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ABSTRACT

Objective: This study examines how intergenerational coresidence modifies the association between women's education and their household decision-making power in China.

Background: Past research on how married women's education increases their decision-making power at home has focused primarily on nuclear families. This article extends prior research by examining how this association varies by household structure. It compares women living with their husbands with those living with both their husbands and parents-in-law.

Method: This article used data from the China Family Panel Studies in 2010 and 2014. It employed marginal structural models to address the concern that certain characteristics selecting women of less power into coresidence with their parents-in-law may be endogenous to women's education.

Results: In nuclear households, women with a higher level of education have a higher probability of having the final say on household decisions. In multigenerational households, however, where women live with their parents-in-law, a higher level of education of women is not associated with an increase in women's decision-making power.

Conclusion: Coresidence with husbands' parents may undermine the effect of women's education on their household decision-making power.

Key Words: coresidence, decision-making, education, gender, intergenerational relations, power.

Decision-making power at home is essential to women's empowerment (Malhotra & Schuler, 2005). Male dominance in family decision-making increases intimate partner violence (Coleman & Straus, 1986), depression (Mirowsky, 1985), and marital dissatisfaction (Pimentel, 2000). Each spouse's socioeconomic resources (Blood & Wolfe, 1960), gender attitudes (Blumberg & Coleman, 1989), and expertise in and share of household responsibilities (Raven, Centers, & Rodrigues, 1975; Zuo, 2008; Zuo & Bian, 2005) affect decision-making patterns. Women's education may enhance their power by increasing their socioeconomic resources (Xu & Lai, 2002), exposing them to more egalitarian gender attitudes (Shu, 2004), and enhancing their capabilities to make household decisions (Kabeer, 2005). However, most studies on women's education and decision-making power have focused on nuclear households and assumed that the division of power involves only the husband–wife dyad. Would higher education improve women's decision-making power in multigenerational households? How might coresidence with the older generation moderate the effect of women's education on their power? This article addresses this gap and examines how the relationship between women's education and their decision-making power varies by household structure. Multigenerational relations and households are increasingly important, as longer life expectancies and population aging expand opportunities for intergenerational interactions (Bengtson, 2001). Understanding the association between women's education and decision-making power in multigenerational households, therefore, has important implications for what aging societies mean for marital power equality.

China offers an interesting context for this study. The ideal family in Chinese tradition is a patriarchal and patrilocal extended household where multiple generations coreside along the male lineage (Chu, Xie, & Yu, 2011; Pimentel & Liu, 2004). The central virtue is filial piety, the

norm that children should respect and care for their elderly parents (Z. Zhang, Gu, & Luo, 2014). Sons and their wives assume primary responsibilities for elderly care, whereas daughters live with their husbands' families and care for their parents-in-law (Cong & Silverstein, 2008). The marital relationship between sons and their wives is secondary to the bond between sons and their parents in extended households (Zuo, 2009). Intergenerational coresidence remains prevalent and predominantly patrilocal in contemporary China; 67% of parents aged 65 and older lived with their adult children according to the 2005 China Inter-Census Survey (Zeng & Xie, 2014). Most parents coresident with their adult children live with their sons and daughters-in-law (Chu et al., 2011). Rapid population aging and underdeveloped social security systems reinforce the cultural tradition of intergenerational coresidence that serves the needs of adult children in child care and elderly parents in old-age support (F. Chen, 2005; Q. F. Zhang, 2004).

This study uses data from the China Family Panel Studies (CFPS) to examine how the association between women's education and decision-making power varies by household structure. It compares women living with their husbands with those living with husbands and parents-in-law. Decision-making patterns in households where women do not live with their husbands and where women live with their own parents are documented elsewhere (Pimentel & Liu, 2004; Zuo, 2008). How much women's education translates into power may be mitigated when they live with their parents-in-law. Having a husband's parents in the household not only increases potential candidates for decision-making power but also constitutes a form of resources for the husband. Power in patrilocal multigenerational families is guided by both gender and seniority (Zuo, 2009). Women may have little say in household decisions regardless of their education.

This study employs marginal structural models (MSM; VanderWeele, Vansteelandt, & Robins, 2010) to address two theoretical complexities. First, preexisting characteristics may select women with less power into coresidence with their parents-in-law. MSM uses fewer assumptions than other propensity score methods and conventional regressions to adjust for these characteristics (Austin, 2011). Second, some confounders of living arrangements may be endogenous to women's education. Including such confounders in conventional regressions may yield biased estimates of the interaction between education and coresidence (Rosenbaum, 1984). MSM allows testing for interaction effects in the presence of such confounders (VanderWeele et al., 2010).

THEORETICAL FRAMEWORK

Women's Education and Household Decision-Making

How is women's education related to their decision-making power? First, education increases women's resources, such as income, enhancing their bargaining power in family negotiations (Malhotra & Mather, 1997). Resource theory posits that each spouse's decision-making power varies with his or her resources (Blood & Wolfe, 1960). Each spouse provides the other with access to his or her resources to help satisfy the latter's needs in exchange for the latter's compliance. Both women's absolute level of resources and their level of resources relative to their husbands' may increase their power (Blumberg & Coleman, 1989). Education may increase resources in absolute and relative terms. In absolute terms, women with higher levels of education have higher income than those with lower levels of education (Heckman & Li, 2004). In relative terms, when compared with women with lower levels of education, women with higher levels of education are more likely to be more educated than their husbands. In

China, the proportion of women more educated than their husbands increases as women's education increases (Han, 2010).

Second, education exposes women to more egalitarian gender attitudes (Shu, 2004). Gender ideologies guide marital power processes (Blumberg & Coleman, 1989; Komter, 1989). Women with more egalitarian attitudes are more likely to assert themselves in family negotiations (Malhotra & Mather, 1997) and thus have more decision-making power (Shu, Zhu, & Zhang, 2013; Xu & Lai, 2002). Highly educated women also tend to marry highly educated men (Han, 2010), who are also more likely to hold egalitarian attitudes (Shu, 2004). Husbands with more egalitarian attitudes are more likely to share power with their wives (Shu et al., 2013).

Third, education enhances women's abilities to make informed household decisions (Kabeer, 2005). Resource theory assumes that spouses use personal resources to bargain for individual preferences in family decisions, but couples may value collective well-being (Zuo & Bian, 2005) and household utility maximization (Becker, 1981). The balance of power may thus be on the side of the spouse with more expertise in making decisions (Raven et al., 1975). Education increases women's knowledge. Furthermore, education increases the probability of women being more educated than their husbands (Han, 2010) and thus having more knowledge than their husbands. Education, however, may not increase women's power on mundane decisions. Chinese couples often pursue family well-being and practice power–responsibility congruence instead of resource-based power bargaining (Zuo, 2008; Zuo & Bian, 2005). Women gain expertise and acquire rights to make mundane and child-related decisions by doing housework and handling child care (Shu et al., 2013; Zuo & Bian, 2005). Women with high socioeconomic status may reduce their housework (Yu & Xie, 2012) and relinquish power on mundane decisions (Zuo & Bian, 2005).

Past research on women's education and decision-making in China is scarce (Matthews & Nee, 2000; Shu et al., 2013; Yang & Zheng, 2013; Zuo, 2008; Zuo & Bian, 2005). Most studies have examined small nonnational samples, except for Shu et al. (2013), who used a national urban sample in 2000, and Yang and Zheng (2013), who used a 2010 national sample. Both studies found that more than half of the married couples made decisions together, but husbands had more power over major economic decisions, whereas wives had more power over daily expenditures. Shu et al. (2013) found no association between urban women's education and their decision-making power. They found that women's egalitarian attitudes enhanced their power on economic decisions; doing housework and handling child care increased their power on mundane and child-related decisions. Yang and Zheng (2013) found that women's education and egalitarian attitudes enhanced their power. They found no association between women's housework and power. One possible explanation for the inconsistencies between these studies is that both tested multiple predictors of power by including education, gender attitudes, income, and housework in one regression. Such models require strong assumptions about how each of these variables is related to the outcome (VanderWeele et al., 2010). The effect of education may be mediated by income, gender attitudes, and housework.

This article focuses on the total effect of women's education on their decision-making power and how it varies by household structure. It hypothesizes that in nuclear households, women's education increases the probability of their having the final say on household decisions. Women's income, gender attitudes, and housework, as well as the difference between these characteristics and those of their husbands', may explain part of the association between women's education and decision-making power. Husbands' education and the difference between wives' and husbands' education may also explain the association between women's

education and power. Testing these mechanisms, however, is beyond the scope of this study. This study focuses on the role of women's absolute level of education rather than their level of education relative to their husbands'. The main purpose of this article is to understand how improving women's educational attainment may empower them at home rather than the implications of spousal choices for decision-making power. This study focuses on education rather than income and occupation because education is less prone to endogeneity. Women with less decision-making power at home may be more likely to give up their careers after marriage.

Intergenerational Coresidence and Household Decision-Making

Patrilocal coresidence may undermine the effect of women's education on their decision-making power for three main reasons. First, coresidence with husbands' parents may increase the number of potential candidates for decision-making power. In coresident households, the relevance of wives' resources and expertise gets evaluated by their husbands and parents-in-law (Malhotra & Mather, 1997; Szinovacz, 1987). Husbands' parents also bring their own resources, gender attitudes, and expertise to the decision-making process. Under the resource theory framework, the value of the wife's resources needs to outweigh the combined value of the resources of her husband and parents-in-law for her to have the final say on decisions in coresident households. Thus the same amount of resources may entail greater bargaining power in nuclear than in coresident families.

Second, the presence of the husband's parents in the household constitutes a form of resources for the husband. His parents may act as his allies in decision-making (W. T. Liu, Hutchison, & Hong, 1973; Szinovacz, 1987). In nuclear families, spouses are more directly interdependent and rely on each other for services and companionship (Whyte, 1978). In patrilocal coresident households, the conjugal bond is weaker and secondary to the husband's

bond with his parents (Zuo, 2009). The husband is obligated to maintain the intergenerational order in the household to secure his parents' old age benefits and preserve the male lineage (Zuo, 2009). Hence male dominance in patrilocal households may be in the interest of the husband and his parents. Women's education may thus have limited effect in family negotiations.

Finally, the traditional patriarchal family norms in China may not allow wives to bargain for power in the first place. Power in traditional patrilocal multigenerational households is guided by both gender and seniority (Zuo, 2009). The wife is typically at the bottom of the power hierarchy, whether the household head is the husband or his parent and whether she lives with one or both of her parents-in-law (Zuo, 2009). She is supposed to serve the needs of the entire household (F. Chen, 2004). Yu and Xie (2018) found that the motherhood wage penalty was larger in patrilocal than in nuclear households, probably because women in patrilocal households perform both child care and elderly care. Although women may coordinate housework and child care with their mothers-in-law in contemporary patrilocal households, the relative status of women and their mothers-in-law has not reversed (F. Chen, 2004). Thus women may have little say in household decisions regardless of their education if such generation-based patriarchy prevails.

In summary, this article hypothesizes that in nuclear households, women's education increases the probability of their having the final say on household decisions. However, in multigenerational households where women live with their parents-in-law, women's education does not increase their decision-making power. The association between women's education and decision-making power is more positive in nuclear than in patrilocal coresident households.

METHODS

Data

This study used 2010 and 2014 data from the CFPS. The CFPS is a nearly nationwide longitudinal biennial survey since 2010 in 25 provinces or their administrative equivalents, representative of 95% of the national population (Xie & Lu, 2015). It interviews all members of sampled households. It surveyed 14,960 households and their 42,590 members in 2010. The unit of analysis in this article is a married woman. This study drew data on her siblings and parents from her interview, data on her husband and his siblings and parents from his interview, and household data from the family questionnaire answered by the household member most familiar with the family structure. Decision-making outcomes were collected in 2014. Living arrangements were measured in the same wave to focus on the household structure within which decisions were made. How the effect of education varies by changes in household structure over time is beyond the scope of this study. Women with less decision-making power may be more likely to live with their parents-in-law. Factors identified by prior work as confounders of coresidence were measured in 2010, temporally before the cross-sectional measure of living arrangements in 2014, to model selection into coresidence with parents-in-law in 2014 (Sharkey & Elwert, 2011), except for wives' and husbands' gender attitudes collected only in 2014. This study cannot implement fixed effects models to address unobserved time-invariant confounders because decision-making outcomes were measured only in the 2014 CFPS.

The analytic sample was constructed in the following steps. First, it excluded women who did not respond or who were not living with their husbands. Of the 13,875 married women surveyed in 2010, 3,558 were not interviewed in 2014. Panel sampling weights were applied to adjust for sampling design and loss to follow-up (Xie & Lu, 2015). Of the women interviewed in

2014, 1,623 did not live with husbands in both waves; 44 were not married in 2014. A total of 1,227 women whose husbands were not interviewed lacked data on husbands' income, occupation, class, health, siblings, and attitudes. This study followed prior work's methods to handle missing partner data (Seaman, White, Copas, & Li, 2012; Young & Johnson, 2013). Women without husband responses were included in multiple imputation, but not in the analyses. The results were weighted by the inverse probability of partner response, estimated by a logistic regression of whether a woman had a husband response on all variables except for those variables observed only among women with partner responses (see online appendix for details). Partner response did not vary by women's age, living arrangements, Hukou, or their husbands' education, but decreased with their education among those with rural Hukou. After weighting, covariate distributions of women with partner responses are representative of those with and without partner responses (Seaman et al., 2012).

Second, women without living parents-in-law in 2014 were excluded so that each woman had a nonzero probability of living with in-laws in 2014; 23% of women from the first step had no data on whether their in-laws were alive in 2014. Multiple imputation included whether in-laws were alive in 2010 (8% missing) and 2016 (11% missing), their ages, and all other variables in the analyses (White, Royston, & Wood, 2011). Of the women from the first step, 42% (averaged across imputations) had no living in-laws in 2014. The results were substantively similar when the analyses excluded women without data on whether their in-laws were alive in 2014. Third, this study excluded 5% of women from previous steps living with their own parents in 2014 to focus on the contrast between nuclear families and patrilocal coresidence. Fourth, it excluded 4% of women from previous steps who were childless so that child-related decision-making applied to each woman. The results were similar when childless women were included.

Finally, women's ages were limited to 20 to 65 years in 2010. The minimum age of women of the highest education level, 2-year college or higher, was 20. The 99th percentile of ages of women from previous steps was 65. As discussed later, the results did not vary statistically significantly by age (results not shown).

This study conducted separate analyses by women's Hukou given drastic differences in education by Hukou, the household registration system institutionalizing rural–urban inequality in China (Wu & Zhang, 2010). The results were substantively similar for women with rural Hukou in rural and urban areas. Women with rural Hukou are henceforth addressed as rural and those with urban Hukou as urban. Multiple imputation by chained equations was applied to handle missing data. Most variables were missing for less than 5% of the sample (see online appendix for percent missing of each variable). The results were combined across 50 imputations using standard formulas (Rubin, 1987). The sample size of each imputed dataset varied because whether women had any living in-laws and whether they lived with their own parents were imputed. The mean sample size was 2,885 for rural women and 1,013 for urban women.

Outcome Variables

This study measured a woman's decision-making power by whether she had the final say on five household decisions, 0 = "not having the final say," 1 = "having the final say." Separate models were estimated for each decision. The final-say measure denotes a specific power dimension, that is, overt power outcomes (Xu & Lai, 2002). The analyses combined women whose husbands had the final say and whose other household members had the final say. The results were substantively similar when they were conditional on the married couple having the final say. The 2014 survey asked the family respondent "who has the final say" on each of the following decisions: (a) household expenditure; (b) savings, investment, and insurance; (c)

buying a house; (d) educating and disciplining the children; and (e) buying expensive goods (such as refrigerators, air conditioners, and furniture sets). The respondent was instructed to select one final decision-maker and did not have the option to choose that no single person had the final say or that household members had an equal say. As discussed later, this measure is limited in reflecting joint decision-making processes. Nevertheless, the results of this article using the final-say measure may shed light on how women's education and household structure are related to other measures of decision-making power. Women with a higher level of education may be more involved in the negotiation process than those with a lower level of education. Coresidence with husbands' parents may undermine the effect of women's education in the negotiations.

Decision-making outcomes were reported by the family respondents. The interviewer asked who the most appropriate person to answer family structure questions was and chose such a household member aged 18 and older as the family respondent. Among rural women, 41% of their outcomes were reported by themselves, 44% by their husbands, and 16% by others. Among urban women, 48% were reported by themselves, 41% by their husbands, and 11% by others. A wife's education and living arrangements may affect whether she was the family respondent and how she perceived her power. Sensitivity analyses suggest that the associations between women's education, living arrangements, and decision-making power were not mediated by who the family respondent was (results not shown). The final-say measure has good internal consistency in Chinese societies (Y. Chen & Yi, 2006). The association between education and decision-making power is similar across husbands' and wives' reports, although their reports of who has the final say slightly differ (Y. Chen & Yi, 2006; Chien & Yi, 2014). A total of 1% of rural women and 3% of urban women had missing values on at least one of the outcomes.

Missingness did not vary by women's and their husband's education or living arrangements. This study included the imputed outcomes because it involved multiple outcomes (Johnson & Young, 2011). The results remained the same when imputed outcomes were excluded.

Predictor Variables

The predictor variables were women's education and living arrangements. Women's living arrangements were measured by whether they lived with parents-in-law in 2014, 0 = "not living with parents-in-law," 1 = "living with parents-in-law." Women's education was measured as the highest level of education attained. For rural women, the education levels included less than elementary school, elementary school, and middle school or higher; less than elementary school was the reference category. Rural women who finished at least middle school were coded as one group because only 6.8% of rural women finished at least high school. For urban women, the education levels included less than high school, high school, and 2-year college or higher; less than high school was the reference category. Urban women without a high school education were coded as one group for more parsimonious models. There were no significant differences, substantively or statistically, between women who did not finish middle school and women who finished middle but not high school. Of the urban women, 8.5% did not finish elementary school and 10.3% did not finish middle school. This study did not formally compare the effect of education between rural and urban women given drastic distributional differences in their education. Unifying the coding scheme of education between rural and urban women may result in small categories with large standard errors or large categories that assume homogeneity among heterogeneous groups. Using a continuous measure such as years of schooling may impose a normality assumption on the conditional distribution of education given the covariates and a linearity assumption on the effect of education on decision-making.

Control Variables

This study accounted for a wide range of variables to address selection into women's education and living arrangements. Otherwise, the difference in the effects of education between nuclear and coresident families may not be due to the difference in household structure, but rather to some other factor that affects both the outcome and education or coresidence. This study assumes that there are no unmeasured confounders, similar to conventional regression-based approaches (Austin, 2011). Measurement details of all control variables are available in Tables A1 to A5 in the online appendix.

Confounders of education affect women's education and power. They included wife's age, birth region, ethnicity, parental education and occupation, number of siblings, whether she has a brother, and whether she is the first-born child. Her demographic, parental, and sibling characteristics shape her educational opportunities (Connelly & Zheng, 2003) and affect her power by gender-role socialization (Blumberg & Coleman, 1989; McHale, Crouter, & Whiteman, 2003). Her age is correlated with length of marriage, which increases her power (H. W. Liu, 1959; Wolf, 1985; Zuo, 2009). Her parents' socioeconomic status is a form of her resources, enhancing her power (Xu & Lai, 2002).

Confounders of living arrangements affect coresidence and decision-making. First, wives' and husbands' economic, parental, and personal resources affect coresidence (Chu et al., 2011; Z. Zhang et al., 2014) and decision-making (Blood & Wolfe, 1960; Katz & Peres, 1985; Xu & Lai, 2002). Economic resources included their respective education, occupation, income, social class, and homeownership and husbands' Hukou. Parental resources included their respective numbers of living parents, parents aged 75 and older, and parents' education and occupation. Personal resources included their self-rated health, interviewer-rated appearance, and

age difference. Second, wives' and husbands' gender attitudes affect coresidence (Chu et al., 2011) and decision-making (Shu et al., 2013). Attitudinal measures included four items on divisions of labor and five items on filial obligations (see Table A4 in the online appendix). Dowry and how the couple met reflect their gender attitudes and affect coresidence (Yasuda, Iwai, Yi, & Xie, 2011) and decision-making (Conklin, 1979). Their respective migrant status, birthplace, birth cohort, ethnicity, and sibling age–sex composition affect coresidence (Chu et al., 2011; Cong & Silverstein, 2010) and influence decision-making via gender-role socialization (Blumberg & Coleman, 1989; McHale et al., 2003; Yang & Zheng, 2013). Finally, household characteristics affect coresidence (Chu et al., 2011) and decision-making (Xu & Lai, 2002). They included household income, whether the household engaged in farm work or a family business, whether it was in an urban area, whether the woman lived with her children, whether she had a child younger than age 6, and whether she lived with a married child.

Figure 1 displays the causal pathways linking education, coresidence, and decision-making. As coresidence is endogenous to women's education, some confounders of coresidence, such as women's income, are endogenous to their education. These confounders are time-dependent confounders (VanderWeele et al., 2010). Confounders of coresidence thus consist of women's education, confounders of education (preeducation controls), and time-dependent confounders (posteducation precoresidence controls). Variables that affect decision-making but are affected by coresidence were excluded because they are mediators rather than confounders of coresidence. Examples of such covariates are the division of housework and child care between women and coresident parents-in-law, proximity to women's noncoresident parents and parents-in-law, and financial exchanges with noncoresident parents and parents-in-law.

Analytic Strategy

To examine how the association between women's education and decision-making power varies by household structure, this study employed MSM using inverse probability of treatment weighting (IPTW; Robins, Hernán, & Brumback, 2000; VanderWeele et al., 2010). MSM using IPTW are two-step models. First, propensity score models are constructed to model selection into treatments by regressing treatment status on confounders. Applying the inverse probability of treatment weights estimated from these models creates a synthetic sample in which confounders are independent of treatments. Second, MSM is estimated as a weighted regression of outcomes on treatments. MSM builds on propensity score methods, and the parameters of MSM are IPTW estimators (Robins et al., 2000). MSM offers several advantages over conventional regressions and other propensity score methods.

First, MSM using IPTW requires fewer assumptions. Compared to conventional regressions, IPTW does not require correct specification of the association between covariates and outcomes (Austin, 2011). Compared to propensity score matching or stratification, IPTW requires fewer distributional assumptions about the underlying data (Curtis, Hammill, Eisenstein, Kramer, & Anstrom, 2007). Compared to propensity score covariate adjustment, which regresses outcomes on treatments and propensity scores, IPTW regresses outcomes on treatments using the propensity score weighted sample. Therefore, unlike propensity score covariate adjustment, IPTW does not require correct specification of the association between propensity scores and outcomes (Austin, 2011).

Second, MSM allows adjustment for time-dependent confounders (VanderWeele et al., 2010). Some covariates confounding the association between coresidence and power are effects of education. Controlling for such confounders in a conventional regression may yield biased

estimates of the interaction between education and coresidence (Rosenbaum, 1984). It "controls away" part of the effect of education on power and induces an association between unobserved confounders and education (Sharkey & Elwert, 2011, p. 1951). MSM circumvents the issue by including time-dependent confounders in calculating the inverse probability of treatment weights of coresidence and excluding them in education weights. Weighting each subject by the product of the weights of coresidence and education produces a pseudo-population in which confounders of education are independent of education and confounders of coresidence are independent of coresidence. MSM uses the weighted data to fit a model of the marginal mean of the potential outcome on education, coresidence, and the education–coresidence interaction. It does not need to include any confounders, which are already adjusted for by weighting (Robins et al., 2000). It is saturated and not subject to misspecification (VanderWeele et al., 2010).

This study implemented MSM in several steps. First, propensity score models were estimated for education and coresidence, respectively. Second, inverse probability of treatment weights were derived from these models. Finally, main and interaction effects of education and coresidence were estimated from the MSM with these weights applied.

Propensity score models. Equation 1 expresses the propensity score model for education, a multinomial logistic regression of education (E) on preeducation covariates (X). j refers to an education level other than the reference level. $E = 0$ is when education is at the reference level. A multinomial logistic model is used instead of an ordered logit model because although education levels have an intrinsic order, the effect of covariates on education may not be proportional. Equation 2 expresses the propensity score model for coresidence, a logistic regression of coresidence (C) on education (E), preeducation covariates (X), and posteducation precoresidence covariates (V). $C = 1$ is when the wife lived with her parents-in-law.

$$\log \frac{P\,(E = j \mid X)}{P\,(E = 0 \mid X)} = \alpha_0 + \alpha_1 X, j > 0 \tag{1}$$

$$\text{logit}\,[P\,(C = 1 \mid E, X, V)] = \gamma_0 + \gamma_1 E + \gamma_2 X + \gamma_3 V \tag{2}$$

IPTW. IPTW is the inverse of the predicted probability of the subject receiving the observed treatment. Stabilized weights include the marginal probability of observed treatment in the numerator to improve efficiency (VanderWeele et al., 2010). Equation 3, where e denotes the observed education level, expresses stabilized education weights, the denominator of which was derived from Equation 1. Equation 4, where c denotes the observed coresidence type, expresses stabilized coresidence weights, the denominator of which was from Equation 2. Equation 5 expresses the final weights, the products of education weights, coresidence weights, and sampling weights (*SW*). *SW* is the product of panel sampling weights and the inverse probability of partner response to adjust for sampling design, loss to follow-up, and partner nonresponse. The product of weights of education and coresidence was truncated at the 1st and 99th percentiles before being multiplied by *SW* to improve precision (Cole & Hernán, 2008).

$$W^E = \frac{P\,(E = e)}{P\,(E = e \mid X)} \tag{3}$$

$$W^C = \frac{P\,(C = c \mid E = e)}{P\,(C = c \mid E = e, X, V)} \tag{4}$$

$$W = W^E \times W^C \times SW \tag{5}$$

MSM. As expressed in Equation 6, it is a linear model, regressing whether a woman had the final say on her education, coresidence, and the interaction between education and coresidence, weighted by the weights from Equation 5. Although the outcome is binary, a linear model yields more easily interpretable coefficients than a logistic one because the model is saturated. Coefficients in Equation 6 can be directly interpreted on the probability scale. $E[Y_{e'c'}]$

is the predicted probability of a woman having the final say if she had education level *e'* and coresidence type *c'*. β_0 equals $E[Y_{00}]$, the probability of a woman having the final say if she had the reference level education and no coresident parents-in-law. β_1 is the Average Treatment Effect (ATE) of education among women not living with in-laws. β_1 equals $E[Y_{j0}] - E[Y_{00}]$, the difference in the probability of a woman having the final say if she had education level *j* versus the reference level in nuclear households. β_2 equals $E[Y_{01}] - E[Y_{00}]$, the difference in the probability of a woman with reference level education having the final say if she lived with in-laws versus if she did not. β_3 equals $(E[Y_{j1}] - E[Y_{01}]) - (E[Y_{j0}] - E[Y_{00}])$, the difference in the ATE of education between women with coresident parents-in-law and those without. $\beta_1 + \beta_3$ equals $E[Y_{j1}] - E[Y_{01}]$, the ATE of education among women living with parents-in-law.

$$E[Y_{e'c'}] = \beta_0 + \beta_1 E + \beta_2 C + \beta_3 EC \quad (6)$$

Standard errors were estimated using standard bootstrapping procedures from 2,000 iterations. Each iteration bootstrapped the entire procedure delineated above.

RESULTS

Descriptive Results

Table 1 describes sample outcome distributions. Women were the least likely to have the final say on housing and the most likely to have the final say on child education. A total of 20% of rural women and 37% of urban women had the final say on housing, and 39% of rural women and 53% of urban women had the final say on child education. Urban women were more likely to have the final say on any of the decisions than rural women. More than 45% of urban women, compared to less than 30% of rural women, had the final say on household expenditure, savings, and expensive purchases. For about 7% of urban women and 11% of rural women, household members other than women and their husbands had the final say. Table 2 describes the

distributions of the predictors. Urban women were more educated than rural women. Of the rural women, 61% did not finish middle school; 54% of urban women finished at least middle school. Rural women were more likely to live with parents-in-law than urban women (35% vs. 29%). The coresidence rates were similar to those in prior work (Chu et al., 2011; Ma & Wen, 2016). Among rural women, coresidence rates did not differ statistically significantly by education, although middle school graduates had the highest coresidence rate (37%). Among urban women, high school graduates were less likely to live with parents-in-law than nongraduates (22% vs. 32%). Of the college-educated urban women, 29% lived with in-laws. College-educated women were no less likely to live with in-laws than less-educated women probably because their opportunity cost of child care was higher and coresidence may help satisfy their child care needs (Ma & Wen, 2016).

Propensity Score Models and Inverse Probability of Treatment Weights

Table 3 describes the sample distributions of the control variables statistically significant at the $p < .05$ level in the propensity score models among rural or urban women. Descriptive statistics of all control variables are in Tables A1 to A5 in the online appendix. The propensity score models have no causal interpretations. Their sole purpose is to construct the weights to achieve covariate balance (Sharkey & Elwert, 2011). The coefficients and standard errors of these models are not shown for brevity (available on request). The IPTW had means close to 1 and small standard deviations (see Table A6 in the online appendix), which met the necessary condition for correct propensity score model specification (Cole & Hernán, 2008). Absolute standardized differences quantify the balance of covariates among treatment groups. Any differences greater than 0.25 may suggest imbalance (Harder, Stuart, & Anthony, 2010). Before weighting, the largest differences between any two levels of women's education were in their

ages, birth regions, numbers of siblings, and parents' education and occupation. The largest differences between women in nuclear and coresident families were in their ages, their husbands having a brother, and homeownership. After weighting, the differences between any two levels of education were less than 0.25 in all confounders of education; the differences between women in nuclear and coresident households were less than 0.25 in all confounders of coresidence. Alternative weight estimation methods including generalized boosted models (Mccaffrey et al., 2013) and covariate balancing scores (Imai & Ratkovic, 2014) did not further improve balance.

MSM

Table 4 presents the MSM results. The education coefficient was the ATE of education on decision-making among women in nuclear households. The coefficient of the education–coresidence interaction was the difference in the ATE of education between women with coresident parents-in-law and those without. The sum of the coefficients of education and the education–coresidence interaction was the ATE of education among women with coresident parents-in-law, the standard errors of which are in Table A7 in the online appendix.

Women's education increased the probability of their having the final say on all decisions among rural women in nuclear households. The probability of rural women in nuclear families having the final say was at least nine percentage points higher if they finished elementary school and at least 11 percentage points higher if they finished middle school when compared with those who did not finish elementary school. Among urban women in nuclear households, education did not uniformly increase their power on all decisions. When compared with those who did not finish high school, urban women who finished high school were statistically significantly more likely to have the final say on savings and child education and marginally significantly more likely on expenditure and housing. The probability of the wife having the final

say on expensive purchases did not vary by her education. College-educated women were not statistically significantly different from women with less than a high school education in their power on any of the decisions.

The effect of education was less positive in multigenerational households than in nuclear households. The probability of women having the final say did not increase with their education when they lived with parents-in-law. The effect of a middle school education relative to less than an elementary school education was insignificant for all decisions among rural women with coresident in-laws. The effect of a middle school education was at least 17 percentage points smaller in coresident than in nuclear households for decisions on expenditure, savings, housing, and expensive purchases; it was marginally significantly smaller on child education. The probability of rural women in coresident households having the final say on housing and child education if they finished elementary school was smaller than if they did not. The effect of an elementary school education relative to less than an elementary school education was at least 21 percentage points smaller in coresident than in nuclear households for all decisions. Among urban women with coresident parents-in-law, the probability of their having the final say did not vary by their education on any of the decisions. The effect of a high school education relative to less than a high school education was at least 35 percentage points smaller in coresident than in nuclear households for decisions on expenditure, savings, and expensive purchases; it was marginally significantly smaller on housing and child education. The effect of a college education relative to less than a high school education did not differ between women with coresident parents-in-law and those without.

This study also estimated a conventional logistic regression of whether a woman had the final say on her education, coresidence, the education–coresidence interaction, and all control

variables (results not shown). The estimated coefficients of women's education, coresidence, and the education–coresidence interaction using this conventional method were similar in statistical significance to the MSM approach, that is, a logistic regression of whether a woman had the final say on her education, coresidence, and the education–coresidence interaction weighted by the weights from Equation 5. The estimates of conventional regressions, however, may be biased because these regressions may overcontrol confounders endogenous to women's education and result in a correlation between unobserved confounders and women's education (Sharkey & Elwert, 2011).

DISCUSSION

This study extends prior research on women's education and decision-making power by examining how the effect of education on power varies by household structure in China. In nuclear households, women's education increases the probability of their having the final say on household decisions. Coresidence with husbands' parents, however, undermines the effect of women's education on their decision-making power. The probability of the wife having the final say does not increase with her education when she lives with her husband's parents.

Education enhances women's decision-making power in nuclear households by increasing their resources, egalitarian attitudes, and decision-making abilities (Blood & Wolfe, 1960; Kabeer, 2005; Shu, 2004). Receiving some formal education increases rural women's power in nuclear households. Rural women with at least an elementary school education are more likely to have the final say than those without. Urban women with a high school education in nuclear households have more power than those without. The difference between urban women with a college education and those with less than a high school education is insignificant. The difference between college and high school graduates in nuclear families is also

insignificant. One explanation is the small urban sample size, which produces large standard errors and imprecise estimates. Another possibility is that highly educated women may relinquish power on family decisions to focus on their careers (Zuo & Bian, 2005). Housework hours also decrease with urban women's socioeconomic status (Yu & Xie, 2012). Women of lower socioeconomic status may gain expert knowledge by doing housework and acquire the power to make household decisions given their expertise (Shu et al., 2013; Zuo & Bian, 2005).

The positive effect of women's education on their decision-making power is undermined in patrilocal multigenerational households. The association between women's education and their decision-making power is nonpositive if they live with their parents-in-law in China. Power in patrilocal multigenerational households is guided by both gender and seniority (Zuo, 2009). The husband has an obligation to maintain the intergenerational order to secure his parents' old-age benefits and preserve the male lineage (Zuo, 2009). The wife is expected to serve the needs of her husband and parents-in-law (F. Chen, 2004). Women may have little say on household decisions regardless of their education when they live with parents-in-law.

Some limitations of this study call for future research. First, this study focused on the final-say measure of decision-making power. This power form is theoretically important because it reflects overt power outcomes (Xu & Lai, 2002). The same power outcome may result from various power processes. Women may have the final say because their husbands delegate to them power on mundane decisions (Safilios-Rothschild, 1970). The decision outcome may result from competitive bargaining or cooperative interactions (Szinovacz, 1987). It may serve personal interests of the one with the final say (Blood & Wolfe, 1960) or collective family interests (Zuo, 2008; Zuo & Bian, 2005). Decisions may be negotiated among family members, implying joint decisions (Zuo & Bian, 2005). Prior studies found that over half of Chinese couples made joint

decisions, though husbands had more influence over major economic decisions whereas wives had more control over daily expenditures (Shu et al., 2013; Yang & Zheng, 2013). Power may be reflected in the negotiation process, though those participating in the process may not have the final say (Safilios-Rothschild, 1970). Women's education may increase their involvement in the negotiations. Coresidence with husbands' parents may diminish the effect of women's education in the process. The results of this study using the final-say measure may shed light on how women's education and household structure are related to other measures of decision-making power.

Second, although this study uses marginal structural models to control for a wide range of confounders that may select women into coresidence and certain education levels, it assumes that there are no unobserved confounders. This study cannot implement fixed effects models to address unobserved time-invariant confounders because the outcomes were measured only in 2014. This study lacked direct controls on some factors that may confound the associations between women's education, coresidence, and decision-making power. Societal gender ideology and male domination in politics and the economy may affect women's education and gender-role socialization (Kabeer, 2005). These structural factors may limit the effect of women's education on their decision-making power (Blumberg & Coleman, 1989). Individual commitment to marriage and personality traits may affect the couple's preferences for living arrangements and decision-making (Blumberg & Coleman, 1989). Although this study controlled for wives' and husbands' parental occupation when they were 14 and whether their parents were aged 75 and older, it lacked direct controls on parents' health and employment status, which reflect parental resources that affect power.

Third, the associations between education, coresidence, and decision-making may vary during the life course (Zuo, 2009). Robustness checks were conducted on whether age was adequately controlled and whether the results varied by age. The absolute standardized differences in age among levels of education and coresidence were less than 0.25 after weighting, suggesting adequate balance on age (Harder et al., 2010). Intergenerational coresidence may respond to women's child-care needs when they were of childbearing ages (younger than age 45); it may respond to their in-laws' elderly care needs when they were older (F. Chen, 2005). This study tested whether the results varied by whether women were aged 45 and older following the approach by VanderWeele et al. (2010). The numerators of Equations 3 and 4 were modified to be conditional on whether women were aged 45 and older. The marginal structural model included three additional interactions, between whether women were aged 45 and older and education, between whether women were aged 45 and older and coresidence, and between whether women were aged 45 and older, education, and coresidence. None of the interactions was statistically significant. The interactions between age in years, education, and coresidence were also insignificant. The difference in the effect of women's education on their power between those in nuclear and coresident households did not vary significantly by age in this study.

This study suggests that research on decision-making power in marriage should consider the impact of the extended family. Coresidence between married children and elderly parents in the United States often involves frail or widowed parents (Keene & Batson, 2010). Although intergenerational coresidence is not as common in the United States as in China, marital relationships in the United States are embedded in extended family relationships (Helms, 2013). Most American parents live in proximity and maintain weekly contact with adult children

(Swartz, 2009). Intergenerational relations may influence marital relations regardless of coresidence. Caregiving for coresident parents and support for noncoresident parents both affect adult children's marital satisfaction in the United States (Bookwala, 2009; Polenick et al., 2017). Less is known on how intergenerational relationships affect marital power and the effect of education on power.

In conclusion, the association between women's education and their decision-making power at home varies by household structure in China. Women's education increases their decision-making power in nuclear households, but not in multigenerational households where women live with their parents-in-law. China is aging rapidly resulting in an unprecedented burden of elderly care (F. Chen & Liu, 2009). Multigenerational coresidence as a form of intergenerational support remains prevalent in China (Zeng & Xie, 2014). Coresidence with husbands' parents, however, may undermine the effect of women's education on their decision-making power in the household.

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Table 1 *Sample Percentages of the Outcome Variables by Wives'* Hukou

	Rural *Hukou* n = 2,885	Urban *Hukou* n = 1,013
Who has the final say on:	%	%
Allocation of household expenditure		
Wife	27.5	48.8
Husband	61.9	43.8
Other	10.6	7.4
Savings, investment, and insurance		
Wife	25.0	47.1
Husband	64.8	46.9
Other	10.2	6.0
Buying a house		
Wife	20.2	36.6
Husband	69.1	56.1
Other	10.7	7.3
Educating and disciplining the children		
Wife	38.8	52.8
Husband	50.6	40.5
Other	10.6	6.7
Buying expensive consumer goods, such as refrigerators, air-conditioners, and furniture sets		
Wife	29.8	45.5
Husband	59.6	47.3
Other	10.6	7.2

Note: Numbers were weighted by the product of individual panel sampling weight and inverse probability of partner response to adjust for loss to follow-up, sampling design, and partner non-response.

Table 2 *Sample Percentages of the Predictor Variables by Wives'* Hukou

	Rural *Hukou* n = 2,885		Urban *Hukou* n = 1,013	
Predictor variables	%	% Living with husband's parents	%	% Living with husband's parents
Wife's education				
Less than elementary school	31.9	31.8		
Elementary school	29.4	34.6		
Middle school [a]	38.7	36.9	54.0	32.1
High school			29.1	21.9
College and above			16.9	29.0
Wife lives with husband's parents	34.6		28.6	

Note: Numbers were weighted by the product of individual panel sampling weight and inverse probability of partner response to adjust for loss to follow-up, sampling design, and partner non-response. a. This category denotes middle school or higher for rural *Hukou* and middle school or less for urban *Hukou*.

Table 3 *Summary Statistics for Statistically Significant Predictors of Wives' Education and Living Arrangements by Wives'* Hukou

Variables	Rural n = 2,885	Urban n = 1,013
Statistically significant predictors of wife's education	Mean/%	Mean/%
Wife's age	41.2	44.3
Wife is ethnic minority	11.1	4.5
Wife's region of birth		
North	19.9	16.2
Northeast	9.0	26.4
East	23.6	18.6
South Central	22.7	27.1
Southwest	20.3	7.0
Northwest	4.5	4.7
Highest education of wife's parents		
Less than elementary school	49.8	29.2
Elementary school	29.9	31.9
Middle school	13.5	21.4
High school and above	6.8	17.5
Occupation of wife's parents when she was 14		
Management/professional	10.1	25.7
Administrative/service/business/other	4.7	16.9
Agriculture/unemployed	76.9	35.3
Manufacturing	8.3	22.1
Wife's number of siblings	3.3	2.9
Wife has a brother	86.9	80.5
Statistically significant predictors of wife's living arrangements		
Husband's Education		
Less than elementary school	15.7	13.6
Elementary school	28.2	
Middle school	41.9	35.2
High school	14.3	28.5
College		22.7
Husband's income in 2010 (yuan)	14,102.4	21,642.1
Highest education of husband's parents		
Less than elementary school	49.0	33.6
Elementary school	31.6	33.4
Middle school	13.0	16.5
High school and above	6.4	16.5
Husband's number of siblings	3.1	2.9
Husband has a brother	78.1	69.7
Husband is the first-born child	34.9	38.6
Either wife or husband is an owner of the house	69.0	69.7
Wife's self-rated health (1-5, 1 = *excellent*, 5 = *poor*)	1.8	1.7
Husband's self-rated health (1-5, 1 = *excellent*, 5 = *poor*)	1.6	1.6
Household engages in farm work	76.8	7.6
Household income in 2010 (yuan)	30,607.5	49,405.3
Number of wife's parents-in-law alive in 2014		
Both father-in-law and mother-in-law alive	48.4	43.2
Only father-in-law alive	13.5	16.6
Only mother-in-law alive	38.1	40.3
Husband's attitude on "A man should live with his parents after marriage" (1-5, 1 = *strongly disagree*, 5 = *strongly agree*)	3.6	2.9
Wife's attitude on "Women should give birth to at least one boy to continue the family lineage." (1-5, 1 = *strongly disagree*, 5 = *strongly agree*)	3.5	2.6

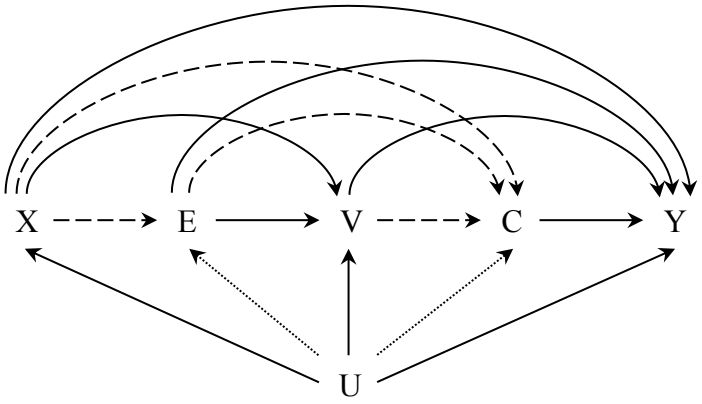
Note: Descriptive statistics of all control variables are in Table A1 to Table A5 in Appendix A. Numbers were weighted to adjust for loss to sampling design, follow-up, and partner non-response.

Table 4 *Summary of Marginal Structural Models of Wives' Education and Coresidence with Husbands' Parents Predicting Wives Having the Final Say on Household Decisions by Wives'* Hukou

Having the Final Say on	Household Expenditure	Savings, Investment	Buying a House	Child Education	Expensive Goods
Predictor	*B* *(SE B)*	*B* *(SE B)*	*B* *(SE B)*	*B* *(SE B)*	*B* *(SE B)*
Panel A: Women with rural *Hukou* (*n* = 2,885)					
Wife's education [a]					
Elementary school	0.12**	0.11*	0.09*	0.09*	0.09*
	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)
Middle school and above	0.14***	0.18***	0.11**	0.18***	0.17***
	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)
Wife lives with husband's parents	0.06	0.07	0.08	0.02	0.07
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Wife's education × wife lives with husband's parents					
Elementary school ×	−0.24**	−0.22**	−0.21**	−0.24**	−0.21**
living with husband's parents	(0.08)	(0.07)	(0.07)	(0.08)	(0.08)
Middle school and above ×	−0.17*	−0.21**	−0.17*	−0.15†	−0.19*
living with husband's parents	(0.08)	(0.08)	(0.08)	(0.09)	(0.08)
Constant	0.22***	0.18***	0.16***	0.34***	0.24***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Panel B: Women with urban *Hukou* (*n* = 1,013)					
Wife's education [b]					
High school	0.13†	0.17*	0.13†	0.16*	0.11
	(0.07)	(0.08)	(0.08)	(0.07)	(0.08)
College and above	0.03	0.08	0.04	0.01	−0.03
	(0.10)	(0.10)	(0.09)	(0.10)	(0.10)
Wife lives with husband's parents	−0.05	−0.04	−0.03	−0.08	−0.03
	(0.11)	(0.11)	(0.10)	(0.11)	(0.11)
Wife's education × wife living with husband's parents					
High school ×	−0.38*	−0.44**	−0.29†	−0.32†	−0.35*
living with husband's parents	(0.17)	(0.16)	(0.16)	(0.19)	(0.17)
College and above ×	−0.18	−0.10	−0.18	−0.02	0.00
living with husband's parents	(0.22)	(0.22)	(0.18)	(0.21)	(0.21)
Constant	0.51***	0.47***	0.38***	0.54***	0.49***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)

Note: a. Less than elementary school is the reference category. b. Less than high school is the reference category. †$p < .1$. *$p < .05$. **$p < .01$. ***$p < .001$. Standard errors were bootstrapped from 2,000 iterations. Although the outcome is binary, a linear model yields more easily interpretable coefficients than a logistic one because the model is saturated. All coefficients can thus be directly interpreted on the probability scale.

FIGURE 1. DIRECTED ACYCLIC GRAPH



Note: E is wives' education. C is coresidence with husbands' parents. Y is wives having the final say on decisions. X are confounders of wives' education. V are confounders of coresidence that are endogenous to wives' education. U are unobserved confounders. Arrows represent putative causal associations. Assuming no unmeasured confounding means assuming the dotted arrows are not present. Weighting the data with inverse probability of treatment weights removes the dashed arrows, i.e., the associations between education, coresidence, and confounders.