous	-0.036†	-0.021	-0.007	0.034†
Own wage or salaried employment	Introjected	0.665***		0.654***	
	Autonomous	-0.002**	0.022	-0.000	0.038†
Major household expenditures	Introjected	0.658***		0.644***	
	Autonomous	-0.061**	0.034†	-0.051**	-0.019
Minor household expenditures	Introjected	0.672***		0.650***	
	Autonomous	-0.030	-0.005	-0.001	0.021

Source: Authors' calculations based on USAID (2013).
Note: †, *, **, and *** indicate statistical significance at the 90 percent, 95 percent, 99 percent, and 99.9 percent confidence levels, respectively.

Table A.9 Domain-specific ordinary least squares regression results predicting Relative Autonomy Index scores for agricultural decisions, by gender, Bangladesh

	Agricultural production		Purchase of inputs		Crop choice		Marketing of crops		Livestock raising	
Variable	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**
Sole decision making (β)	0.730	1.015*	0.689	0.861†	0.319	0.498	0.772	0.617	0.251	0.963*
	(0.558)	(0.495)	(0.579)	(0.505)	(0.580)	(0.495)	(0.545)	(0.485)	(0.364)	(0.378)
Joint decision making (γ)	0.830***	0.600	0.868***	0.527	0.642**	0.126	0.612*	0.114	0.559*	0.864*
	(0.220)	(0.562)	(0.228)	(0.580)	(0.215)	(0.551)	(0.243)	(0.558)	(0.274)	(0.389)
Age	-0.035	0.028	-0.035	0.010	-0.038	0.005	-0.054	0.015	0.001	0.009
	(0.042)	(0.033)	(0.042)	(0.036)	(0.038)	(0.036)	(0.044)	(0.035)	(0.037)	(0.036)
Age squared/1,000	0.585	-0.153	0.637	0.038	0.687	0.112	0.801	0.038	0.028	0.088
	(0.492)	(0.333)	(0.491)	(0.357)	(0.447)	(0.355)	(0.521)	(0.356)	(0.437)	(0.358)
Completed primary education	0.126	0.077	0.189	0.149	0.214	0.129	0.069	0.130	-0.211	0.202
	(0.192)	(0.186)	(0.201)	(0.195)	(0.189)	(0.198)	(0.206)	(0.203)	(0.198)	(0.186)
Higher than primary education	0.365	-0.703*	0.091	-0.597†	0.525	-0.576	0.004	-0.784*	0.408	-0.118
	(0.460)	(0.332)	(0.535)	(0.330)	(0.496)	(0.360)	(0.531)	(0.349)	(0.456)	(0.341)
Married	0.377	-0.394	0.088	-0.172	0.367	-0.543	0.235	-0.514	-0.032	-0.058
	(0.499)	(0.400)	(0.485)	(0.401)	(0.493)	(0.404)	(0.506)	(0.414)	(0.474)	(0.436)
Age gap: Husband - wife	0.004	-0.005	0.009	-0.007	0.006	-0.003	0.004	-0.006	-0.005	-0.014
	(0.010)	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)	(0.010)
Husband more educated than wife	-0.137	-0.193	-0.047	-0.119	-0.008	-0.205	-0.125	-0.074	0.188	-0.324†
	(0.153)	(0.171)	(0.173)	(0.187)	(0.154)	(0.187)	(0.178)	(0.198)	(0.148)	(0.184)
Muslim	0.189	-0.674†	-0.077	-0.844*	0.010	-0.847*	0.040	-0.757*	0.225	-0.742*
	(0.458)	(0.347)	(0.482)	(0.334)	(0.509)	(0.330)	(0.579)	(0.377)	(0.425)	(0.356)
(log) Area of cultivated land	-0.077	0.636*	-0.208	0.828**	-0.100	0.902**	-0.019	0.565†	-0.262	0.694*
	(0.339)	(0.298)	(0.344)	(0.290)	(0.393)	(0.307)	(0.400)	(0.308)	(0.337)	(0.285)
(log) Per capita consumption	0.197	0.899***	0.190	0.758***	0.105	0.729***	0.179	0.666***	0.268	0.870***
	(0.179)	(0.173)	(0.178)	(0.169)	(0.184)	(0.177)	(0.202)	(0.181)	(0.184)	(0.188)
Adjusted R-squared	0.015	0.028	0.016	0.026	0.009	0.026	0.005	0.022	0.003	0.033
H_0: β = γ (F-statistic)	0.033	2.695	0.095	1.634	0.307	2.070	0.079	3.595†	1.253	0.168
Observations	2,269	2,803	2,234	2,769	2,250	2,765	2,110	2,559	2,764	2,703

Source: Authors' calculations based on Ahmed (2013).
Note: †, *, **, and *** indicate statistical significance at the 90 percent, 95 percent, 99 percent, and 99.9 percent confidence levels, respectively.

Table A.10 Domain-specific ordinary least squares regression results predicting Relative Autonomy Index scores for nonagricultural decisions, by gender, Bangladesh

	Nonfarm business activity		Own wage or salaried employment		Minor household expenditures		Own health problems		Protection from violence		Expression of religion		Daily tasks		Family planning	
Variable	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**
Sole decision	0.583	0.827*	0.891*	1.734**	0.423	1.221**	0.596†	0.600	1.408**	0.676†	0.179	0.716	0.318	0.435	0.065	1.561***
making (β)	(0.511)	(0.399)	(0.408)	(0.561)	(0.257)	(0.417)	(0.335)	(0.366)	(0.435)	(0.364)	(0.408)	(0.852)	(0.373)	(0.518)	(0.546)	(0.460)
Joint decision	0.987***	0.504	1.331***	1.113†	0.204	0.458	0.342	0.146	1.088**	0.046	-0.399	-1.024	-0.617	-1.076*	0.441	-0.002
making (γ)	(0.258)	(0.455)	(0.318)	(0.616)	(0.222)	(0.408)	(0.261)	(0.366)	(0.403)	(0.347)	(0.376)	(0.824)	(0.388)	(0.515)	(0.499)	(0.376)
Age	0.081†	0.095*	-0.020	-0.030	0.008	0.006	-0.013	-0.004	0.056	0.019	-0.005	-0.016	0.003	0.007	-0.020	-0.027
	(0.043)	(0.043)	(0.039)	(0.036)	(0.027)	(0.024)	(0.026)	(0.026)	(0.060)	(0.043)	(0.034)	(0.028)	(0.030)	(0.026)	(0.032)	(0.032)
Age squared/1,000	-0.953†	-0.980*	0.400	0.377	-0.003	0.038	0.202	0.160	-0.758	-0.019	0.195	0.411	0.026	0.048	0.164	0.360
	(0.523)	(0.449)	(0.442)	(0.382)	(0.307)	(0.238)	(0.302)	(0.256)	(0.741)	(0.434)	(0.392)	(0.278)	(0.342)	(0.262)	(0.393)	(0.330)
Completed primary	-0.019	0.079	0.110	0.074	-0.073	0.094	-0.073	0.124	0.373	0.180	0.113	0.025	-0.127	0.062	-0.131	-0.042
education	(0.236)	(0.234)	(0.220)	(0.203)	(0.152)	(0.148)	(0.152)	(0.150)	(0.240)	(0.249)	(0.167)	(0.165)	(0.152)	(0.145)	(0.169)	(0.180)
Higher than primary	0.855	-0.267	1.583**	-0.163	0.140	-0.570*	0.089	-0.540*	-0.003	-1.091**	0.673	-0.580†	0.222	-0.492†	0.174	-0.513
education	(0.655)	(0.388)	(0.598)	(0.449)	(0.420)	(0.287)	(0.431)	(0.269)	(0.568)	(0.381)	(0.466)	(0.301)	(0.387)	(0.281)	(0.414)	(0.333)
Married	-0.333	-1.416**	-0.727	0.042	-0.376	-0.209	-0.462	-0.187	-0.670	0.083	-0.412	0.240	0.273	0.257	0.542	-0.066
	(0.867)	(0.439)	(0.573)	(0.418)	(0.345)	(0.316)	(0.361)	(0.320)	(0.551)	(0.647)	(0.423)	(0.345)	(0.398)	(0.335)	(1.024)	(0.833)
Age gap: Husband - wife	0.004	0.015	0.013	0.002	0.007	-0.006	0.004	-0.008	-0.004	-0.012	0.003	-0.013†	-0.003	-0.006	0.008	-0.022†
	(0.016)	(0.011)	(0.010)	(0.010)	(0.006)	(0.007)	(0.006)	(0.008)	(0.011)	(0.013)	(0.007)	(0.008)	(0.006)	(0.007)	(0.008)	(0.012)
Husband more	0.273	-0.057	0.476**	0.167	0.057	0.074	-0.026	-0.108	-0.505*	-0.007	-0.046	0.092	0.084	-0.034	-0.017	-0.230
educated than wife	(0.208)	(0.220)	(0.159)	(0.197)	(0.127)	(0.149)	(0.126)	(0.146)	(0.228)	(0.246)	(0.138)	(0.162)	(0.121)	(0.155)	(0.134)	(0.184)
Muslim	-0.084	-0.498	-0.229	-0.537†	0.068	-0.505†	-0.013	-0.390	-0.834†	-0.345	-0.350	-0.447	0.139	-0.630*	-0.096	-0.501
	(0.455)	(0.351)	(0.455)	(0.306)	(0.350)	(0.290)	(0.351)	(0.300)	(0.445)	(0.400)	(0.368)	(0.368)	(0.348)	(0.301)	(0.401)	(0.366)
(log) Area of	-0.649	0.416	-0.336	1.163***	-0.442†	0.218	-0.437†	0.149	0.536	0.631	-0.243	0.252	-0.325	0.423†	-0.446	-0.227
cultivated land	(0.413)	(0.371)	(0.422)	(0.339)	(0.262)	(0.232)	(0.257)	(0.266)	(0.341)	(0.392)	(0.316)	(0.285)	(0.270)	(0.253)	(0.314)	(0.306)
(log) Per capita	0.651**	1.001***	0.383	1.033***	0.209	0.881***	0.168	0.768***	0.008	1.529***	0.280	0.550**	0.315†	0.620***	0.255	0.598**
consumption	(0.235)	(0.226)	(0.242)	(0.201)	(0.164)	(0.148)	(0.157)	(0.170)	(0.230)	(0.236)	(0.188)	(0.192)	(0.163)	(0.171)	(0.180)	(0.188)
Adjusted R-squared	0.028	0.024	0.040	0.032	0.002	0.029	0.002	0.017	0.037	0.054	0.007	0.030	0.015	0.032	0.003	0.029
H_0: β = γ (F-statistic)	0.710	1.450	1.970	4.098†	1.061	12.969***	0.626	4.574*	0.908	4.379*	7.795**	43.732***	19.571***	53.776***	1.651	25.262***
Observations	1,282	2,059	1,536	2,501	4,218	4,473	3,918	3,939	1,081	1,529	3,106	3,776	4,202	4,217	3,476	3,349

Source: Authors' calculations based on Ahmed (2013).

Note: †, *, **, and *** indicate statistical significance at the 90 percent, 95 percent, 99 percent, and 99.9 percent confidence levels, respectively.

Table A.11 Domain-specific ordinary least squares regression results predicting Relative Autonomy Index scores for agricultural decisions, by gender, Ghana

	Agricultural production		Purchase of inputs		Crop choice		Marketing of crops		Livestock raising	
Variable	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**
Sole decision making (β)	0.475	1.758**	0.336	1.884**	0.682	2.065***	1.545***	0.227	0.389	1.058*
	(0.595)	(0.534)	(0.535)	(0.590)	(0.456)	(0.557)	(0.339)	(0.410)	(0.516)	(0.508)
Joint decision making (γ)	0.435†	1.471**	0.318	1.466*	0.142	1.514**	0.159	-0.265	0.311	0.634
	(0.253)	(0.522)	(0.256)	(0.593)	(0.260)	(0.543)	(0.271)	(0.419)	(0.285)	(0.534)
Age	-0.011	-0.032	-0.034	-0.036	-0.029	-0.053†	-0.067	-0.018	-0.043	-0.012
	(0.041)	(0.031)	(0.042)	(0.031)	(0.042)	(0.030)	(0.043)	(0.034)	(0.045)	(0.033)
Age squared/1,000	0.117	0.284	0.327	0.334	0.352	0.469	0.714	0.135	0.617	0.136
	(0.473)	(0.301)	(0.475)	(0.297)	(0.478)	(0.289)	(0.490)	(0.331)	(0.501)	(0.323)
Completed primary education	0.341	-0.170	0.550	0.617	0.830†	0.394	1.128*	0.776	0.443	0.621
	(0.535)	(0.595)	(0.522)	(0.532)	(0.493)	(0.568)	(0.502)	(0.633)	(0.642)	(0.588)
Completed higher than primary education	0.274	0.660	0.253	1.296*	0.415	1.075†	0.368	1.371*	0.760	1.444*
	(0.701)	(0.576)	(0.681)	(0.535)	(0.611)	(0.606)	(0.618)	(0.645)	(0.803)	(0.682)
Married	-1.439†	-0.703	-0.791	-0.502	-0.386	-0.752†	-0.406	-0.434	-0.594	-0.897†
	(0.738)	(0.434)	(0.739)	(0.439)	(0.746)	(0.437)	(0.749)	(0.503)	(0.857)	(0.520)
Age gap: Husband - wife	0.010	0.006	0.003	0.004	0.007	0.009	0.011	0.009	0.005	0.005
	(0.009)	(0.011)	(0.009)	(0.011)	(0.008)	(0.010)	(0.008)	(0.011)	(0.011)	(0.011)
Husband more educated than wife	0.228	-0.130	0.216	-0.704	0.368	-0.403	0.448	-0.945	0.375	-0.740
	(0.303)	(0.565)	(0.302)	(0.495)	(0.288)	(0.550)	(0.299)	(0.623)	(0.335)	(0.579)
Christian	0.508†	0.475†	0.653*	0.441†	0.623*	0.484†	0.837**	0.321	0.543†	0.415
	(0.279)	(0.255)	(0.260)	(0.244)	(0.281)	(0.257)	(0.289)	(0.258)	(0.296)	(0.265)
Muslim	-0.409	-0.308	-0.086	-0.380	-0.149	-0.333	-0.280	-0.394	-0.118	-0.009
	(0.321)	(0.304)	(0.317)	(0.285)	(0.319)	(0.297)	(0.314)	(0.298)	(0.366)	(0.314)
(log) Area of cultivated land	0.068	0.208	0.175	0.301†	0.234	0.388*	0.620**	0.586**	0.250	0.499**
	(0.211)	(0.192)	(0.213)	(0.178)	(0.196)	(0.181)	(0.204)	(0.186)	(0.201)	(0.183)
(log) Per capita consumption	-0.413**	-0.389**	-0.420**	-0.372*	-0.500**	-0.387**	-0.596***	-0.322*	-0.611***	-0.491***
	(0.147)	(0.143)	(0.155)	(0.144)	(0.152)	(0.148)	(0.152)	(0.151)	(0.164)	(0.143)
Ethnicity dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.027	0.025	0.025	0.028	0.031	0.033	0.047	0.026	0.028	0.028
H_0: β = γ (F-statistic)	0.005	1.485	0.001	3.280†	1.398	5.738*	15.150***	3.801†	0.021	2.741†
Observations	2,392	2,410	2,369	2,385	2,380	2,400	2,108	2,140	1,863	1,912

Source: Authors' calculations based on USAID (2013).

Note: Robust standard errors, clustered at the primary sampling unit level, shown in parentheses. †, *, **, and *** indicate statistical significance at the 90 percent, 95 percent, 99 percent, and 99.9 percent confidence levels, respectively.

Table A.12 Domain-specific ordinary least squares regression results predicting Relative Autonomy Index scores for nonagricultural decisions, by gender, Ghana

	Nonfarm business activity		Own wage/ salaried employment		Major household expenditures		Minor household expenditures	
Variable	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**
Sole decision making (β)	2.957***	-0.680*	1.189†	-0.704	-0.893	0.483	2.225***	-1.707***
	(0.423)	(0.299)	(0.625)	(0.512)	(0.656)	(0.691)	(0.351)	(0.257)
Joint decision making (γ)	1.517**	-0.774*	0.759	-1.469*	0.750*	0.527	1.484***	-1.048***
	(0.463)	(0.343)	(0.509)	(0.583)	(0.349)	(0.690)	(0.320)	(0.246)
Age	-0.102†	0.030	0.045	0.083	0.026	0.021	-0.039	-0.014
	(0.060)	(0.042)	(0.103)	(0.071)	(0.051)	(0.048)	(0.035)	(0.028)
Age squared	1.196†	-0.249	-0.489	-0.936	-0.157	-0.160	0.438	0.078
	(0.681)	(0.416)	(1.235)	(0.668)	(0.597)	(0.467)	(0.402)	(0.279)
Completed primary education	0.792	-0.680	-0.685	-0.387	0.063	0.321	0.287	0.512
	(0.513)	(0.623)	(0.686)	(0.691)	(0.480)	(0.632)	(0.401)	(0.493)
Completed higher than primary education	0.412	-0.073	-0.633	-0.460	-0.115	0.469	0.453	0.538
	(0.601)	(0.525)	(0.700)	(0.567)	(0.520)	(0.458)	(0.411)	(0.407)
Married	-0.385	-0.803	-0.402	-0.677	-0.690	0.096	-0.373	-0.052
	(0.856)	(0.599)	(1.221)	(1.112)	(0.805)	(0.697)	(0.679)	(0.438)
Age gap: Husband - wife	0.005	0.018	-0.010	-0.019	0.010	-0.011	0.013†	0.006
	(0.013)	(0.015)	(0.017)	(0.019)	(0.013)	(0.015)	(0.008)	(0.011)
Husband more educated than wife	0.222	0.251	0.520	0.080	0.219	-0.028	0.542*	-0.185
	(0.374)	(0.553)	(0.533)	(0.519)	(0.360)	(0.490)	(0.270)	(0.403)
Christian	0.806†	-0.006	1.790*	1.765**	0.728†	0.037	0.777**	0.532*
	(0.467)	(0.365)	(0.887)	(0.631)	(0.412)	(0.361)	(0.271)	(0.251)
Muslim	-0.039	-0.787†	0.548	0.205	0.274	-0.208	0.069	-0.075
	(0.466)	(0.413)	(0.798)	(0.690)	(0.415)	(0.365)	(0.298)	(0.274)
(log) Area of cultivated land	0.493†	0.283	-0.185	0.199	0.252	0.368	0.319†	0.269†
	(0.252)	(0.255)	(0.438)	(0.393)	(0.292)	(0.235)	(0.163)	(0.154)
(log) Per capita consumption	-0.388†	-0.185	-0.009	0.285	0.313	0.343†	-0.157	-0.221†
	(0.198)	(0.167)	(0.291)	(0.275)	(0.216)	(0.191)	(0.125)	(0.122)
Ethnicity dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.087	0.025	0.044	0.021	0.013	0.015	0.062	0.043
H_0: β = γ (F-statistic)	12.708***	0.076	0.422	2.285	5.273*	0.020	8.032**	8.298**
Observations	1,277	1,148	382	430	1,008	1,027	2,546	2,575

Source: Authors' calculations based on USAID (2013).

Note: Robust standard errors, clustered at the primary sampling unit level, shown in parentheses. †, *, **, and *** indicate statistical significance at the 90 percent, 95 percent, 99 percent, and 99.9 percent confidence levels, respectively.

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