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ORIGINAL PAPER

Friends in the village:do they matter for women's involvement in household decisions?

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Abstract
It is often assumed that social connections are good for female empowerment in developing countries. However, growing evidence suggests that empowered women may face backlash from their spouse. In this paper, we analyze how the number of friends that wives have in their village affects the wives' involvement in household decisions about their own health and their children's health. To do so, we use data from 700 couples in 30 villages in rural Tanzania. We estimate the effect of the number of friends on the wife's involvement in household decisions using a multinomial logit regression combined with a control function that deals with potential endogeneity bias. We find that wives with more friends are less likely to make decisions jointly with their husband, and are more likely to report that their husband makes decisions without their involvement. We further explore whether the effects depend on the "type" of friends, as defined by their gender and whether they are shared with the husband.

Keywords Intra-household decision-making · Social networks · Rural Tanzania

JEL classification: D1

1 Introduction

It is often assumed that social connections are good for women's empowerment. The underlying idea is that women are stronger if they are connected. Guided by this

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assumption, many development projects or programs provide women a space to come together in a group setting[1]. These groups are not only used to facilitate the operations of development projects (e.g., to transfer economic resources or generate knowledge exchange), but are also thought to improve the bargaining power of women (Brody et al. 2015). If women are stronger when they are connected, more informal connections, such as friends within the village, might also support women's empowerment. Compared to women's groups, which often transcend the village boundary, within-village friends have the advantage that they require less mobility and hence are a more accessible option for most women.

If more connections increase women's empowerment, it is important to understand how empowerment translates to the household level. We are particularly interested in how social connections influence women's involvement in household decisions, as this has been shown to be beneficial for women and their children (Duflo 2003; Duflo and Udry 2004; Haddad et al. 1997; Hoddinott and Haddad 1995; Thomas 1990, 1993; Fantahun et al. 2007; Westeneng and D'Exelle 2015). We are interested in household decisions in the health domain, as these have obviously important implications for the well-being of household members. At the same time, there is abundant evidence that women often lack control over their own health and the health of their children. This has for example been documented by the large literature on reproductive health. Most women do not have complete control about decisions such as when and how many children to have, and whether and where to seek prenatal and delivery care (Doepke and Tertilt 2018; D'Exelle and Ringdal 2022). Lack of control in this domain has a direct influence on the health and survival prospects of themselves and their (unborn) child (see, e.g., Becker (1996); Urassa et al. (1997); Li et al. (2021)).

To analyze the influence of the number of friends women have in their village on their involvement in health decisions, we develop a theoretical model that generates the following hypotheses. Our main hypothesis is that women with more friends are less likely to be involved in household decisions. This is due to a reaction by the husband who takes control of the household decisions if his wife, supported by her social networks, becomes too demanding in the household negotiations for his liking. We also hypothesize that the effect of the wife's number of friends on her involvement in household decisions is stronger if the friends are not shared with the husband and/or if the friends are female, as these types of friends provide better access to more useful information. The reasoning is that information flows better between people of the same gender, and friends who are not shared with the husband may provide information that the husband does not have access to, and hence be more useful in the negotiations with their husband (e.g., to develop informed and convincing arguments, show better knowledge than her husband).

To investigate these hypotheses, we use data from a sample of 700 married or cohabiting couples in rural Tanzania. We interviewed both spouses of each sampled couple separately and in private. We collected information about their friendship relations in their village, and who was involved in household decisions about the health of the children and the health of themselves (the respondent). We selected these two areas, as

[1] These groups can have different purposes, such as the provision of micro-credit loans or agricultural extension services. Sometimes pre-existing groups are used, such as traditional rotating savings and credit associations (ROSCAs).

we expect that wives' involvement in the decision-making process increases their own health and the health of their children. At the same time, important differences might be observed as they differ in who is directly affected by the decisions (i.e., children's health has a public good nature). The optimal degree of wives' involvement might also differ between both areas. For example, while being dependent on the husband to make decisions might not be good for the wife's health, too little involvement of the husband is arguably not good for decisions about children's health.

To estimate the effect of the number of friends on wives' participation in household decisions, we use a multinomial logit regression model combined with a control function that deals with potential endogeneity bias. As an instrumental variable in the control function, we use the predicted size of the individual friendship network obtained with a dyadic regression that utilizes a set of exogenous variables.

Our results are summarized as follows. First, wives with more friends in their village are less likely to make decisions jointly with their husbands. Second, decisions about the children's health are then more likely taken by the husband alone or by the wife alone, and decisions about the wife's health are more likely taken by the husband alone. Third, the effect on child health decisions does not depend on whether friends are shared with the husband. For decisions about the wife's health, some of the effects are stronger when friends are not shared with the husband. Fourth, the effects on the decisions about children's health are driven by female friends. The negative effect on the likelihood of joint decisions about the wife's health is stronger when friends are female. The results are robust to a range of extensions, which include an alternative definition of friendship ties and the use of the husband's reports. We also generate additional support for the backlash mechanism by extending the analysis beyond the health domain and looking at the effect on intimate partner violence (IPV), which tends to be closely related with husbands' controlling behavior (Donald et al. 2021).

Our paper contributes to two strands of literature. First, it relates to the literature that documents the relationship between social connections and female empowerment. Studies in Bangladesh and India have shown that participation in women's groups increases women's involvement in household decisions (Desai and Joshi 2014; Holvoet 2005; Mukherjee and Kundu 2012; Pitt et al. 2006). Few studies have studied the effect of social connections outside of a formal group. Moreover, these studies do not look at the size of the network, as we do. Instead, they consider the characteristics of women's networks, such as the proportion of the network that has the final say on household decisions or the proportion of the network that participates in an empowerment program (Desai and Johnson 2005; Kandpal and Baylis 2019). Ngenzebuke et al. (2018) comes closest to our study. They show that the size of women's kinship networks in Burundi increases their decision-making power in the household. Our focus is on friendship networks, which can be more easily changed than kinship networks. In addition, no study that we are aware of has taken into account the gender of women's connections and whether they are shared with the husband, which we do. Second, our study also contributes to the growing evidence on female empowerment and male backlash. This literature has focused mainly on how women who are empowered by social groups or income-generating activities are more likely to face IPV at home (Bhalotra et al. 2021; Bulte and Lensink 2019; Caridad Bueno and Henderson

2017; Eggers Del Campo and Steinert 2020; Schuler et al. 1996). We contribute to this literature an analysis of how backlash affects household decision-making.

The rest of the paper is structured as follows. Section 2 presents a conceptual framework and our main hypotheses. Section 3 presents the data, some descriptives of key variables and correlations between the number of friends and household decision-making. Section 4 reports regression results, while Sect. 5 discusses the results and concludes.

2 Theory and hypotheses

To predict the effect of the wife's number of friends on spousal involvement in household decisions, we develop a theoretical model. Consider a household with two spouses $i \in \{w, h\}$, where w represents the wife and h represents the husband. Each spouse has to decide whether to participate in the household decision. For this, they choose the option that maximizes their individual utility U_i, which depends on the household decision outcome that is chosen. This leads to three different outcomes: both spouses participate (JD), only the wife decides (WD), or only the husband decides (HD), as presented in the game tree below (see Fig. 1).

We make the following assumptions. First, we assume that spouses have different preferences about the household decision outcome. If they had the same preference, they would make the same decision and it would not matter who was involved in the decision. Second, we assume that the wife will take the decision if the husband decides not to participate. Given our focus on women's and children's health in this paper, this is a realistic assumption. Third, given the patriarchal nature of Tanzanian society, we assume husbands are first movers.

If both spouses decide to participate in the decision, an agreement needs to be reached about the decision. Given spousal preference differences, we assume that

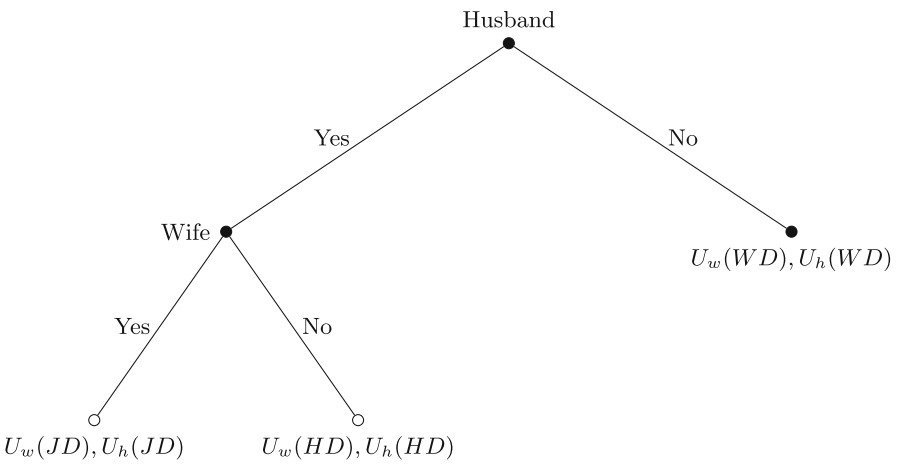

Fig. 1 Game tree

an agreement will give higher utility than what they would obtain if the decision was made by the other spouse, i.e., $U_w(JD) = U_w(HD) + J_w$ with $J_w > 0$ and $U_h(JD) = U_h(WD) + J_h$ with $J_h > 0$.

We also assume that J_w increases and J_h decreases with the wife's *voice* in the household discussions around the joint decision, captured by $\lambda = F(n)$, with n being the number of friends, and $F'(n) > 0$ and $F''(n) < 0$. A larger network gives access to more information that the wife can use in the discussions[2]. For example, the wife might know more about the health services provided in the area, and are therefore better at finding informed arguments in support of her preferred decision outcome[3].

If they do not reach an agreement, we assume that the husband takes the decision, and there is a cost C to both spouses, in the form of a deterioration of the spousal relation. More formally, the utility obtained under joint decision has two outcomes, for each spouse:

$$U_w(JD) = \begin{cases} U_w(HD) + J_w & \text{if agreement} \\ U_w(HD) - C_w & \text{if disagreement} \end{cases} \tag{1}$$

$$U_h(JD) = \begin{cases} U_h(WD) + J_h & \text{if agreement} \\ U_h(HD) - C_h & \text{if disagreement} \end{cases} \tag{2}$$

The husband will step out of the negotiations if $U_h(WD) + J_h < U_h(HD) - C_h$. Given that the husband will take the decision if negotiations fail, the wife will never step out of the negotiations, as this will make her worse off, i.e., it always holds that $U_w(HD) + J_w > U_w(HD) - C_w$.

To find possible equilibria, we identify the best response of each spouse. First, if the husband participates, the wife's best response is to participate if $U_w(JD) > U_w(HD)$. Second, if the wife participates, the husband's best response is to participate if $U_h(JD) > U_h(WD)$. If both conditions hold, JD would be an equilibrium. If an agreement is reached, it can be shown that both conditions hold. However, if no agreement is reached, $U_w(JD) < U_w(HD)$, and the wife will not participate in the decision process and leave the decision to her husband. HD would be the equilibrium in that case.

We now look at the effect of the wife's number of friends. We assume that having more friends gives the wife a stronger voice in the discussions with her husband, which increases J_w and decrease J_h. With sufficiently strong voice, $U_h(WD) + J_h < U_h(HD) - C_h$, such that the husband is better off stepping out of the negotiations, and pushing through his own decision. If the wife anticipates this will happen, she might prefer not to participate in the decision as $U_w(JD) = U_w(HD) - C_w < U_w(HD)$.

[2] There is a large theoretical literature in economics that looks at the number of connections in a network as source of bargaining power. Most models predict that the number of connections increases bargaining power as it influences the likelihood of being selected as bargaining partner (see, e.g., Calvo-Armengol (2001)). However, such endogenous selection of partners is not a realistic option for bargaining between spouses.

[3] Note that we do not focus on the effect of the behavior or attitudes within the respondent's networks, i.e., peer effects. We are solely interested in the effect of the size of the social network within the village. See Kandpal and Baylis (2019) on peer effects in female autonomy.

In other words, she would let the husband take the decision, to avoid the disagreement cost C_w. This brings us to our first hypothesis.

Hypothesis 1: *Having more friends decreases the likelihood that the wife is involved in household decisions.*

In a final step, we look at the type of friends, as this might influence the strength of the effect of women's number of friends. In contrast to women's groups, friendship ties can be of mixed gender and can be shared with the spouse. Both aspects might have an influence on the effect of the wife's number of friends. We expect "unique friends"—i.e., friends not shared with the husband—to be more important in increasing the wife's voice in the negotiations with the husband. The reason is that friends who are not shared with the husband may provide the wife with information that her husband does not have, and hence be more useful in the negotiations with her husband. In terms of the gender of friends, we assume that information flows better among people of the same gender. This would make female friends more instrumental for the wife than male friends. This leads to a second hypothesis.

Hypothesis 2: *The effect of women's number of friends is stronger if friends are not shared with the husband and/or the friends are female.*

Two notes are needed on the assumptions made in our model. First, we have assumed that C_h and C_w are determined outside the model. Making them endogenous will not change the predictions, as long as they do not depend on the wife's network size. It is realistic to assume that C_w is much larger than C_h. Husbands tend to have a better economic position and often transfer economic resources to their wife. This gives them the option to withhold economic support from their wife. They can also resort to intimate partner violence (IPV). The wife tends to have little influence on the cost incurred by her husband C_h. She can decide to divorce, which might substantially increase the cost for the husband; however, as this would also substantially increase the cost to herself, it would only be used in an extreme case (e.g., after prolonged abuse and when facing risks to her own life). Therefore, this option is not included in the model.

Second, this is a simplified model, in at least two ways. We assume that interactions are captured in one round, and women are able to anticipate how the negotiations pan out. In reality, the effect of the wife's number of friends on her involvement in household decisions, might spread over multiple rounds, and women might have incomplete information about the husband's preferences. For example, women with a stronger voice assume an active role in the household decision in the first round, which (unexpectedly) backfires, and damages the spousal relation. In the second round, the same woman will then refrain from participating in the decision because of the threat of further backlash. Note that such interaction would still be in line with both hypotheses.

3 Data

3.1 Study region

Most of Tanzania, where our study took place, is patriarchal, such that the involvement of wives in household decisions is limited. For example, Nsenga and Mwaseba (2021) noted that in the southern highlands of Tanzania both spouses are commonly involved in household decisions, but the husband tends to make the final decision. Galiè et al. (2021) found in peri-urban parts of Kenya and Tanzania that decision-making authority is frequently attributed to the spouse who generates income, which tends to be the husband in many cases.

The study region is Misungwi district, which is located in the Mwanza region of northern Tanzania. Based on the most recent census before our study, this district has a population of 351,607 of which 90 percent live in rural settlements (Tanzania National Bureau of Statistics 2013. The majority of this district is populated by the Sukuma tribe which is a patrilineal tribe in which the responsibility of the husband is to provide for the family and the responsibility of the wife is to take care of their husband and children (Vats and Thomas 2015). Sukuma women have little decision-making autonomy. For example, as noted by Iddy (2021), Sukuma women could not participate in their study on female education without their husband's consent.

3.2 Data collection

In this district, we selected a sample of 700 married or cohabiting couples through multistage cluster sampling[4]. Of each selected couple, we interviewed both spouses separately and in private. We used same-sex enumerator-interviewee pairs to increase rapport between enumerators and respondents. The survey collected information about socio-demographic characteristics. Both spouses were also asked who was involved in household decisions about their health and their children's health. We also elicited the friendship relations of both spouses in their village. For this, we asked respondents to indicate their close friends from a list of spouses of all the sampled couples. Going systematically through this list, we first asked if they knew the person. If they did, we asked if they were a close friend[5]. To avoid order effects, we used a stack of cards, each one showing the names of the spouses of one couple. Enumerators reshuffled the stack of cards before each interview.

[4] From the Misungwi district, we randomly selected eight rural wards, then from each selected ward two villages were randomly selected, and finally two hamlets per village. In each of the selected hamlets we selected a random sample of 40 couples in which the wife had at least one living child and was 40 years old or younger. This survey was part of a larger project related to pregnancy, therefore the respondents needed to have had at least one successful pregnancy and be of childbearing age. If less than 40 couples were available in a hamlet, we selected all of them. Two of the 32 hamlets selected were used for piloting and not included in the final sample.

[5] They were also asked if they were relatives. We are aware that there might be some overlap between both types of social ties, as friends might also be relatives. As we focus on the effect of friendship ties, a look at their overlap and how it might influence results will be presented in an extension of our analysis.

3.3 Descriptives

Table 1 presents descriptive statistics. The average age of husbands is about 37 years and the average age of the wives is just over 30 years with an intra-couple age difference of about 6.5 years. The average years of education are statistically different between the spouses with husbands averaging half a year more than the wives. Only 28% of wives are from the village they are living in compared to 72% of husbands. This is due to the Sukuma tribe (to which 98% of the respondents belong) being patrilineal. This means that wives move where their husband lives once they are married. We also see that wives earn, on average, a little less than half the amount that husbands earn. The main income sources include selling crops, raising cattle, small animals, or poultry, and being employed by someone else. Crops and poultry are the most common activities for both wives and husbands. Fifteen percent of the wives in our sample and 18% of the husbands have been divorced. Thirty-three percent of the wives in the sample reported that they experienced intimate partner violence in the 6 months prior to the survey, defined as any of the following: the husband pushed, punched, dragged, forced sex, threatened, or humiliated her.

As for mobility, only 12% of wives had visited an urban center at least once in the 6 months prior to the survey compared to 32% of husbands. For those who had visited an urban center, wives averaged 2.8 visits in the 6 months prior to the survey compared to 6.3 visits for the husbands. As a measure for other social activities in the village, the respondents were asked if they participated in any projects or assistance groups in the 3 years prior to the survey. In our sample, 5% of each of the husbands and wives participated in a village project initiated by a group (government or non-government). Seventeen percent of the wives and 21% of the husbands had participated in such an assistance group for hardships (such as illness or funerals). Lastly, 10% of the wives and 9% of the husbands participated in a locally organized group that provides rotating loans.

To analyze the "friends" data we proceed as follows. First, we assume that two respondents have a friendship relation if both identified the other as a friend, commonly referred to as AND-ties. This limits over-reporting and only includes the strongest friendship ties. Second, we break down the social networks into unique and common friends as they may have a different influence on intra-household decision-making. Unique friends are friends of the husband or wife who are not friends with the spouse, therefore only friends with one spouse. Common friends are friends that are shared by both spouses. Third, we also break down the friendship ties by the gender of the friends, as different genders may have different influences on each spouse.

Table 1 reports the frequencies of the different categories. We find, on average, that wives have 1.0 friends and that husbands have 1.7 friends. Similar to other studies (e.g., D'Exelle and Holvoet (2011)) wives have significantly smaller friendship networks than husbands. Wives have, on average, 0.75 unique friends and husbands have 1.4 unique friends. These statistics indicate that for both husbands and wives, their networks are mostly comprised of unique friends rather than friends shared with their spouse. Additionally, as one would expect, wives tend to have mostly women in their networks and husbands have mostly male friends.

Table 1 Sample characteristics

	Wives		Husbands		
	Mean	St. dev.	Mean	St. dev.	*p*-value
Characteristics					
Age	30.4	9.0	36.9	10.6	0.000***
Years of education	5.0	3.1	5.4	3.0	0.02**
Born in village	28%		72%		0.000***
Annual income (TZS)[a]	306,589	778,894	641,654	1,334,697	0.000***
Income sources					
Crops	78%		91%		0.00***
Cattle	31%		31%		1.00
Small animals	31%		33%		0.36
Poultry	66%		70%		0.09*
Employment	36%		53%		0.00***
Divorced/separated at least once	15%		23%		
Intimate partner violence	33%		–		
At least 1 visit to an urban center in previous 6 months	12%		32%		0.00***
Participated in village project previous 3 years	5%		5%		0.54
Participated in village group for hardship assistance previous 3 years	17%		21%		0.04**
Participated in village group for loans previous 3 years	10%		9%		0.59
Social networks					
Total friends	1.0	2.0	1.7	2.8	0.00***
0 total friends	63%		47%		
1–2 total friends	23%		30%		
3+ total friends	14%		23%		0.00***
Unique friends	0.75	1.5	1.4	2.4	0.00***
0 unique friends	66%		50%		
1 unique friends	17%		20%		
2+ unique friends	17%		30%		0.55
Female friends	0.57	1.1	0.52	1.1	0.37
0 female friends	68%		74%		
1 female friend	18%		13%		
2+ female friends	14%		13%		0.00***
Male friends	0.47	1.1	1.2	1.9	0.00***
0 male friends	77%		51%		
1 male friend	12%		22%		
2+ male friends	11%		27%		0.00***

Table 1 continued

	Wives			Husbands		
	Mean	St. dev.		Mean	St. dev.	*p*-value
Decision-making[b]	HD	WD	JD	HD	WD	JD
Children's health	15%	15%	70%	45%	11%	44%
Respondent's health	25%	12%	63%	64%	19%	17%
	Household level					
	mean	st. dev.				
Duration of marriage	10.6	8.1				
Number of children under 12	3.0	1.5				

Notes: $N = 700$ except for husband's education ($N = 697$) and duration of marriage ($N = 664$). Two-sided *p*-values reported of an unpaired t-test (for continuous variables), a proportion test (for binary variables) or a chi-square test (for categorical variables). The *p*-values on the last row of the categories refer to a chi-square test that compares all categories of that variable. *JD*, both spouses participate; *WD*, only the wife decides; and *HD*, only the husband decides

Asterisks ***, **, and * indicate two-sided significance levels at 1, 5, and 10%, respectively

[a]Annual income measured in Tanzanian Shillings (TZS). At the time of the survey the exchange rate was 1 dollar = 2235 TZS

[b]Observations were removed where the answer was "someone else." This results in a sample of 693 women and 695 men for child health decisions and a sample of 695 women and 663 men for own health decisions

Next, we describe decision-making around the children's health and the respondent's health. The question used for the respondent's health is as follows: "Who usually makes decisions concerning your health? For example, when you should see a doctor, go to the clinic, buy medicine, etc." The question about children's health was asked in the same way. The answer options were: the respondent, the spouse, the spouses together or someone else. We removed observations where the answer was "someone else," as this was rarely used. Using wives' reports, the "spouses jointly" option was most frequently chosen, and the "husband alone" option was least frequently chosen. Using the husbands' reports, we see that most husbands reported that they made each of the decisions alone.

Lastly, looking at the household characteristics, we find that the average length of the marriage is 10.6 years at the time of the survey. The wives were, on average, 19.3 years old at the time of marriage, compared to an average of 25.8 years of age for the husbands. Couples in the sample have, on average, 3 children under the age of 12.

3.4 Household decision-making by number of friends

To analyze the association between the number of friends wives have in their village and household decision-making about the children's health and the wife's health, we plot wives' responses on the household decision-making questions over their number of friends (see Fig. 2). To measure the strength of the associations, the graphs also report the Spearman's rank correlation coefficient.

Looking at the correlation coefficients, in all but one of the correlations, we reject the null hypothesis of no correlation at the 1% significance level. The bar charts show

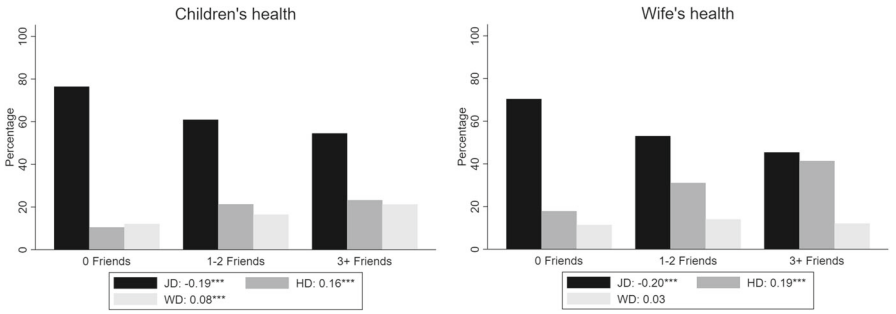

Fig. 2 Decision-making by number of friends

that wives with more friends are less likely to make either decision together with their spouse and are more likely to report that their spouse makes these decisions alone. Wives with more friends are also more likely to report making child health decisions alone.

4 Regressions

To identify the effect of the number of friends on intra-household decision-making, we use regression analysis. We start this section by explaining the econometric specifications that we will use, after which we present the regression results.

4.1 Econometric specification

To estimate the effect of the number of friends on the likelihood of each of the intra-household decision-making categories, we use a multinomial logit regression where y_i captures the decision-making category as reported by the wife i. These categories are: "spouses jointly" ($y_i = JD$), "husband alone" ($y_i = HD$) and "wife alone" ($y_i = WD$). We do not include respondents who used the fourth option "someone else" as this was rarely used. This leads to the following two regression equations:

$$ln\left(\frac{P(y_i = WD)}{P(y_i = JD)}\right) = \beta_0^{WD} + \beta_1^{WD}(\text{1-2 Friends})_i + \beta_2^{WD}(\text{3+ Friends})_i + \beta_3^{WD}C + \beta_4^{WD}\hat{\mu i}_i + \epsilon_i^{WD}$$

$$ln\left(\frac{P(y_i = HD)}{P(y_i = JD)}\right) = \beta_0^{HD} + \beta_1^{HD}(\text{1-2 Friends})_i + \beta_2^{HD}(\text{3+ Friends})_i + \beta_3^{HD}C + \beta_4^{HD}\hat{\mu i}_i + \epsilon_i^{HD}$$

β_1 and β_2 capture the effect of having 1–2 friends and 3+ friends, respectively, relative to having no friends. C is a set of control variables which includes hamlet size, the respondent's age, education, years living in the hamlet, and hamlet sampling rate. ϵ_i^{WD} and ϵ_i^{HD} are the error terms. Standard errors are adjusted for potential dependencies within hamlets, estimated with bootstrapping. Here we follow Cameron et al. (2008) who show that bootstrapping is preferable to clustering if the number of clusters is low, as in our case.

A potential risk to the identification of the effect of the number of friends is potential endogeneity bias, caused by the omission of confounding factors or reverse causality.

Both cases would lead to a correlation between the explanatory variables and the error term, and hence bias the estimates of the coefficients of the explanatory variables. We look at each in turn.

First, even though we will add a set of control variables, we might miss some important confounding factors, which would bias the estimates of our main explanatory variables. For example, wives who have more income might have more connections and at the same time more decision-power in their household. Second, endogeneity bias might also be caused by reverse causality. For example, wives with more bargaining power may bargain for more social time and hence make more friends. Or wives with less bargaining power or who face more intra-household conflict may develop larger social networks as a coping mechanism.

To deal with potential endogeneity bias, we use a control function. Similar to the two-stage least squares approach used in instrumental-variables regression it uses an instrumental variable, but instead of replacing the endogenous variable with the prediction of the first-stage, it adds the residual of the first-stage, represented by $\hat{\mu_i}$. While both approaches lead to the same result with linear models, the consistency of the control function approach is superior with non-linear models (Terza et al. 2008), such as our multinomial logit regression. It also has the advantage that the coefficient of $\hat{\mu_i}$ can be used as a heteroskedastic-robust Hausman test of endogeneity (Wooldridge 2015).

As an instrument, we use the predicted size of the individual friendship network obtained in the following way. In a first step, we predict individual friendship links at the village level, using a dyadic regression. The dyadic regression captures the exogenous influence of 'similarity' on individual characteristics (age, education and gender) and the minimum of the 'duration of residence' between two nodes living in the same village. Both are important determinants of network formation. We know from the sociological literature, for example, that homophily is an important force for the formation of social ties (see, e.g., McPherson et al. (2001), for a survey). As the formation of friendship takes time, we expect a friendship tie between two nodes to be more likely formed the more time they have had to interact with each other, which is captured by the minimum of the duration of residence in the village of both nodes. In a second step, for each individual we sum the predicted links at the hamlet level, which creates a predicted network size. This does not only take care of the hamlet size, but also extends similarity and minimum residence from the dyadic level to the village level.

The control function approach uses the residual from the first-stage regression using this instrument as predictor. This residual captures the endogenous part of the observed network size, i.e., the variation in network size that is not predicted by the instrument. Including this residual in the second stage regression then deals with potential endogeneity.

Importantly, this approach is conditional on a set of controls. First, as both predicted and observed network size increase with the size of the hamlet, the residual of the control function does not capture the effect of hamlet size in the second stage. If household decision-making varies with hamlet size, it is important to add hamlet size as control in the second stage. Second, the same reasoning applies to the individual characteristics used in the dyadic regressions that could directly influence household

decision-making (age, education and duration of residence). Even though we only use dyadic measures to predict the ties, we cannot exclude the possibility that the predicted network size also correlates with the individual characteristics. If it does, the residual of the control function will not capture them, and it is important to add them as controls in the second stage. Further explanations, the dyadic regressions and the estimates of the first-stage control function can be found in Appendix A.

A final source of endogeneity is measurement error of the wives' networks. Incomplete sampling of networks could lead to an inaccurate measurement of network size, which in turn might bias the estimates of the effect of network size (Advani and Malde 2018). If the measurement error was random, we would have a classical problem of "attenuation bias" and the estimated effect of the number of friends would be underestimated. However, incomplete sampling of networks does not lead to random measurement error. It underestimates individual network degree, and the more so with lower sampling rates. In other words, instead of being random, measurement error would be negative and the more so with higher 'true' levels of network degree. This negative correlation reduces the bias in the estimated effect of network degree (Bound et al. 2001), and if strong enough might even change the sign of the bias, i.e., overestimate the effects. To address endogeneity bias caused by measurement error in the number of friends, we will include in all regressions a control for the sampling rate, which we expect to be negatively correlated with the measurement error.

4.2 Results

Table 2 presents the regression results. Panel A presents the effect of wives' network size on the decisions about children's health. In Column 1, we find that having 1–2 friends or 3+ friends instead of no friends (reference category) decreases the likelihood that this decision is made jointly. The effects are sizable: the probability of joint decisions decreases by around 15 and 22 percentage points, respectively. In Column 3, we observe that having 1–2 friends or 3+ friends instead of no friends increases the likelihood that the husband makes these decisions alone by around 11-13 percentage points. The results in Column 5 show that having 1–2 friends or 3+ friends instead of no friends slightly increases the likelihood that this decision is taken by the wife alone. In the three columns, a Wald test does not reject the null hypothesis that both coefficients are the same. In other words, an increase from zero friends to at least 1–2 friends changes household decision-making, but does not change it further if we move from 1–2 friends to 3+ friends. This is in line with the concavity of $F(n)$, as assumed in the theoretical model.

We observe that most results are robust to including the residual of the control function (Columns 2, 4 and 6). In addition, the coefficients of the residual of the control function in both equations (reported in the note under the table) are not statistically significant, which implies we cannot reject the null hypothesis that wives' network size is exogenous (Wooldridge 2015). Both observations provide support for the use of the results without the control function.

Panel B presents the results for the decisions about the wife's health. Here again, the coefficients of residual of the control function are not statistically significant in the

Table 2 Decision-making by number of friends

	JD		HD		WD	
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Children's health					
1–2 friends	−0.149***	−0.151***	0.113***	0.122***	0.037*	0.030
	(0.040)	(0.049)	(0.034)	(0.037)	(0.022)	(0.029)
3+ friends	−0.218***	−0.232*	0.132***	0.186	0.086*	0.046
	(0.050)	(0.131)	(0.051)	(0.133)	(0.049)	(0.075)
Control function	No	Yes	No	Yes	No	Yes
1–2 friends vs 3+ friends[a]	0.215	0.474	0.682	0.585	0.275	0.777
	Panel B: Wife's health					
1–2 friends	−0.173***	−0.213***	0.138***	0.165***	0.034	0.048
	(0.048)	(0.063)	(0.048)	(0.058)	(0.023)	(0.032)
3+ friends	−0.248***	−0.421***	0.238***	0.377***	0.009	0.044
	(0.060)	(0.135)	(0.053)	(0.137)	(0.042)	(0.098)
Control function	No	Yes	No	Yes	No	Yes
1–2 friends vs 3+ friends[a]	0.232	0.042**	0.039**	0.041**	0.547	0.963

Notes: Average marginal effects reported of a multinomial logit regression. The dependent variable is created using the responses of the wives. JD: both spouses participate, WD: only the wife decides, and HD: only the husband decides. Panel A: $N = 693$ and Panel B: $N = 695$. All models control for hamlet size and sampling rate, and the respondent's age, education, and years living in the hamlet. The results in columns 1, 3, and 5 are the result of the same multinomial logit regression as are the results from columns 2, 4, and 6. Standard errors reported in parentheses, estimated with bootstrapping (with 2000 repetitions) clustered at the hamlet level. The coefficients for the control function in Panel A are 0.037 (p = 0.800) for WD and −0.054 ($p = 0.685$) for HD, using base outcome JD. The coefficients for the control function in Panel B are −0.144 ($p = 0.435$) for WD and −0.162 ($p = 0.230$) for HD, using base outcome JD

***, **, and * indicate two-sided significance levels at 1, 5, and 10%, respectively. All friendship ties are AND-ties

[a]Two-sided p-value of a Wald test that compares both coefficients. The results of the control function are presented in Table A.2

two equations. We will therefore only report on the columns without control function. Column 1 shows that having 1–2 friends or 3+ friends instead of no friends decreases the probability that the wife makes this decision together with her spouse by around 17 and 25 percentage points, respectively. Both coefficients are not statistically different from each other, as indicated by the Wald test. In Column 3, we find that wives with friends are more likely to report that their husband makes this decision alone than wives without any friends. The Wald test is statistically significant, which indicates that the probability of HD increases further if we move from 1–2 friends to 3+ friends. We summarize these findings in a first result.

Result 1 *Wives with friends are less likely to make joint decisions. Decisions about children's health are then more likely taken by the husband alone or by the wife alone, and decisions about wives' health are more likely taken by the husband alone.*

4.3 Does the type of friends matter?

Next, we study whether the type of friends matters for the effect of the wives' number of friends. To do so, we differentiate friends by their gender and whether they are shared with the husband. Following our Hypothesis 2 presented in Sect. 2, we expect that the effect of the number of friends is stronger if friends are not shared with the husband and/or are female.

4.3.1 Common and unique friends

To test whether the effect of the number of friends depends on whether they are shared with the husband, we run the same regressions and distinguish between "common friends" and "unique friends." Table 3 presents the marginal probabilities.

Panel A reports the results for decisions about children's health. The coefficient of the residual of the control function is not statistically significant in the two equations, which implies that we cannot reject the null hypothesis of exogeneity of the network variables. As a result, we only report on the model without control function. In Column 1, we find that having 1 and 2+ unique friends decreases the probability of joint decisions by around 13 and 16 percentage points, respectively. Having 1+ common friends does not have a significant effect. In Column 3, we find that any number of unique friends increases the likelihood of the husband making child health decisions alone. In Column 5. the coefficient of "2+ unique friends" is positive and marginally significant. In Columns 1, 3, and 5, none of the Wald tests that compare the effects of having one unique friend, 2+ unique friends and 1+ common friend are statistically significant.

Panel B estimates the effects of the number of common and unique friends on the decisions about the wife's health. Again, the coefficient of the residual of the control function is not statistically significant in the two equations. In Column 1, we find that the coefficients for unique friends are statistically significant and negative. In Column 3, we find positive and significant results on all variables. For both Columns 1 and 3, none of the Wald tests are statistically significant. In Column 5, we find that wives with two or more unique friends are more likely to make the decisions alone. According to the Wald test, the coefficients for 2+ unique friends and 1+ common friend are statistically different. We summarize the new findings in a second result.

Result 2 *The effect of the number of friends on child health decisions does not depend on whether friends are shared with the husband. For decisions about woman's health, having 2+ unique friends has a stronger effect than having at least one common friend on the likelihood that decisions are taken by the wife alone.*

4.3.2 Male and female friends

To analyze whether the gender of the friends matters, we replace the number of friends in the regressions with the number of male and female friends. The marginal probabilities of the estimated regression are presented in Table 4.

Table 3 Decision-making by number of friends: common and unique friends

	JD		HD		WD	
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Children's health					
1 unique friend	−0.131***	−0.126***	0.091**	0.094**	0.039	0.032
	(0.042)	(0.045)	(0.042)	(0.039)	(0.030)	(0.030)
2+ unique friends	−0.157***	−0.140*	0.069*	0.084	0.088*	0.055
	(0.053)	(0.074)	(0.040)	(0.067)	(0.047)	(0.059)
1+ common friends	−0.088	−0.080	0.090	0.100	−0.002	−0.020
	(0.055)	(0.076)	(0.070)	(0.081)	(0.040)	(0.045)
Control function	No	Yes	No	Yes	No	Yes
1 unique friend vs 2+ unique friends[a]	0.659	0.844	0.679	0.893	0.375	0.689
1 unique friend vs 1+ common friends[a]	0.536	0.556	0.985	0.954	0.451	0.362
2+ unique friend vs 1+ common friends[a]	0.448	0.493	0.825	0.876	0.140	0.202
	Panel B: Wife's health					
1 unique friend	−0.193***	−0.209***	0.163***	0.162***	0.030	0.047
	(0.057)	(0.064)	(0.060)	(0.062)	(0.032)	(0.039)
2+ unique friends	−0.195***	−0.262***	0.117***	0.105	0.078**	0.157*
	(0.054)	(0.096)	(0.045)	(0.081)	(0.038)	(0.094)
1+ common friends	−0.055	−0.082	0.115**	0.118	−0.060	−0.036
	(0.056)	(0.088)	(0.058)	(0.082)	(0.052)	(0.064)
Control function	No	Yes	No	Yes	No	Yes
1 unique friend vs 2+ unique friends[a]	0.970	0.498	0.396	0.446	0.352	0.178
1 unique friend vs 1+ common friend[a]	0.132	0.187	0.605	0.648	0.158	0.208
2+ unique friends vs 1+ common friend[a]	0.110	0.029**	0.975	0.891	0.026**	0.006***

Notes: Average marginal effects reported of a multinomial logit regression. The dependent variable is created using the responses of the wives. JD: both spouses participate, WD: only the wife decides, and HD: only the husband decides. Panel A: $N = 693$ and Panel B: $N = 695$. All models control for hamlet size and sampling rate, and the respondent's age, education, and years living in the hamlet. The results in columns 1, 3, and 5 are the result of the same multinomial logit regression as are the results from columns 2, 4, and 6. Standard errors reported in parentheses, estimated with bootstrapping (with 2000 repetitions) clustered at the hamlet level. The coefficients for the control function in Panel A are 0.060 ($p = 0.628$) for WD and −0.015 ($p = 0.878$) for HD, using base outcome JD. The coefficients for the control function in Panel B are −0.169 ($p = 0.486$) for WD and −0.026 ($p = 0.812$) for HD, using base outcome JD

***, **, * indicate two-sided significance levels at 1, 5, and 10%, respectively. All friendship ties are AND-ties

[a]Two-sided p-value of a Wald test that compares both coefficients. The results of the control function are presented in Table A.2

Panel A presents the results for child health decisions. The coefficient of the residual of the control function is not statistically significant in the two equations. As a result, we only report on the columns without control function. We find that wives with at least one female friend are less likely to report making child health decisions jointly with their spouse (Column 1), and are more likely to report that their husband makes these decisions alone (Column 3). No effect is found on the likelihood that decisions are

Table 4 Decision-making by number of friends: male and female friends

	JD		HD		WD	
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Children's health					
1 female friend	−0.166***	−0.179***	0.122***	0.144***	0.044	0.035
	(0.060)	(0.062)	(0.043)	(0.052)	(0.045)	(0.043)
2+ female friends	−0.212***	−0.268**	0.133**	0.233**	0.078	0.035
	(0.068)	(0.116)	(0.055)	(0.110)	(0.068)	(0.088)
1 male friend	0.031	0.022	−0.052	−0.035	0.021	0.013
	(0.052)	(0.065)	(0.036)	(0.037)	(0.049)	(0.057)
2+ male friends	−0.028	−0.077	0.022	0.106	0.005	−0.029
	(0.074)	(0.119)	(0.062)	(0.106)	(0.064)	(0.072)
Control function	No	Yes	No	Yes	No	Yes
1 female friend vs 2+ female friends[a]	0.402	0.344	0.866	0.354	0.609	0.997
1 male friend vs 2+ male friends[a]	0.539	0.273	0.189	0.138	0.820	0.495
1 female friend vs 1 male friend[a]	0.041**	0.035**	0.002***	0.003***	0.781	0.780
2+ female friends vs 2+ male friends[a]	0.187	0.133	0.299	0.291	0.536	0.552
	Panel B: Wife's health					
1 female friend	−0.181***	−0.221***	0.136**	0.164***	0.045	0.057
	(0.046)	(0.063)	(0.060)	(0.063)	(0.032)	(0.039)
2+ female friends	−0.189***	−0.331**	0.136**	0.242**	0.053	0.089
	(0.060)	(0.143)	(0.062)	(0.107)	(0.060)	(0.095)
1 male friend	−0.034	−0.071	0.023	0.048	0.011	0.023
	(0.057)	(0.081)	(0.057)	(0.071)	(0.041)	(0.052)
2+ male friends	−0.049	−0.191	0.094**	0.208*	−0.045	−0.017
	(0.058)	(0.160)	(0.046)	(0.121)	(0.054)	(0.085)
Control function	No	Yes	No	Yes	No	Yes
1 female friend vs 2+ female friends[a]	0.895	0.312	0.994	0.427	0.891	0.672
1 male friend vs 2+ male friends[a]	0.804	0.258	0.262	0.087*	0.308	0.571
1 female friend vs 1 male friend[a]	0.064*	0.071*	0.213	0.207	0.521	0.551
2+ female friends vs 2+ male friends[a]	0.132	0.155	0.640	0.745	0.353	0.350

Notes: Average marginal effects reported of a multinomial logit regression. The dependent variable is created using the responses of the wives. *JD*, both spouses participate; *WD*, only the wife decides; and *HD*, only the husband decides. Panel A: $N = 693$ and Panel B: $N = 695$. All models control for hamlet size and sampling rate, and the respondent's age, education, and years living in the hamlet. The results in columns 1, 3, and 5 are the result of the same multinomial logit regression as are the results from columns 2, 4, and 6. Standard errors reported in parentheses, estimated with bootstrapping (with 2000 repetitions) clustered at the hamlet level. The coefficients for the control function in Panel A are 0.049 ($p = 0.820$) for WD and −0.172 ($p = 0.303$) for HD, using base outcome JD. The coefficients for the control function in Panel B are −0.181 ($p = 0.553$) for WD and −0.204 ($p = 0.272$) for HD, using base outcome JD

***, **, and * indicate two-sided significance levels at 1, 5, and 10%, respectively. All friendship ties are AND-ties

[a]Two-sided *p*-value of a Wald test that compares both coefficients. The results of the control function are presented in A.2

taken by the wife alone. The results of the Wald tests indicate that the coefficients of "1 female friend" and "2+ female friends" are not statistically different in Columns 1 and 3. However, the coefficients of "1 female friend" and "1 male friend" are statistically different in both Columns. This indicates that female friends drive the effect of the wives' number friends.

Panel B presents the results for the decisions about the wife's health. We find that wives with at least one female friend are less likely to make their own health decisions jointly with their spouse (Column 1). Wives with a least one female friend or two male friends are more likely to report that their husband makes these decisions alone (Column 3). No effects are found on the likelihood that wives take these decisions alone. The results of the Wald tests indicate that the coefficients of "1 female friend" and "1 male friend" are statistically different in Column 1. This indicates that female friends drive the effect of the wives' number friends on the likelihood of JD. We summarize these new findings in a third result.

Result 3 *The effects on the likelihood of JD and HD decisions about children's health are driven by female friends. The effect on the likelihood of joint decisions about the wife's health are stronger when friends are female.*

4.4 Extensions

In this section, we extend the analysis in the following ways. First, we critically assess whether the results depend on how we use the network data. Specifically, we consider an alternative definition of wives' friendship ties. Second, focusing on the dependent variable, we test whether we can replicate the results using the husband's reports, and whether it matters that the reports of both spouses concur. Third, we generate additional support for the backlash mechanism. We test whether it extends beyond the health domain, and look at intimate partner violence (IPV), which tends to be closely related with husbands' controlling behavior[6].

4.4.1 Definition of friendship ties

To define friendship ties, we assumed that a tie existed if both individuals acknowledged the other as a friend. These are so-called AND-ties. An alternative method is to assume a friendship tie exists if either individual acknowledges the other as a friend. If we use this OR definition, the social networks of the wives in our sample are much larger. With this definition, wives have on average 12.1 friends, of which 7.3 are shared with the husband and 5.0 are unique, and 6.0 are male and 6.1 are female.

Table B.2 presents the regression results using the number of OR-ties. Note that to estimate the control function we also used the OR-ties in the dyadic regressions (see Table B.1, and Fig. 2 in Appendix B for the distribution of the number of observed and predicted friends). Due to the larger spread of the number of OR-ties as compared

[6] Within our sample, 70 husbands reported that they had at least one other wife in addition to the wife included in our sample. The main results are robust to excluding these couples from the analyses (see Appendix B.6).

to AND-ties, we do not categorize the number of friends. We find that most of the results are robust to the use of OR-ties, in particular concerning the decisions about the wife's health: more friends result in wives reporting that they are less likely to make joint decisions about their health with their spouse and more likely to report that their husbands make these decisions alone. Tables B.3 and B.4 estimate the effects disaggregated by the type of friends, defined by their gender and whether they are shared with the husband. Again, we find that most results—in particular the results on the decisions about the wife's health—are robust.

When we defined friendship ties, we ignored that people could at the same time also be relatives. One might wonder whether relatives might also have an influence on wives' involvement in household decisions, and whether both types of social ties interact with one another. To look into this, we use relatives defined as blood relations. Using the AND-ties (i.e., we assume there is a relation if it is confirmed by both persons in a dyad), we find that about nine percent of the wives in our sample have at least one relative in their village with the maximum number of relatives being four (only one observation). This low percentage is not surprising, given that the Sukuma tribe to which most belong is patrilinear. The majority of these kinship ties (82 %) are not friends. To test whether they have a separate influence on wives' participation in household decisions, we run our main regression, distinguishing friends who are not relatives, relatives who are not friends, and relatives who are friends. Table B.5 in the Appendix presents the results. We do not detect any significant effect of wives' number of relatives on their involvement in household decisions. The effects are driven by friends who are not relatives.

4.4.2 Husband's reports

So far, we only used the wives' reports about household decision-making. As we interviewed both spouses of each couple in the sample, we also have the husband's reports, which we use in the following two ways. First, we test whether we can identify the same effects of the wife's social network on child health decisions as reported by the husband[7]. Table B.6 presents the regression results. We find that husbands of wives with 1–2 friends are less likely to report that they make the decisions about children's health alone. Husbands of wives with 3 or more friends are more likely to report that their wife makes child health decisions alone.

Second, it might matter whether both spouses agree on who is involved in household decisions. Several studies have looked into reporting differences between spouses (Ambler et al. 2021, 2022; Anderson et al. 2017; Annan et al. 2021; Bernard et al. 2020) and found substantial disagreement between spouses. Table 5 cross-tabulates the responses of both spouses in a couple. Only 40% of the couples agree on who makes decisions about children's health.

In a next step, we assess whether the effect of the wives' number of friends differs by spousal agreement. For this, we run our main regression on two sub-samples that differ on spousal agreement. Table B.7 in the Appendix reports the results. As we

[7] Note that we cannot do this analysis on the health decisions, as we asked decisions about decision-making about their own health only, not about the spouse's health.

Table 5 Decisions about children's health: within-couple distribution

	Wife's reports		
	Jointly	Husband alone	Wife alone
Husband's reports			
Jointly	31%	7%	6%
Husband alone	31%	7%	7%
Wife alone	8%	1%	2%

Notes: $N = 688$

cannot compare standard errors due to differences in sample size, we focus on the size of the coefficients. We observe that the effects with both samples are somewhat similar to the main results reported in Table 2. If anything, we observe that when spouses agree (Panel A) there tends to be a linear effect of the number of friends, whereas when spouses disagree (Panel B) it matters whether wives have at least one friend (no further increases are observed beyond the first category)[8].

4.4.3 Backlash: additional evidence

We interpreted the positive effect of network size on the likelihood that husbands take decisions alone about their wife's health, as evidence of backlash. To provide additional evidence for the backlash mechanism, we run the following analyses, presented in Appendix B.5.

First, we test whether such effect also occurs outside the health domain. For this, we look at decision-making in three domains: wives' mobility, children's schooling, and large household purchases. We use the same answer options as before. The regression results follow a similar pattern to our main analysis. We observe that wives with friends are more likely to report that their husband takes decisions about their mobility alone (see Table B.8), which is in line with the backlash hypothesis. The regression results with the decisions in the two other domains (see Tables B.9 and B.10) are somewhat weaker but go in the same direction as the decisions in the health domain.

Second, we argue that the negative effect of wives' connections on their involvement in household decisions is due to backlash from their husbands. The husbands of wives with larger networks want to exert more control on household decisions. Backlash of women's empowerment has been mostly documented in the literature on IPV. As IPV tends to be closely associated with husband's controlling behavior (Aizpurua et al. 2021) and sole-decision-making by the husband (Donald et al. 2021), we should see a similar influence of the number of friends on the likelihood of IPV[9]. Our survey includes questions about IPV experienced in the 6 months prior to the survey. Thirty-three percent of the wives in our sample reported that they experienced IPV. We define

[8] It is also interesting to analyze whether the husband's reports are influenced by the number of friends they have. Figure 3 in Appendix C presents correlations between the husband's network degree and their reports about household decisions, and Table C.1 presents regression results. In Panel B, we find that husbands with 3+ friends are less likely to have decisions about their health taken by their wife alone.

[9] Note that we only assume that they are closely associated, but do not make any assumption about the causality between controlling behavior and IPV. The decrease in decision-making power of wives may be a result of their experience of IPV, or the husband's controlling behavior may increase the likelihood of IPV.

IPV as a wife having experienced any of the following: her husband pushing, punching, dragging, forcing sex, threatening or humiliating her. Column 6 of Table B.11 shows that wives with 2+ female friends or at least one male friend are more likely to report experiencing IPV. Note that we use Column 6 instead of Column 5, as the residual of the control function is statistically significant. These results provide further evidence that wives with more friends face a higher risk of backlash[10].

5 Discussion and conclusion

This paper tests how the social connections of wives affect their involvement in household decisions about their own health and the health of their children. We hypothesize that the size of wives' friendship network decreases their involvement in household decisions. This is due to a reaction of the husband who takes control of the household decision if the wife, supported by her social network, becomes too active or vocal for the husband's liking. We also hypothesize that the effect of the wife's number of friends is stronger if the friends are female or are not shared with the husband.

Using data collected from the Mwanza region in Tanzania, we find that women with social connections are less likely to make their decisions about children's health and their own health jointly with their spouse and more likely to report that their husband makes them alone. This provides evidence in support of Hypothesis 1. Further support for the backlash mechanism is provided by a positive association between the wife's number of friends and the likelihood of IPV, which has been the common focus in the literature on backlash of women's empowerment (Bulte and Lensink 2019; Caridad Bueno and Henderson 2017; Schuler et al. 1996).

A distinction of the effects by the type of friends provides additional insights. We found that most effects are driven by female friends and friends who are not shared with the husband, which supports Hypothesis 2. Interestingly, we also found that having 2+ unique friends makes it more likely that women take decisions alone. This suggests that women might be able to avoid backlash, if they are able to form friendship relations that are not shared with the husband.

In summary, previous evidence has shown that women's groups can improve women's bargaining power. Our paper studied whether this relationship also holds with more informal social connections, such as friends within the same village, and when applied to women's involvement in household decisions. We found strong evidence of backlash and some scope for avoiding this through the formation of friendship ties that are not shared with the husband.

Three final notes are needed on the external validity of our results and the policy insights that they generate. First, while our study uses data from only one tribe, the Sukuma, it is the largest tribe in Tanzania. This tribe is patriarchal, as is most of Tanzanian society as well as other areas of East Africa. As we believe it is the patriarchal and inherent gender norms that lead to the backlash we observed, we expect our results to be useful for other patriarchal societies in the region.

[10] IPV is commonly underreported (on this see, e.g., Lépine et al. (2020)). To the extent that this increases the error term, it makes the estimated effect of network size in the regressions less precise, as it increases the standard errors.

Second, while our main finding indicates that friendship ties in the village decreases the likelihood that spouses take decision jointly, it is not clear when the wife or the husband takes the household decisions alone. Our results indicate it mostly excludes women from household decisions. However, friendship ties that are not shared with the husband can also slightly increase the likelihood that women take decisions without the husband. Further research to better understand the conditions that influence the likelihood of each of both outcomes is needed to develop policy that effectively avoids backlash.

Third, our analysis builds on the existing evidence on the benefits of women's groups and tests whether these benefits extend to friendship connections. This is relevant for policy because friendship connections within a village are a more accessible option for women than formal groups, as they require less mobility compared to women's groups that often transcend the village boundary. Furthermore, they are more malleable than kinship relations. Women living in patrilineal societies, like in our sample, move away from their home village and relatives and therefore need to build new friendship relations in their new village. This does not mean women groups cannot be formed within the same village. Actually, they might be very useful to stimulate the formation of friendship ties that are not shared with the husband, which our findings showed to be beneficial for the wife's involvement in decision-making. Such village-level women's groups can be created with the help of governmental or non-governmental projects.

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Declarations

Conflict of interest The authors declare no competing interests.

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