

Migration and the Gendered Origin of Migrant Networks Among Couples in Mexico*

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Objectives. We investigate how the matrilineal versus patrilineal origin of Mexican couples' migrant networks are associated with the aspirations to migrate and the subsequent migration behavior of each spouse. *Methods.* Using longitudinal data from the Mexican Family Life Survey (2002–2005) on 3,923 married couples across 139 municipalities, we estimate multilevel logistic regressions predicting aspirations to migrate to the United States for each spouse and the subsequent migration behavior of the couple in the interwave period. *Results.* The networks of both ego and spouse are associated with U.S. migration aspirations although they matter more for the person from which they originate. Only matrilineal networks predicted a subsequent move to the United States. for men and women/couples who were assessed jointly. *Conclusion.* Matrilineal networks are instrumental in the migration process, particularly of the couple. As such, they could prove instrumental in helping understand the migration motivations and dynamics of individuals and families.

Social networks, in particular family networks carrying migration experience, are essential facilitating mechanisms of international migration (Curran and Rivero-Fuentes, 2003; Fussell and Massey, 2004; Massey et al., 1994, 1999; Massey and Espinosa, 1997; Munshi, 2003; Riosmena, 2005; Massey and Riosmena, 2010). Although we have a good understanding of the type of assistance and information networks provide (e.g., Massey, 1990) and the limits to said mechanisms (e.g., Fussell and Massey, 2004), we know less about how different structural features of migrant networks pattern individual and family migration behavior. Specifically, the gendered origin of available migrant networks within a union, which is determined by their patrilineal and matrilineal¹ roots, remains largely unexplored.

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¹Patrilineal and matrilineal networks are defined by the side of the family from which a given network connection originates. Patrilineal networks are derived from the male line of a two-sex couple and, similarly, matrilineal networks originate with the female line.

Research has indeed shown that the gender composition of family networks is associated with distinct migration outcomes for men and women (Cerrutti and Massey, 2001; Curran and Rivero-Fuentes, 2003). Other work by Parrado and Flippen (2005) attributed some variation in power dynamics within couples in Mexico and within immigrant couples in the United States to females' access to a social network. Greater social contacts outside the household offered greater relationship control for couples in Mexico, but the opposite was true for Mexican immigrants in the United States. Early work by Hagan (1998), focused on the process of incorporation of Maya immigrants to the United States, also found that role of networks depends on the gender of the migrant. Broadly, weak ties in the United States facilitate the process of legalization for men, but not for women. Although largely focused on the role of social networks in the process of incorporation rather than on the decision to migrate, the implication of previous work is that social networks lead to distinct outcomes depending on the gender of who is accessing them (Parrado and Flippen, 2005; Hagan, 1998) and the gender composition of the networks themselves (Cerrutti and Massey, 2001; Curran and Rivero-Fuentes, 2003).

However, to date, most family network measures used in the literature aimed to understand the role of networks on emigration are attached to household heads and, as such, are limited to (his) line. Because it is men who are generally declared as household heads in surveys in the Mexican setting (both due to survey requirements and interviewer expectations), to an extent research has offered a gendered but patrifocal view. This omission is particularly relevant when considering the migration behavior of couples, which include two members, both embedded in family networks that precede the formation of the union. As such, each member of a given union potentially carries migration-specific social capital that they and, potentially, their spouses/partners could access. The inclusion of female-origin social capital specific to the network offers a more accurate measurement of variation in available social capital and the possibility of more accurate predictive modeling of migration behavior once couples have formed. This moves beyond models that speak more directly to male-centered labor migration, allowing the family to more clearly enter the discussion. Succinctly put, in the absence of a clear accounting of female-side migrant networks, a fundamental aspect of gender, family dynamics, and migration within a union is thus lost.

We use longitudinal data from the Mexican Family Life Survey (MxFLS) to construct distinct measures of migrant networks for male (husbands) and female (wives) members of a given heterosexual couple from self-reported links with residents in the United States, measured at the first survey wave in 2002 (MxFLS-1). This focus on couples is distinct from related work on the gender composition of networks (Curran and Rivero-Fuentes, 2003), which only considered single individuals. Other work on the gendered sequencing of migration (Cerrutti and Massey, 2001), which considered singles and couples jointly, only measured networks of the (generally male) household head rather than both members of a given union. First, we consider the association between

these networks and the U.S. migration aspirations of each spouse. We then assess the role of these migrant networks in the interwave (2002–2005) U.S. migration behavior of couples looking at two distinct outcomes: (1) male-only migration and (2) female-only/couple (joint) migration. This provides unique insight into migration behavior, delineating the independent contribution of male and female members of a couple to the formation of migrant networks and the role of these networks in aspirations to international migration and subsequent migration behavior.

Previous Studies

The General Role of Networks in Migration Aspirations and Behavior

A large body of research has confirmed the relevance of international migrant networks, considered a proxy for various forms of migration-specific social capital, in facilitating emigration. Migrant networks may be defined at distinct, overlapping levels of analysis—the community, the family/household/couple, and the individual. For instance, the likelihood of Mexico-U.S. migration increases (nonlinearly) with an increasing prevalence of U.S. migrants in one's community of origin (Fussell and Massey, 2004; Massey et al., 1994, 1999; Massey and Espinosa, 1997), even after explicitly dealing with the potential endogeneity of migrant networks (Munshi, 2003). The general idea is that individuals embedded in migrant networks at the community level are privileged to a greater variety of information about potential destinations, characterizing “weak” ties from the perspective of social capital theory (Granovetter, 1983). The process by which community-level migrant networks are formed has been posited to explain why U.S. migration is higher in some sending communities than in nearby ones with similar wages, employment, and economic activity (e.g., Galetto, 2009).²

In addition to the friendship and *paisanaje* networks embedded in these community-level measures, familial ties to U.S. migrants also increase the likelihood of migration even after controlling for observed (Massey and Espinosa, 1997) and unobserved (Palloni et al., 2001) characteristics. Studies have generally defined family- and household-level migrant networks by the migration experience of co-resident members of a given household or by the first-degree relatives (parents, siblings) of the household head. Though this experience is by and large measured by recording if a person has ever

²In the Mexican context, this is in part historically determined, originating in labor recruitment efforts, which pioneered some of the initial migrant networks and followed the railroad line from the Texas border to Guadalajara (McKenzie and Rapoport, 2006; Hanson and Woodruff, 2003; Massey, Durand, and Malone, 2002; Foerster, 1925). As such, the central-western part of the country dominated the flows for several decades. In the past three decades, however, other Mexican regions have incorporated into the process (Riosmena and Massey, 2012; Durand and Massey, 2003).

been to the United States (and the year in which this occurred), it can also be measured by length of stay in the United States, number of trips, and permanent residence/citizenship status (Riosmena, 2005). Findings generally support a strong and positive association between household migrant networks/experience/exposure and subsequent migration (Curran and Rivero-Fuentes, 2003; Kandel and Massey, 2002; Massey, 1990).

The joint predictive power of community and family migrant networks is rather high. For instance, differences in these community- and household-level networks help to explain intercountry differences in U.S. migration propensities across Latin American countries (Riosmena, 2005:Ch. 4). The availability of community- and family-wide migrant networks to an individual also generally are better predictors of emigration than changes in immigration policy (e.g., enforcement measures) and several macroeconomic indicators (Massey and Riosmena, 2010; Massey and Espinosa, 1997).

Despite this predictive power, what often remains unexplored is variation within households in the nature and strength of migrant networks, which requires information about the distinct networks of co-resident members. Although the act of migration can be thought of as an individual outcome that is part of a collective (familial, household-wide) risk-minimization strategy (Stark and Bloom, 1985), little research has incorporated the characteristics of individual networks into models of migration behavior, focusing instead on aggregates of these networks at the couple, household/family, and community level. Specifically, research has neglected understanding how networks embedded in the family of origin of the spouse (i.e., generally the wife in these surveys) have a different bearing on the orientation toward migration and the migration decision of other household members. This is not to say that individual-level networks should be the primary point of view, only that migrants are likely to incorporate available social capital from a variety of sources of which the spouse is one, which requires models that explicitly take this into account.

Gendered Migration Networks and Behavior

Theories of migration behavior such as neoclassical economics and—to a lesser extent—the new economics of labor migration (NELM) have traditionally neglected the role of spouses and other household members as active participants in the migration process. In the former, wage differences between places is the most important predictor of migration and the ultimate decision is, at best, concentrated in the hands of an altruistic (male) household head (for a more elaborate critique, see Evans, 1991). Although NELM does more explicitly consider the possibility that the migration of one or more household members could be achieved through cooperative bargaining in order to minimize risk for the household as a whole (Stark and Bloom, 1985), empirical applications akin to the theory seldom explicitly model how families negotiate

the move. Those that do, whether explicitly invoking NELM or not (Kanaiaupuni, 2000; Riosmena, 2009; Hondagneu-Sotelo, 1994; Galetto, 2009; Cerutti and Massey, 2001), mostly consider the role of spouses in explaining gendered patterns or the lifecycle timing of (mostly male) emigration, whereas we intend to consider the possibility that the origin of migrant networks (patrilineal vs. matrilineal) may be associated with distinct migratory outcomes or, at the very least, to consider the spouses' migration-specific social capital endowments in the process.

Although not focused on the gendered origin of the networks, some work has also been devoted to looking at the gender *composition* of household (patrilineal) networks. Using Mexican Migration Project (MMP) data for unmarried children of the household head aged 17–25, Curran and Rivero-Fuentes (2003) found that, for moves to the United States, having male network links matter more for men than for women while having female network links are positively associated with female migration only. In fact, the odds of emigration were actually lower for men with females in their network. Although relevant in that men and women access network-specific social capital in distinct ways, the work of Curran and Rivero-Fuentes (2003) focuses on unmarried individuals within a limited age range, which is distinct and therefore only indirectly comparable to the couple-level network and migration analysis presented here.

Other work has also considered the role of family networks in gender-specific migration, finding that (mostly patrilineal) networks seem to be just as relevant for women as they are for men. Cerrutti and Massey (2001) found important distinctions in the sequencing of family migration between single and married men and women. While married men generally initially engaged in solo migration and thus became in some cases the pioneers of an eventual family move, married women generally emigrated following husbands as part of the latter process, though their participation in reunification north of the border is quite active (Hondagneu-Sotelo, 1994). While this does suggest that males are in a privileged bargaining position in terms of decisions to migrate, it does not necessarily suggest that patrilineal networks are the only relevant factor. Instead, matrilineal networks remain largely unobserved in all the aforementioned studies. As with the work of Curran and Rivero-Fuentes (2003), the population considered by Cerrutti and Massey (2001), which included both single and married individuals, is not directly comparable to the work presented here that focuses on the gendered origin of networks within unions. Focusing on couples is sensible given the lack of research on matrilineal networks and migration and as union formation occurs relatively early and is still almost universal in Mexico (Quilodrán, 2001).

Much of this dearth of knowledge on the gendered origins of migrant networks is attributable to data limitations. An important source of information about Mexico-U.S. migration behavior has been and continues to be the MMP. However, in all sampled households where the man is the head (i.e., the vast

majority of them), the networks of the wife or partner remain observed only on a limited basis.³ Understanding the source of migrant networks within a union provides insight into a potentially important source of migration-specific social capital that could play a role in spousal choice (Parrado, 2004; Choi and Mare, 2008). In addition, gendered determinants of migrant networks could determine relative roles in the migration decision-making process. Using a uniquely suited source of data, we intend to contribute to extant knowledge about migrant networks and migration by explicitly accounting for gendered origins of networks, focusing on orientations and behavior subsequent to union formation.

Research Goals

Our first goal pertains to individual orientations toward migration held by male and female marital partners. Work outside of Mexico has explored the role of migratory intentions in subsequent migration, suggesting that it is an important if not necessary first step in the migration decision-making process (De Jong, 2000; De Jong et al., 1985; Gardner et al., 1985). By studying emigration intentions—in addition to actual behavior—we aim to improve our understanding of the role of networks on migration in a relatively short term but also in potential emigration in the long run and of the attitudinal mechanisms through which migration behavior might operate.

To our knowledge, little work has studied emigration intentions in the Mexican context (for an exception, see Creighton, 2012) while no published work has directly assessed the role of network origins in the formation of migration aspirations within (or outside) of a union. In other words, within a union, does the gendered origin of migrant networks shape the aspirations of male and female members of a couple toward a future migration? We assess the degree to which a husband's or wife's orientation toward migration is associated with his/her own migrant network or with those of his/her spouse.

Our second goal pertains to understanding how patrilineal and matrilineal networks measured at the survey baseline are associated with the subsequent migration behavior of the couple. Although, as said, little research has distinguished matrilineal from patrilineal migrant networks, studies have compellingly demonstrated gender variation in migration behavior and the decision-making process and in the relevance of the availability and characteristics of the networks in explaining these trends. Research has suggested

³For instance, Mexican Migration Project network measures in which one can identify the *timing* of the migration of other relatives versus that of the person under study are restricted to members living in the household in addition to the children, parents, and siblings of the household head. In contrast, one can only know if in-laws of the head have been to the United States and if they still live there, but not the timing in which the first move occurred (see Tables D, G, and H in the MMP questionnaire (<http://mmp.opr.princeton.edu/databases/ethnosurvey-en.aspx>)).

that the decision to migrate is dominated by male actors with wives initially opposing the move of their husbands, sometimes joining them subsequently north of the border (Hondagneu-Sotelo, 1994; Cerutti and Massey, 2001). However, these studies are silent with respect to which network configurations may facilitate the reunification of couples. We extend this line of research by focusing on the gendered origin of active networks (i.e., ties with individuals who are in the United States) to assess the degree to which one's own network or the network of his/her spouse contributes to subsequent migration behavior during the survey follow-up period.

Data Source and Analytic Sample

To model the relationship between networks, aspirations to migrate, and subsequent migration behavior, we employ the MxFLS. The MxFLS, fielded in 2002 (MxFLS-1) and 2005 (MxFLS-2), is an ongoing longitudinal survey containing 8,440 households across 150 municipalities (Rubalcava and Teruel, 2006). MxFLS-1 recorded detailed information about contacts in the United States for all adult (15+), co-resident household members, providing a unique source of network information that allows us to distinguish patrilineal from matrilineal origins. For MxFLS-2, individuals who had moved within Mexico or to the United States were located and reinterviewed. Of those sampled in MxFLS-1, including individuals that had left their household of origin, over 90 percent were reinterviewed (Rubalcava et al., 2008). We limited our sample to co-resident, heterosexual couples, who, by definition, have the potential for having both matrilineal and patrilineal networks. The resulting sample, shown in Table 1, consists of 3,923 couples⁴ across 139 municipalities.⁵

Measures

Aspirations to Migration

We constructed our measure of an individual's aspiration to migrate from two questions⁶ querying whether a respondent is considering a move in the future and the general intended destination. The second question allows us to identify those who aspired to international migration to the United States. We coded those who harbored no aspirations to migrate or aspired to domestic migration as a single reference group. Of males who aspire to migrate to the

⁴Couples were identified using the household roster in MxFLS-1, which matches all adults to their co-resident spouse/partner (cónyuge/pareja).

⁵Sampled households within 11 of the municipalities in which MxFLS-1 (2002) was carried out did not contain a married, co-resident couple and were excluded.

⁶Q1: *Have you thought about moving in the future, outside the locality/community where you currently live?*

Q2: *To where do you think you could move?*

TABLE 1

Descriptive Statistics for Models of Aspirations to Migrate by Sex

	Aspirations to Migrate			
	Male		Female	
	No Percentage or Mean (<i>SD</i>)	Yes Percentage or Mean (<i>SD</i>)	No Percentage or Mean (<i>SD</i>)	Yes Percentage or Mean (<i>SD</i>)
Patrilineal migrant network (percentage yes)	14.47	34.74	14.77	28.07
Matrilineal migrant network (percentage yes)	18.57	29.47	18.52	40.35
Ambiguous network (percentage yes)	19.80	24.21	19.76	29.82
Child/grandchild in the United States (percentage yes)	3.27	3.16	3.23	5.26
Urbanicity (percentage rural)	41.72	36.84	41.75	31.58
Log per capita household expenditure	6.84 (1.02)	7.19 (1.05)	6.84 (1.02)	7.32 (0.94)
Education (years)	7.72 (4.16)	8.03 (3.61)	7.10 (3.79)	8.47 (3.79)
Age (years)	36.06 (8.31)	33.71 (8.54)	33.25 (7.63)	31.25 (7.63)
<i>N</i>	3,828	95	3,866	57
<i>n</i> (combined)	3,923		3,923	

SOURCE: MxFLS-1.

United States, 35 percent have a patrilineal network (see operational definition below) compared to only 15 percent of those who do not aspire to migrate (Table 1). A similar pattern is observed for matrilineal networks and female aspirations to migrate: 19 percent of women who do not aspire to migrate have a matrilineal network where as 40 percent of those who do, have one.

Male-Only Versus Female-Only/Couple Migration

We consider two distinct migration outcomes—male-only and couple/female-only migration—which are used to construct a three-part categorical

measure with “no migration” as the reference. Although female-only migration within unions is of independent interest, we did not have sufficient cases ($n = 22$) to empirically assess it. Rather than excluding these cases, we considered female migration with and without the husband as a single analytic category given that female-only moves within marriage might more often than not imply family reunification north of the border (Hondagneu-Sotelo, 1994; Cerutti and Massey, 2001). To test the sensitivity of our models, we ran identical models and excluded the female-only migrants. In terms of magnitude, sign, and direction, the results were nearly identical to those obtained using the single couple/female-only category. We ascertain the type of migration event experienced by the couple by using the place of residence in MxFLS-2. The exact date of the move is not available, only that they are resident or resided in the United States at some point between MxLFS-1 and MxFLS-2. Interestingly, the percentage of male-only migrants who have a matrilineal network (34 percent) is more than twice that of those who have a patrilineal network (14 percent; see Table 2). These percentages are somewhat higher for female-only migration and couples moving together: 35 percent have a patrilineal network where as 54 percent have a matrilineal one. In contrast, these figures are 15 and 18 percent for couples who did not move between waves.

Matrilineal and Patrilineal Networks

Conceptually, distinguishing the gender origin of migrant networks is relatively straightforward. Links with individuals that precede the formation of a mixed-sex couple are considered matrilineal when they pertain to the female and patrilineal when they pertain to the male. That said, operationalizing this concept to get a robust measure of all available family-level migrant networks is somewhat more complicated, requiring detailed information about the nature of each network relation to each member of the couple. Although MxFLS queries each adult about his or her contacts in the United States, there are certain relationships that cannot clearly be categorized as matrilineal, patrilineal, or ambiguous. Figure 1 depicts the classification scheme we employ, showing the relationships we consider clearly defined as either patrilineal or matrilineal and those that we consider ambiguous or to have been formed after the union was formed. As before, patrilineal networks are derived from the male line of a two-sex couple and, similarly, matrilineal networks originate with the female line.

To give a more complete picture of the correlation between matrilineal and patrilineal networks, Table 3 reports the distribution of networks within couples. Overall, 72 percent of couples do not have a network of any type. Of those couples with networks, 33 and 47 percent have only a patrilineal and only a matrilineal network, respectively, whereas 19 percent of couples have both network types. This last figure shows that the amount of overlap

TABLE 2
Descriptive Statistics for Models of Migration Behavior

	No Migration Percentage or Mean (<i>SD</i>)	Male-Only Migration Percentage or Mean (<i>SD</i>)	Female-Only/ Couple Migration Percentage or Mean (<i>SD</i>)
Patrilineal migrant network (percentage yes)	14.74	14.75	34.88
Matrilineal migrant network (percentage yes)	17.96	33.61	53.49
Ambiguous network (percentage yes)	19.98	15.57	25.58
Child/grandchild in the United States (percentage yes)	3.03	7.38	11.63
Male aspiratons to migrate (percentage yes)	2.29	3.28	11.63
Female aspiratons to migrate (percentage yes)	1.38	1.64	6.98
Urbanicity (percentage rural)	40.82	66.39	39.53
Log per capita household expenditure	6.86 (1.02)	6.33 (1.05)	7.21 (0.99)
Education (years—men)	7.76 (4.16)	6.44 (3.93)	8.16 (2.77)
Age (years—men)	36.10 (8.29)	34.53 (8.11)	32.21 (9.93)
<i>N</i>	3,758	122	43
<i>n</i> (combined)	3,923		

SOURCE: MxFLS-1 and MxFLS-2.

in migrant networks is not too large. For instance, 29 percent of couples that have a matrilineal network also have a patrilineal tie, whereas 37 percent of couples with a patrilineal network also have a matrilineal tie.

Ambiguous and Postunion Migrant Networks

As seen in Figure 1, some network members are not clearly attributable to the male or female line. MxFLS did not clearly distinguish the family of origin for grandparents, aunts, uncles, nieces, and nephews (in Mexico, these terms may be used by people to refer to the family of the spouse). In contrast, parents/siblings and in-laws/step-siblings were explicitly separated. Therefore, we consider the former to be ambiguous and we are unable to make

FIGURE 1
 Classification of Matrilineal, Patrilineal, Ambiguous, and Postunion Migrant Networks

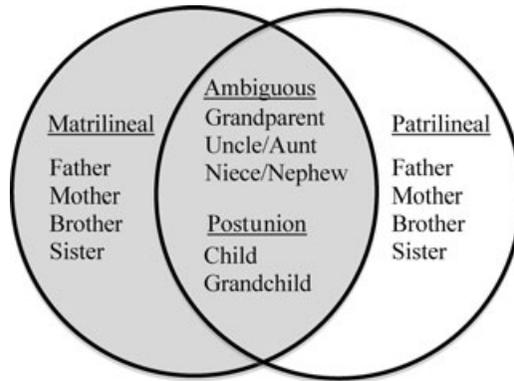


TABLE 3
 Distribution of Patrilineal and Matrilineal Networks

	Frequency	Percentage of Total	Percentage of Total (with Any Network)
Matrilineal network only	523	13	47
Patrilineal network only	371	9	33
Both	216	6	19
None	2,813	72	
Total	3923	100	100
Total (with any network)	1110		
Percentage of matrilineal networks with a patrilineal network			29
Percentage of patrilineal networks with a matrilineal network			37

SOURCE: MxFLS-1.

a patrilineal or matrilineal distinction. Children (sons and daughters) and grandchildren are often derived subsequent to couple formation and, in a sense, originate from the couple itself (and, as such, we refer to them as “postunion”), rendering patrilineal and matrilineal distinctions analytically inappropriate. We consider children and grandchildren to be a distinct characteristic of the migrant network and include their presence as an independent, dichotomous measure.

Household-Level Context, Municipal-Level Context, and Individual-Level Controls

In addition to the structure of migrant networks described above, we measured the household-level economic context and urbanicity of the municipality. Using detailed information about the household economy, we calculated the total household expenditure, divided the result by the number of co-resident members and took the natural logarithm. Log per capita expenditure is a useful measure of the household economic context, particularly in contexts where measures such as income fail to accurately describe individuals who are not receiving wages (Xu et al., 2009). We also measured the urbanicity of the location in which the household resides, considering communities with less than 2,500 residents to be rural, which is the definition used by the Mexican statistical office—INEGI. Two individual-level controls were included to account for age and education in years of the sampled individuals. When considering the migration outcome, which included female-only and couple migration, the education and age of the husband was used. In separate models we considered the age and education of the wife, but the estimates were consistent in terms of sign and significance so the male attributes were retained for the final tables.

Method

To model the link between migrant networks and subsequent migration, we explicitly account for the possibility that couples within a shared local environment may be correlated in terms of community-level migrant networks and a variety of socioeconomic attributes. In other words, they are more likely to be similar to each other than to couples in other municipalities. For our models of aspirations, our unit of analysis is the individual, considering separately male and female members of a union. For migration behavior, we consider couples, modeling male-only, female-only, and couple (joint) migration. In the data, there is a minimum of 1, a maximum of 168, and an average of 24 couples per municipality across 139 municipalities. We selected a multilevel random-intercept logistic model (Rabe-Hesketh and Skrondal, 2008) described by Equations (1) and (2).

$$\text{logit} \left\{ \Pr \left(\frac{y_{ik} = 1}{y_{ik} = 0} \middle| X, \mu_k \right) \right\} = \beta_0 + \beta_1 X + \mu_k \quad (1)$$

Equation (1) describes the multilevel random-intercept logistic model of migration networks and aspirations to migrate where the outcome, aspiring to migrate to the United States ($y_{ik} = 1$), is considered a function of individual

(*i*) and community (*k*) factors.

$$\text{logit} \left\{ \Pr \left(\frac{y_{ck} = 1, 2}{y_{ck} = 0} \middle| X, \mu_k \right) \right\} = \beta_0 + \beta_1 X + \mu_k \quad (2)$$

Equation (2) describes the multilevel random-intercept logistic model of migration networks and migration behavior where the outcome, experiencing male-only ($y_{ck} = 1$) or female-only/couple ($y_{ck} = 2$) migration, is considered a function of couple (*c*) and community (*k*) factors. Both Equations (1) and (2) include a random intercept varying over municipalities ($\mu_k \sim N(0, \sigma_k)$). The random component μ_k is assumed to be independent across clusters. We fit the model using the `glamm` command in Stata 11 (StataCorp, 2009).

Models

We estimated four nested models for both Equations (1) and (2), systematically introducing measures of patrilineal and matrilineal networks in addition to ambiguous networks and attributes of the household and municipality. Each model includes a control for ambiguous and postunion networks, log per capita expenditure, education, age, and urbanicity of the locality. The models of migrant behavior, described by Equation (2), include the measure of aspirations to migrate as independent variables. Model 1 introduces the measure of patrilineal networks. Model 2 is similar, but replaces the measure of patrilineal migrant networks with matrilineal migrant networks. Model 3 introduces both matrilineal and patrilineal migrant networks simultaneously.

Results

Aspirations to Migrate

Tables 4 and 5 report, for men and women separately, the estimated coefficient and standard errors from a multilevel logistic regression model of migrant networks and aspirations to migrate described by Equation (1). Model 1, which includes a measure of patrilineal migrant networks in addition to a number of controls (ambiguous network, child/grandchild in the United States, urbanicity, expenditure, education, and age), suggests that these networks are significantly and positively associated with aspiring to migrate to the United States for both men ($\beta = 1.120$; $p < 0.001$) and women ($\beta = 0.801$; $p < 0.01$). Model 2 is identical to model 1, but replaces patrilineal with matrilineal migrant networks. Similar to patrilineal networks in model 1, matrilineal networks are significantly and positively associated with aspiring to

TABLE 4

Two-Level Random-Intercept Regression Model Migrant Networks and Aspirations to Migrate—Men

	(1) β	(SE)	(2) β	(SE)	(3) β	(SE)
Patrilineal migrant network (1 = Yes)	1.120***	(4.90)			1.049***	(4.46)
Matrilineal migrant network (1 = Yes)			0.545*	(2.28)	0.323	(1.31)
Ambiguous network (1 = Yes)	0.145	(0.57)	0.121	(0.48)	0.156	(0.62)
Child/grandchild in the United States (1 = Yes)	0.278	(0.44)	0.288	(0.46)	0.285	(0.46)
Urbanicity (1 = Rural)	-0.178	(-0.71)	-0.136	(-0.54)	-0.182	(-0.73)
Log per capita household expenditure	0.344**	(3.21)	0.361***	(3.45)	0.335**	(3.13)
Education (years of schooling)	-0.024	(-0.81)	-0.030	(-1.01)	-0.023	(-0.79)
Age (years)	-0.040**	(-3.03)	-0.040**	(-3.04)	-0.040**	(-3.01)
<i>n</i> (individual)	3,923		3,923		3,923	
<i>n</i> (municipality)	139		139		139	
$\sigma^2_{municipality}$	0.303		0.329		0.270	
Log likelihood	-424.51		-432.63		-423.68	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

SOURCE: MxFLS-1 and MxFLS-2.

migrate for both males ($\beta = 1.106$; $p < 0.001$) and females ($\beta = 0.545$; $p < 0.05$).

Model 3 includes both patrilineal and matrilineal networks. For men ($\beta = 1.049$; $p < 0.001$), patrilineal networks explain the significant association between matrilineal networks and aspirations to migrate seen in model 2. Similarly, for women ($\beta = 0.994$; $p < 0.001$), matrilineal networks completely explain the significant association between patrilineal networks and aspirations to migrate observed in model 1. Though they show the expected positive sign, ambiguous networks are not significantly associated with an orientation toward migration to the United States for men or women. In sum, for both husbands and wives, one's own networks dominate, explaining the observed significant and positive association between one's spouse's network and aspirations to migrate to the United States.

TABLE 5

Two-Level Random-Intercept Regression Model Migrant Networks and Aspirations to Migrate—Women

	(1)		(2)		(3)	
	β	(SE)	β	(SE)	β	(SE)
Patrilineal migrant network (1 = Yes)	0.801**	(2.64)			0.559	(1.78)
Matrilineal migrant network (1 = Yes)			1.106***	(3.99)	0.994***	(3.48)
Ambiguous network (1 = Yes)	0.344	(1.14)	0.349	(1.16)	0.374	(1.24)
Child/grandchild in the United States (1 = Yes)	1.129	(1.77)	1.175	(1.84)	1.161	(1.81)
Urbanicity (1 = Rural)	-0.261	(-0.84)	-0.259	(-0.84)	-0.286	(-0.93)
Log per capita household expenditure	0.346**	(2.58)	0.351**	(2.62)	0.337*	(2.48)
Education (years of schooling)	0.041	(1.07)	0.043	(1.09)	0.047	(1.19)
Age (years)	-0.040*	(-2.28)	-0.042*	(-2.37)	-0.040*	(-2.30)
<i>n</i> (individual)	3,923		3,923		3,923	
<i>n</i> (municipality)	139		139		139	
$\sigma^2_{municipality}$	0.110		0.099		0.083	
Log likelihood	-283.44		-279.34		-277.87	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

SOURCE: MxFLS-1 and MxFLS-2.

The association between the additional controls and aspirations to migrate change little across models. Specifically, greater log per capita expenditure is positively associated with aspiring to migrate, suggesting that an orientation toward migration is not necessarily predicted by a smaller household budget. Age is negatively associated with aspirations to migrate, signifying that younger men and women are more likely to be oriented toward migration. Across models, having a child in the United States, urbanicity, and education are not significantly associated with aspirations to migrate.

Migration Behavior

Tables 6 and 7 report the estimated coefficient and standard errors from a single, multilevel logistic regression model of migrant networks and migration behavior described by Equation (2). The coefficient estimate for patrilineal

TABLE 6

Two-Level Random-Intercept Regression Model of Migrant Networks and Subsequent Migration

	(1)	(SE)	(2)	(SE)	(3)	(SE)
	β		β		β	
Male-only migration vs. no migration						
Patrilineal migrant network (1 = Yes)	-0.530	(-1.82)			-0.531	(-1.83)
Matrilineal migrant network (1 = Yes)			0.545*	(2.42)	0.597**	(2.62)
Ambiguous network (1 = Yes)	-0.227	(-0.83)	-0.170	(-0.63)	-0.206	(-0.76)
Child/grandchild in the United States (1 = Yes)	0.426	(1.02)	0.575	(1.39)	0.573	(1.38)
Male aspirations to migrate (1 = Yes)	0.409	(0.73)	0.334	(0.60)	0.421	(0.75)
Female aspirations to migrate (1 = Yes)	0.211	(0.27)	0.111	(0.14)	0.145	(0.19)
Urbanicity (1 = Rural)	0.788**	(2.78)	0.748**	(2.87)	0.775**	(2.92)
Log per capita household expenditure	-0.357**	(-3.19)	-0.389***	(-3.48)	-0.372***	(-3.31)
Education (years—men)	-0.011	(-0.37)	-0.012	(-0.41)	-0.013	(-0.44)
Age (years—men)	-0.030*	(-2.48)	-0.029*	(-2.40)	-0.030*	(-2.46)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

SOURCE: MxFLS-1 and MxFLS-2.

networks on male-only migration (Table 6) is, surprisingly, both not significant and negative, whereas it is positive but not significant for female-only/couple migration (Table 7). When the measure of matrilineal migrant networks is substituted for patrilineal migrant networks in model 2, it is significantly and positively associated with subsequent male-only ($\beta = 0.545$; $p < 0.05$) and female-only/couple migration ($\beta = 1.345$; $p < 0.001$).

These effects of matrilineal networks found in model 1 are robust to the inclusion of patrilineal networks. Model 3 simultaneously includes both patrilineal and matrilineal networks. For both male-only and female-only/couple migration, matrilineal migrant networks positively predict subsequent migration. Similar to model 1, the coefficient estimate for patrilineal migrant networks remains not significant. Of note, in a model that does not control

TABLE 7
Two-Level Random-Intercept Regression Model of Migrant Networks and
Subsequent Migration

	(1)	(SE)	(2)	(SE)	(3)	(SE)
	β		β		β	
Couple/female migration vs. no migration						
Patrilineal migrant network (1 = Yes)	0.589	(1.66)			0.389	(1.06)
Matrilineal migrant network (1 = Yes)			1.345***	(4.12)	1.244***	(3.71)
Ambiguous network (1 = Yes)	0.087	(0.23)	0.127	(0.34)	0.163	(0.43)
Child/grandchild in the United States (1 = Yes)	1.767**	(3.06)	1.958***	(3.41)	1.925***	(3.34)
Male aspirations to migrate (1 = Yes)	1.026	(1.82)	1.019	(1.81)	0.918	(1.60)
Female aspirations to migrate (1 = Yes)	0.900	(1.29)	0.881	(1.29)	0.851	(1.24)
Urbanicity (1 = Rural)	-0.205	(-0.51)	-0.165	(-0.43)	-0.218	(-0.56)
Log per capita household expenditure	0.302	(1.86)	0.304	(1.87)	0.291	(1.77)
Education (years—men)	0.012	(0.26)	0.009	(0.21)	0.014	(0.31)
Age (years—men)	-0.074***	(-3.56)	-0.072***	(-3.50)	-0.072***	(-3.44)
<i>n</i> (Individual)	3,923		3,923		3,923	
<i>n</i> (municipality)	139		139		139	
$\sigma^2_{municipality}$	1.087		0.739		0.804	
Log likelihood	-704.224		-697.893		-695.286	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

SOURCE: MxFLS-1 and MxFLS-2.

for aspirations (not shown but available from the authors), the coefficient for patrilineal networks is indeed significant ($p < 0.05$). However, as in the case of models controlling for migration aspirations, the coefficient loses significance once matrilineal networks are taken into account. In addition, when considering a binary outcome of any-male migration, patrilineal networks still do

not significantly predict migration once matrilineal networks are taken into account (also not shown but available from the authors).

Clear differences in terms of the type of migration (male-only vs. female-only/couple) are also observed for the non-network measures. Having a child in the United States predicts subsequent female-only/couple migration, which implies that a maternal tie is a significant factor in the decision to migrate. This suggests that for women, family unification is an engine of migration. Living in a rural context significantly predicts male-only migration but not female-only/couple migration, which suggests that married rural men are distinct in their willingness, ability, or need to migrate alone (Riosmena, 2005). Greater log per capita household expenditure is significantly associated with lower likelihood of male-only migration. Being older is negatively associated with migration behavior for both male-only and female-only/couple migration.

Undoubtedly, a number of variables associated with migration (both aspirations and behavior) were omitted. One candidate is municipal-level migration networks, which have been shown to have a positive association with migration (Massey and Espinosa, 1997), but were not directly measured in the model. The estimated variance at the community level ($\sigma^2_{municipality}$ in Tables 4–7), which is used to calculate the intraclass correlation coefficient (Rabe-Hesketh and Skrondal, 2008), offers some insight into where variation remains unexplained. Interpreted as a traditional correlation coefficient, the estimated intraclass correlation coefficient for model 3 for the models of migration behavior (Tables 6 and 7) is 0.20, suggesting that omitted characteristics play a somewhat modest role. For the models of aspirations (Tables 4 and 5) the estimated correlation is even smaller, never surpassing 0.10 in any model.

Conclusions

Our objective was to address two specific questions. The first related to whether the gendered origin of migrant networks shapes aspirations toward future migration. We conclude that matrilineal networks are associated with an orientation toward migration to the United States for married men and women. Similarly, when considered separately, patrilineal networks predict aspiring to migrate to the United States for both sexes. However, when the two sources of migrant networks are considered simultaneously, a clearer story emerges. For married women, their own networks (matrilineal) dominate. In other words, in the presence of active, origin-family networks in the United States, married women are significantly more likely to consider migration a future possibility regardless of their husband's networks. The same is true for men in that the presence of active, origin-family networks in the United States is significantly associated with aspiring to a future migration regardless of the spouse's networks.

The second question assessed if the gendered origin of migrant networks shaped subsequent migration behavior. Regardless of the type of migration—male-only versus female-only/couple—only matrilineal networks are significant predictors of subsequent migration behavior. We conclude that within a union, an individual's own networks may orient him or her toward migration, but only the matrilineal networks are strongly associated with migration behavior, especially for couple migration. That is not to say that male migrant networks do not matter as their role has been well documented in migration in general (Kanaiaupuni, 2000; Riosmena, 2005; Hondagneu-Sotelo, 1994; Galetto, 2009; Cerutti and Massey, 2001; Massey and Espinosa, 1997), only that for migration within a union, it is the wife's network that seems to make more of a difference.⁷ It is important to note that our focus on within-union migration excludes unmarried, male migrants. This is a nontrivial component of migration from Mexico and our results should be interpreted in a way that takes into account our focus on couples at a specific stage in the life course. Given that over a third of couples with a patrilineal network also have a matrilineal network in our data (see Table 3), the effects of patrilineal networks in other studies could also be proxies for at least some of the effects of matrilineal networks in the migration process.

The importance of matrilineal networks in the decision to migrate has not been documented in previous research and raises a number of additional questions about the migration decision-making process. Although work by Parrado and Flippen (2005) and Hagan (1998) has found that social networks lead to distinct outcomes for immigrant women and men in the United States, gendered variation in the origin and influence of networks prior to migration remains largely unexplored. We consider this work to be an initial step and we suggest that additional qualitative and quantitative research aiming to replicate and extend this work is required in order to understand how the structure and relevance of matri- and patrilineal networks influences the migration decisions of families. Additionally, research should also attempt to focus how the matri- or patrilineal origin of other, nonfamilial networks may also be associated with these decisions. In addition, future work should look directly at the link between matrilineal networks and changes in female migration patterns and intensity. This work, as most on the Mexico-U.S. migration stream, had too few female migrants to explore them as a separate analytic category, but a focus on domestic migration might offer a better opportunity to explore female-only migration and its determinants. That said, research on couples that includes a more holistic approach to understanding network-derived social capital (i.e., both partners' networks) clearly offers better predictive power and a clear sense of the important role of women in the process of migration.

⁷We are not aware of any study identifying whether the effect of the (patrilineal) networks varies by the marital status of the individual. It is also important to note that these effects were very similar when only looking at people living in central-western Mexico, the heartland of Mexico-U.S. migration and the region best represented by previous studies using MMP data.

REFERENCES

- Cerrutti, Marcela, and Douglas S. Massey. 2001. "On the Auspices of Female Migration from Mexico to the United States." *Demography* 38:187–200.
- Choi, K., and Robert D. Mare. 2008. "International Migration and Educational Assortative Mating in Mexico and the United States." *California Center for Population Research Working Paper Series* PWP-CCPR-2008-004.
- Creighton, Mathew J. 2012. "The Role of Aspirations in Domestic and International Migration." *Social Science Journal* Forthcoming.
- Curran, Sara R., and Estela Rivero-Fuentes. 2003. "Engendering Migrant Networks: The Case of Mexican Migration." *Demography* 40:289–307.
- De Jong, Gordon F. 2000. "Expectations, Gender, and Norms in Migration Decision-Making." *Population Studies* 54:307–19.
- De Jong, Gordon F., B. D. Root, R. W. Gardner, J. T. Fawcett, and R. G. Abad. 1985. "Migration Intentions and Behavior: Decision Making in a Rural Philippine Province." *Population & Environment* 8:41–62.
- Durand, Jorge, and Douglas S. Massey. 2003. *Clandestinos: Migración México-Estados Unidos en los Albores del Siglo XXI*. Zacatecas: Universidad Autónoma de Zacatecas.
- Evans, A. 1991. "Gender Issues in Rural Household Economics." *IDS Bulletin* 22:51–59.
- Foerster, Robert. 1925. *The Racial Problems Involved in Immigration from Latin America and the West Indies to the United States*. Washington, DC: United States Department of Labor.
- Fussell, Elizabeth, and Douglas S. Massey. 2004. "The Limits to Cumulative Causation: International Migration from Mexican Urban Areas." *Demography* 41:151–71.
- Galetto, M. V. 2009. "Three Essays on Migration and Local Development in Two Rural Communities of Western Mexico." Doctoral Dissertation, University of Wisconsin – Madison, WI.
- Gardner, R. W., G. F. De Jong, F. Arnold, and B. V. Cariño. 1985. "The Best-Laid Schemes: An Analysis of Discrepancies Between Migration Intentions and Behavior." *Population & Environment* 8:63–77.
- Granovetter, Mark. 1983. "The Strength of Weak Ties: A Network Theory Revisited." *Sociological Theory* 1:201–33.
- Hagan, Jacqueline M. 1998. "Social Networks, Gender, and Immigrant Incorporation: Resources and Constraints." *American Sociological Review* 63:55–67.
- Hanson, Gordon H., and Christopher Woodruff. 2003. "Emigration and Educational Attainment in Mexico." *University of California Working Paper*.
- Hondagneu-Sotelo, Pierrette. 1994. *Gendered Transitions: Mexican Experiences of Immigration*. Berkeley, CA: University of California Press.
- Kanaiaupuni, S. M. 2000. "Reframing the Migration Question: An Analysis of Men, Women, and Gender in Mexico." *Social Forces* 78:1311–47.
- Kandel, William, and Douglas S. Massey. 2002. "The Culture of Mexican Migration: A Theoretical and Empirical Analysis." *Social Forces* 80:981–1004.
- Massey, Douglas S. 1990. "Social Structure, Household Strategies, and the Cumulative Causation of Migration." *Population Index* 56:3–26.
- Massey, Douglas S., Joaquin Arango, Graeme Hugo, Ali Kouaouci, Adela Pellegrino, and J.

- Edward Taylor. 1994. "An Evaluation of International Migration Theory: The North American Case." *Population and Development Review* 20:699–751.
- Massey, Douglas S., Jorge Durand, and Nolan J. Malone. 2002. *Beyond Smoke and Mirrors: Mexican Migration in an Era of Economic Integration*. New York: Russell Sage Foundation.
- Massey, Douglas S., and Kristin E. Espinosa. 1997. "What's Driving Mexico-U.S. Migration? A Theoretical, Empirical, and Policy Analysis." *American Journal of Sociology* 102:939–99.
- Massey, Douglas S., Charles Hirschman, Philip Kasinitz, and Josh DeWind. 1999. *Why Does Immigration Occur? A Theoretical Synthesis*. New York: Russell Sage Foundation.
- Massey, Douglas S., and Fernando Riosmena. 2010. "Undocumented Migration from Latin America in an Era of Rising U.S. Enforcement." *Annals of the American Academy of Political and Social Science* 630:294–321.
- McKenzie, David, and Hillel Rapoport. 2006. *Can Migration Reduce Educational Attainments? Depressing Evidence from Mexico*. Palo Alto, CA: Stanford University, Stanford Center for International Development.
- Munshi, K. 2003. "Networks in the Modern Economy: Mexican Migrants in the US Labor Market." *Quarterly Journal of Economics* 118:549–99.
- Palloni, Alberto, Douglas S. Massey, Miguel Ceballos, Kristin Espinosa, and Michael Spittel. 2001. "Social Capital and International Migration: A Test Using Information on Family Networks." *American Journal of Sociology* 106:1262–98.
- Parrado, Emilio A. 2004. "International Migration and Men's Marriage in Western Mexico." *Journal of Comparative Family Studies* 35:51–71.
- Parrado, Emilio A., and Chenoa A. Flippen. 2005. "Migration and Gender Among Mexican Women." *American Sociological Review* 70:606–32.
- Quilodrán, J. 2001. "Un siglo de matrimonio en México." Centro de Estudios Demográficos Y de Desarrollo Urbano, Colegio de México, México, D.F.
- Rabe-Hesketh, Sophia, and Anders Skrondal. 2008. *Multilevel and Longitudinal Modeling Using Stata*. College Station, TX: Stata Press.
- Riosmena, Fernando. 2005. "Within, Between, and Beyond Space-Time: Three Essays on Latin America-United States Migratory Dynamics." Philadelphia, PA: Graduate Group in Demography, University of Pennsylvania.
- . 2009. "Socioeconomic Context and the Association Between Marriage and Mexico-U.S. Migration." *Social Science Research* 38:324–37.
- Riosmena, Fernando, and Douglas S. Massey. 2012. "Pathways to El Norte: Origins, Destinations, and Characteristics of Mexican Migrants to the United States." *International Migration Review* 46:3–36.
- Rubalcava, Luis, and Graciela Teruel. 2006. *User's Guide for the Mexican Family Life Survey First Wave*. Available at (<http://www.ennvih-mxfls.org>).
- Rubalcava, Luis, Graciela Teruel, Duncan Thomas, and Noreen Goldman. 2008. "The Healthy Migrant Effect: New Findings from the Mexican Family Life Survey." *American Journal of Public Health* 98:78–84.
- Stark, Oded, and David Bloom. 1985. "The New Economics of Labor Migration." *American Economic Review* 75:173–78.
- StataCorp. 2009. *Stata Statistical Software: Release 11*. College Station, TX: StataCorp LP.
- Xu, Ke, Frode Ravndal, David B. Evans, and Guy Carrin. 2009. "Assessing the Reliability of Household Expenditure Data: Results of the World Health Survey." *Health Policy* 91:297–305.

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