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*Gendered Networks and Mexican  
Migration.*

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***Abstract***

In this paper, we investigate how the gendered origin of migrant networks (i.e. matrilineal vs. patrilineal) is associated with aspirations to migrate and subsequent migration behavior. Using longitudinal data from the Mexican Family Life Survey (MxFLS), we follow 3,923 married couples across 139 municipalities over the 2002-2005 period. We find that the networks of both the individual and her/his spouse are associated with aspiring to migrate to the United States. However, one's own network matters most (i.e. matrilineal networks for women and patrilineal networks for men). On the other hand, in terms of behavior, only matrilineal networks predict a subsequent move to the U.S. for men and women/couples, who are assessed jointly. These findings suggest that our understanding of the role of migrant networks in perpetuating male-centered, labor migration does not necessarily translate once a union has formed. We make the case that future work would do well to account for not only the presence and composition of networks, but also their origin, which in certain circumstances may be the most relevant factor.

***Keywords:*** Migration, Networks, Mexico.

***Authors' biographical note***

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## **1. Introduction**

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; MASSEY and ESPINOSA, 1997; MASSEY and ZENTENO, 1999; MUNSHI, 2003; RIOSMENA, 2006; MASSEY and RIOSMENA, 2010). Although we have a good understanding of the type of assistance and information networks provide (e.g. FLORES, 2005; MASSEY, 1990b) and the limits to said mechanisms (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 which member of a given union is the origin of the ties, remains largely unexplored. Specifically, we consider two distinct network types, patrilineal and matrilineal, which are operationalized in the following way for this study. Patrilineal networks originate 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 (CURRAN et al. 2005; CERRUTTI and MASSEY, 2001). However, to date, most family network measures used in the literature are attached to household heads and, as such, are limited. Because it is men who are generally declared as household heads in surveys in the Mexican setting (both due to survey requirements and respondent and interviewer expectations) to an extent research has offered a gendered but patrilineal-only view. This omission is particularly relevant when considering the migration behavior of couples, which by definition include two actors, both of whom are embedded in family networks that precede the formation of the union. 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 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 U.S., measured at the first survey wave in 2002 (MxFLS-1). First we consider the association between these networks and being oriented toward a future migration (i.e. aspiring to migrate). We then observe these couples until the second wave in 2005 (MxFLS-2) to assess the role of these migrant networks in

two distinct migration 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, aspirations to migrate and subsequent movement.

## **2. 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-US migration increases (non-linearly) with an increasing prevalence of US migrants in one's community of origin (CURRAN and RIVERO-FUENTES, 2003; FUSSELL and MASSEY, 2004; MASSEY et al., 1994; MASSEY and ESPINOSA, 1997), even after explicitly dealing with the potential endogeneity of migrant networks (MASSEY and ZENTENO, 1999).

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 (MUNSHI, 2003). This information and social connection orients individuals toward a future move, defining a “culture of migration” (GRANOVETTER, 1983), where migrant networks lead to an orientation toward migration that shapes decisions in the context of origin prior to departure (KANDEL and MASSEY, 2002; KANDEL and KAO, 2001). There is a limit to this cumulative process as a point of network saturation can be reached where the flow of migrants tapers off early in some communities (CREIGHTON et al. 2009), especially in metropolitan areas (LINDSTROM and LÓPEZ-RAMÍREZ, 2010) and, in general, otherwise ceases to increase and even slows after a point of network saturation (FUSSELL and MASSEY, 2004; MASSEY, 1990a). At any rate, community-level migrant networks have been used to explain why migration tends to be concentrated in specific points of origin despite similarities in wages, employment, and economic activity with other, non-sending communities (e.g. GALETTO, 2009).<sup>1</sup>

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<sup>1</sup> In 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

In addition to the friendship and *paisanaje* networks embedded in these community-level measures, familial ties to US migrants also increase the likelihood of migration even after controlling for observed (DURAND et al., 2001) and also unobserved (MASSEY and ESPINOSA, 1997) characteristics. Studies have generally defined family- and household-level migrant networks by the migration experience of coresident 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 been to the US (and the year in which this occurred), it can also be measured by their length of stay in the U.S., their number of trips, and their permanent residence/citizen status (RIOSMENA, 2006). Findings generally support a strong and positive association between household migrant networks/experience/exposure and subsequent migration (PALLONI et al., 2001; CURRAN and RIVERO-FUENTES, 2003; KANDEL and MASSEY, 2002).

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 inter-country differences in US migration propensities across Latin American countries (MASSEY, 1990a). The availability of community- and family-wide migrant networks to an individual also generally are better predictors of emigration than immigration enforcement measures (RIOSMENA, 2006) and several macro-economic indicators (MASSEY and RIOSMENA, 2010). Despite this predictive power, what often remains unexplored is how variation within households in the nature and strength of migrant networks, which requires information about the distinct networks of coresident 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 (MASSEY and ESPINOSA, 1997; 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 different household

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(FUSSELL and MASSEY, 2004; MCKENZIE and RAPOPORT, 2006; MASSEY et al., 2002; HANSON and WOODRUFF, 2003). 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 (FOERSTER, 1925; MASSEY and RIOSMENA, 2010).

members. This is not to say that individual-level networks should be the primary point of view, only that migrant actors are likely to incorporate available social capital at a variety of levels, 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. 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 (MASSEY and RIOSMENA, 2010), empirical applications akin to the theory seldom explicitly model how families negotiate the move. Those that do, whether explicitly akin to the NELM or not (STARK and BLOOM, 1985; KANAIAUPUNI, 2000; RIOSMENA, 2009; HONDAGNEU-SOTELO, 1994; GALETTO, 2009), 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.

Although not focused on the gendered origin of the networks, some work has also been devoted to looking at the gender *composition* of household networks (by and large, on the patrilineal side).<sup>2</sup> Of particular note is work by Curran and Rivero-Fuentes (2003) who looked at how the gender composition of networks operate differently for male and female migration. Using Mexican Migration Project 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.

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<sup>2</sup> Also see Linvingston (2001) for how gendered networks might affect labor market outcomes of Mexican migrants in the US.

Other work considers the role of family networks in gender-specific migration, looking at differences in the determinants of migration for men and women. Cerrutti and Massey (2001) found important distinctions are in the sequencing of migration, generally finding they tend to follow a parent or a spouse as opposed to pioneering the eventual family move or engaging in independent solo migration of any other kind. While this does suggest that males are in a privileged bargaining position in terms of decisions to migrate, Cerrutti and Massey (2001) found little differences in the role of family networks in explaining these trends. For instance, women with a child in the U.S. were significantly more likely to migrate to the U.S. than similarly situated males, but the relationship was still positive and significant for men, suggesting that the household network effect was similar. Moreover, neither Cerrutti and Massey (2001) nor Curran et al. (2005) considered the patrilineal or matrilineal origins of family network, focusing instead on the attributes of network members or the gender of the potential migrants who share a common network.

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 Mexican Migration Project (MMP). However, in all sampled households where the man is the head (i.e. the vast majority of them), the networks of the spouse or partner remain observed only on a limited basis.<sup>3</sup> Understanding the source of migrant networks within a union provides insight into a potentially important source of social capital that could play a role in spousal choice. 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.

### 3. Research Questions

Our first question 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

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<sup>3</sup> For instance, Mexican Migration Project network measures in which one can identify the *timing* of the migration of other relatives vs. 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 US 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>).



subsequent migration, suggesting that it is an important if not necessary first step in the migration decision-making process (CERRUTTI and MASSEY, 2001; DE JONG,2000; DE JONG et al.,2006). 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 (1996)) 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 individuals toward a future migration? We will 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 question pertains to understanding how patrilineal and matrilineal networks shape 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 that the decision to migrate is dominated by male actors with married women participating to oppose the move of their husbands first, then to follow them (CREIGHTON 2009) or as tied movers to spouses and parents (HONDAGNEU-SOTELO, 1994). However, these findings are silent with respect to which networks configurations may facilitate the reunification of couples north of the border. 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) 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.

#### **4. Data And Sample**

To model the relationship between networks, aspirations to migrate and subsequent migration behavior, we employ the Mexican Family Life Survey (MxFLS). MxFLS, collected in 2002 (MxFLS-1) and 2005 (MxFLS-2), is an ongoing longitudinal survey containing 8,440

households across 150 municipalities (CERRUTTI and MASSEY, 2001). MxFLS-1 recorded detailed information about contacts in the U.S. for all adult (15+), co-resident household members, providing a unique source of network information, which 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 re-interviewed. Of those sampled in MxFLS-1, including individuals that had left their household of origin, over 90% were re-interviewed (RUBALCAVA and TERUEL, 2006). We limited our sample to co-resident, heterosexual couples, who, by definition, have the potential for both matrilineal and patrilineal networks. The resulting sample, shown in Table 1, consists of 3,923 two-sex couples<sup>4</sup> across 139 municipalities<sup>5</sup>.

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

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

Table 1: Descriptive Statistics of for Models of Aspirations to Migrate by Sex

	Aspirations to Migrate			
	Male		Female	
	No % or Mean (SD)	Yes % or Mean (SD)	No % or Mean (SD)	Yes % or Mean (SD)
<b>Patrilineal Migrant Network</b>				
No	85.53%	65.26%	85.23%	71.93%
Yes	14.47%	34.74%	14.77%	28.07%
<b>Matrilineal Migrant Network</b>				
No	81.43%	70.53%	81.48%	59.65%
Yes	18.57%	29.47%	18.52%	40.35%
<b>Shared Network</b>				
No	80.20%	75.79%	80.24%	70.18%
Yes	19.80%	24.21%	19.76%	29.82%
<b>Child in the U.S.</b>				
No	96.73%	96.84%	96.77%	94.74%
Yes	3.27%	3.16%	3.23%	5.26%
<b>Urbanicity</b>				
Non-Rural	58.28%	63.16%	58.25%	68.42%
Rural	41.72%	36.84%	41.75%	31.58%
<b>Log per Capita HH Expenditure</b>				
	6.84 (1.02)	7.19 (1.05)	6.84 (1.02)	7.32 (0.94)
<b>Education (Years)</b>				
	7.72 (4.16)	8.03 (3.61)	7.10 (3.79)	8.47 (3.79)
<b>Age (Years)</b>				
	36.06 (8.31)	33.71 (8.54)	33.25 (7.63)	31.25 (7.63)
n	3,828	95	3,866	57
n (combined)	3,923		3,923	

Source: MxFLS-1 and MxFLS-2

Table 2: Descriptive Statistics of for Models of Migration Behavior

	No	Male-Only	Female-Only/Couple
	% or Mean (SD)	% or Mean (SD)	% or Mean (SD)
Patrilineal Migrant Network			
No	85.26%	85.25%	65.12%
Yes	14.74%	14.75%	34.88%
Matrilineal Migrant Network			
No	82.04%	66.39%	46.51%
Yes	17.96%	33.61%	53.49%
Shared Network			
No	80.02%	84.43%	74.42%
Yes	19.98%	15.57%	25.58%
Child in the U.S.			
No	96.97%	92.62%	88.37%
Yes	3.03%	7.38%	11.63%
Urbanicity			
Non-Rural	59.18%	33.61%	60.47%
Rural	40.82%	66.39%	39.53%
Aspirations to Migrate			
No	97.71%	96.72%	88.37%
Yes	2.29%	3.28%	11.63%
Log per Capita HH 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)
n	3,758	122	43
n (combined)		3,923	

Source: MxFLS-1 and MxFLS

## **5. Measures**

### *Aspirations to Migration*

We constructed our measure of an individual's aspiration to migrate from two questions<sup>6</sup> 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 U.S. We coded those who harbored no aspirations to migrate or aspired to domestic migration as a single reference group.

### *Male-Only vs. Female-Only/Couple Migration*

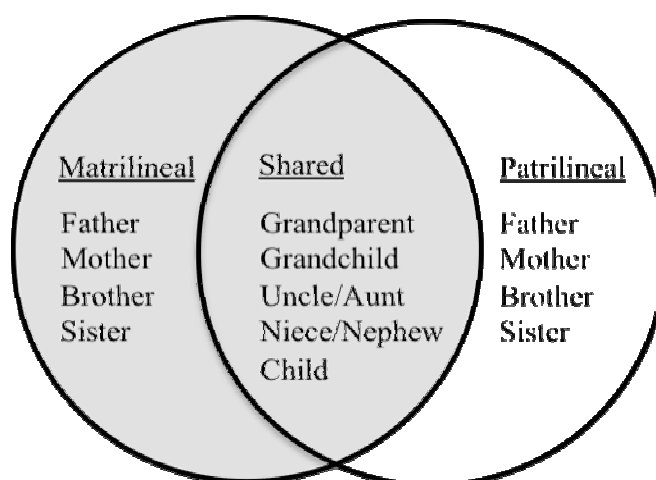
We consider two distinct migration outcomes –male-only, and couple/female-only migration, which are used to construct a three-part categorical measure with “no migration” as the reference. Although female-only migration within unions is of independent interest, we did not have sufficient cases (n=22) 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 generally imply family reunification north of the border (RUBALCAVA et al., 2008; HONDAGNEU-SOTELO, 1994). 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 U.S. at some point between MxLFS-1 and MxFLS-2.

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<sup>6</sup> Q1: *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?*

Figure 1: Classification of Matrilineal, Patrilineal and Shared Migrant Networks



### *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 their contacts in the U.S., there are certain relationships that cannot clearly be categorized as matrilineal, patrilineal or shared. 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 shared.

### *Shared, Post-Union Migrant Networks*

We consider two distinct measures of shared migrant networks, which are defined by the overlap of matrilineal and patrilineal networks in Figure 1. These shared networks are not clearly attributable to the male or female line either for conceptual reasons or due to ambiguity in the relationship of the network member. Children (sons and daughters) are often derived subsequent to couple formation and, in a sense, originate from the couple itself, rendering patrilineal and matrilineal distinctions analytically inappropriate. Therefore, we consider children to be a shared member of the migrant network and include their presence as an independent, dichotomous

measure. In addition, MxFLS did not clearly distinguish the family of origin for grandparents, aunts, uncles, nieces and nephews. In contrast, parents/siblings and in-laws/step-siblings were explicitly separated. Therefore, we consider the former to be shared and make no patrilineal or matrilineal distinction. It should be noted that our definition for all included categories of networks (matrilineal, patrilineal, shared and post-union) is limited to kinship networks. Potentially, other social relationships are of interest such as friends, neighbors. However, the available information prevents a broader network definition.

#### *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 coresident members and took the natural logarithm. Log per capita expenditure is a useful measure of the household economic context, particularly in contexts where measures like income fail to accurately describe individuals who are not receiving wages (CERRUTTI and MASSEY, 2001). 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 final tables.

## **6. 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 (XU et al., 2009) described by equation (1) and (2).

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

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.

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

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 equation 1 and equation 2 include a random intercept varying over municipalities ( $\mu_k \sim N(0, \sigma_k)$ ). The random component  $\mu_k$  is assumed to be independent across clusters. We fit the model using the `gllamm` command in Stata 11 (RABE-HESKETH and SKRONDAL, 2008).

## 7. Models

We estimated four nested models for both equation (1) and (2), systematically introducing measures of patrilineal and matrilineal networks in addition to shared networks and attributes of the household and municipality. Each model includes a control for having a child in the U.S., urbanicity, shared networks, log per capita expenditure, education and age. The models of migrant behavior, described by equation (2), include the measure of aspirations to migrate as an independent variable. 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.

Table 3: Two-Level Random-Intercept Regression Model Migrant Networks and Aspirations to Migrate - Men

	(1)		(2)		(3)	
	b	(se)	b	(se)	b	(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)
Shared Network (1=Yes)	0.145	(0.57)	0.121	(0.48)	0.156	(0.62)
Child in the U.S. (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 HH 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)
n (Individual)	3,923		3,923		3,923	
n (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

Table 4: Two-Level Random-Intercept Regression Model Migrant Networks and Aspirations to Migrate - Women

	(1)		(2)		(3)	
	b	(se)	b	(se)	b	(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)
Shared Network (1=Yes)	0.344	(1.14)	0.349	(1.16)	0.374	(1.24)
Child in the U.S. (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 HH 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)
n (Individual)	3,923		3,923		3,923	
n (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

## 8. Results

### *Aspirations to Migrate*

Table 3 and 4 report, for men and women separately, the estimated coefficient and test statistics from the multi-level 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 (child in the U.S., urbanicity, expenditure, education and age), suggests that these networks are significantly and positively associate with aspiring to migrate to the U.S. for both men (table 3) and women (table 4). Model 2 is identical to model 1, but replaces patrilineal with matrilineal migrant networks. Matrilineal networks are significantly and positively associated with aspiring to migrate for both male and females.

Model 3 includes both patrilineal and matrilineal networks. For men, patrilineal networks explain the significant association between matrilineal networks and aspirations to migrate seen in model 2. Similarly, for women, matrilineal networks

completely explain the significant association between patrilineal networks and aspirations to migrate observed in model 1. Though they show the “right” (i.e. positive) sign, shared networks are not significantly associated with an orientation toward migration to the U.S. for men or women. In sum, for both husbands and wives, the one’s own networks dominate, explaining the observed significant and positive association between one’s spouse’s network and aspirations to migrate to the U.S.

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 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 U.S., urbanicity and education are not significantly associated with aspirations to migrate.

Table 5a: Two-Level Random-Intercept Regression Model of Migrant Networks and Subsequent Migration

	(1)		(2)		(3)	
	b	(se)	b	(se)	b	(se)
<u>Male-Only Migration vs. No Migration:</u>						
Patrilineal Migrant Network (1=Yes)	-0.531	(-1.82)			-0.532	(-1.84)
Matrilineal Migrant Network (1=Yes)			0.546*	(2.42)	0.598**	(2.62)
Shared Network (1=Yes)	-0.227	(-0.83)	-0.169	(-0.63)	-0.205	(-0.76)
Child in the U.S. (1=Yes)	0.426	(1.02)	0.575	(1.39)	0.574	(1.38)
Urbanicity (1=Rural)	0.787**	(2.78)	0.746**	(2.86)	0.773**	(2.91)
Log per Capita HH Expenditure	-0.357**	(-3.19)	-0.389***	(-3.49)	-0.372***	(-3.32)
Education (Years - Men)	-0.011	(-0.37)	-0.012	(-0.41)	-0.013	(-0.45)
Age (Years - Men)	-0.030*	(-2.49)	-0.029*	(-2.41)	-0.030*	(-2.47)
Aspirations to Migrate (1=Yes)	0.439	(0.79)	0.351	(0.64)	0.442	(0.80)

Table 5b: Two-Level Random-Intercept Regression Model of Migrant Networks and Subsequent Migration

	(1)		(2)		(3)	
	b	(se)	b	(se)	b	(se)
<u>Couple and/or Female Migration vs. No Migration:</u>						
Patrilineal Migrant Network (1=Yes)	0.610	(1.72)			0.401	(1.09)
Matrilineal Migrant Network (1=Yes)			1.358***	(4.16)	1.251***	(3.73)
Shared Network (1=Yes)	0.109	(0.29)	0.138	(0.37)	0.176	(0.47)
Child in the U.S. (1=Yes)	1.753**	(3.04)	1.941***	(3.38)	1.906***	(3.31)
Urbanicity (1=Rural)	-0.194	(-0.49)	-0.159	(-0.42)	-0.211	(-0.54)
Log per Capita HH Expenditure	0.310	(1.93)	0.312	(1.94)	0.299	(1.83)
Education (Years - Men)	0.013	(0.29)	0.009	(0.21)	0.014	(0.31)
Age (Years - Men)	-0.074***	(-3.58)	-0.072***	(-3.51)	-0.071***	(-3.46)
Aspirations to Migrate (1=Yes)	1.182*	(2.18)	1.160*	(2.12)	1.051	(1.88)
n (Individual)	3,923		3,923		3,923	
n (municipality)	139		139		139	
$\sigma^2_{Municipality}$	1.092		0.742		0.808	
Log Likelihood	-704.951		-698.599		-695.947	

\*p<0.05 , \*\*p<0.01 , \*\*\*p<0.001  
Source: MxFLS-1 and MxFLS-

### *Migration Behavior*

Table 5a and 5b report the estimated coefficient and test statistics from the multi-level logistic regression model of migrant networks and migration behavior described by equation (2). The independent variables are introduced in an order identical to that of the aspiration models (table 3 and 4). Patrilineal migrant networks, which are introduced in model 1, are not significantly associated with subsequent migration only for female-only/couple migration relative to no migration. The coefficient estimate for Male-only migration is, surprisingly, both not significant and negative. 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 and female-only/couple migration. The estimated coefficient is greater for female-only/couple migration, but both are significantly greater than zero.

Model 3 simultaneously includes both patrilineal and matrilineal networks. For female-only/couple migration, patrilineal migrant networks are no longer significantly associated with migration to the U.S. once matrilineal networks are taken into account. For male-only migration, patrilineal migrant networks remain not significant, showing little change when model 1 is compared to model3. Shared networks are not significantly associated with male-only or female-only/couple migration.

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 U.S. predicts subsequent female-only/couple migration, which implies that a maternal tie is a significant factor in the decision to migrate. 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. Log per capita expenditure is a significant predictor of both male-only and female-only/couple migration, but in different ways. Greater log per capita household expenditure is associated with lower likelihood of male-only migration but a greater likelihood of female-only/couple migration. Being older age is also negatively associated with migration behavior. Aspirations to migrate significantly predict subsequent migration behavior, but only for couple/female-only moves.

## **9. Conclusion**

Our intent was to address two specific questions. The first asked 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 U.S. for married men and women. Similarly, patrilineal networks predict aspiring to migrate to the U.S. 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 networks in the U.S., 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 networks in the U.S. is significantly associated with aspiring to a future migration regardless of his wife's networks.

One potential explanation is rooted in gendered occupational niches in the context of destination. In other words, gendered networks carry information about potential employment that is gender specific. The results for females could therefore be a result

of information from female networks motivating women specifically as the information is of less utility to male members of a given pair. A similar case could also be made for male aspirants.

The second question asked if the gendered origin of migrant networks shaped subsequent migration behavior. Regardless of the type of migration – male-only vs. 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 them towards migration, but only the matrilineal networks lead to migration. That is not to say that male migrant networks don't matter as their role has been well documented in migration in general (STATACORP, 2009; KANAIAUPUNI, 2000; RIOSMENA, 2009; HONDAGNEU-SOTELO, 1994; GALETTO, 2009) only that for migration within a union it is the wife's network that seems to make more of a difference.<sup>7</sup>

The importance of matrilineal networks has not been documented in previous research and it raises a number of additional questions about the migration decision-making process. Although we consider this work to be an important first step, additional research should focus both quantitatively and qualitatively on the relative input of male and female members of a couple in the decision to migrate. Our understanding of the male-centered, labor migration does not necessarily translate once a union has formed. Future work would do well to account for not only the presence and composition of networks, but also their origin, which in certain circumstances may be the most relevant factor.

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<sup>7</sup> We are not aware of any study identifying whether the effect of the (patrilineal) networks varies by the marital status of the individual.

## References

- CERRUTTI, M., and MASSEY, D. (2001) "On the Auspices of Female Migration from Mexico to the United States." *Demography* 38:187-200.
- CREIGHTON, M. J. (2009). "The Role of Gender, Aspirations, and Family Structure in Mexican Education and Migration." Pp., *Sociology and Demography*. Philadelphia: University of Pennsylvania.
- CREIGHTON, M., PARK, H. and TERUEL, G. (2009) "The Role of Migration and Single Motherhood in Upper-Secondary Education in Mexico." *Journal of Marriage and Family* 71:1325-1339.
- CURRAN, S. R., GARIP, F., CHUNG, C. Y., and TANGCHONLATIP, K. (2005) "Gendered migrant social capital: Evidence from Thailand." *Social Forces* 84:225-255.
- CURRAN, S. R., and RIVERO-FUENTES, E. (2003) "Engendering Migrant Networks: The Case of Mexican Migration." *Demography* 40:289-307.
- DE JONG, G. F., STEINMETZ, M., KOK, P., GELDERBLOM, D., OUCHO, J. and VAN ZYL, J.(2006) *Migration Intentions in South Africa and Elsewhere*. Cape Town, South Africa: HRSC Press.
- DE JONG, G. F. (2000) "Expectations, Gender, and Norms in Migration Decision-Making." *Population Studies* 54:307-319.
- DURAND, J., MASSEY, D. S., and ZENTENO, R. M. (2001) "Mexican Immigration to the United States: Continuities and Changes." *Latin American Research Review* 36:107-127.
- FLORES, N. (2005) "The Interrelation between Social Context, Social Structure, and Social Capital in International Migration Flows to the United States." Pp., *Sociology*. Philadelphia: University of Pennsylvania.
- FOERSTER, R. (1925). *The Racial Problems Involved in Immigration from Latin America and The West Indies to the United States*. Washington D.C.: United States Department of Labor.
- FUSSELL, E., and MASSEY, D. S. (2004) "The Limits to Cumulative Causation: International Migration from Mexican Urban Areas." *Demography* 41:151-171.
- GALETTO, M. V. (2009) "Three essays on migration and local development in two rural communities of western Mexico." Pp. 180, *Doctoral Dissertation*. University of Wisconsin - Madison.



- GRANOVETTER, M. (1983) "The Strength of Weak Ties: A Network Theory Revisited." *Sociological Theory* 1:201-233.
- HANSON, G. H., and WOODRUFF, C. (2003). "Emigration and Educational Attainment in Mexico." Pp. University of California Working Paper.
- HONDAGNEU-SOTELO, P. (1994) *Gendered Transitions: Mexican Experiences of Immigration*: University of California Press.
- KANAIAUPUNI, S. M. (2000) "Reframing the Migration Question: an Analysis of Men, Women, and Gender in Mexico." *Social Forces* 78:1311-1347.
- KANDEL, W., and KAO, G. (2001) "The Impact of Temporary Labor Migration on Mexican Children's Educational Aspirations and Performance." *International Migration Review* 35:1205-1231.
- KANDEL, W., and MASSEY, D.S. (2002) "The Culture of Mexican Migration: A Theoretical and Empirical Analysis." *Social Forces*, 2002, 80, 3, Mar 80:981-1004.
- LINDSTROM, D. P., and LÓPEZ-RAMÍREZ, A. (2010) "Pioneers and Followers: Migrant Selectivity and the Development of US Migration Streams in Latin America." *The Annals of the American Academy of Political and Social Science* 630:53-77.
- LIVINGSTON, G. (2003) "Does membership have its privileges? Gender, social capital and employment outcomes among Mexican immigrants." Pp., *Sociology*. Philadelphia: University of Pennsylvania.
- MASSEY, D. S. (1990a) "Social Structure, Household Strategies, and the Cumulative Causation of Migration." *Population Index* 56:3-26.
- . (1990b) "Social-Structure, Household Strategies, and the Cumulative Causation of Migration." *Population Index* 56:3-26.
- MASSEY, D. S., and RIOSMENA, F. (2010) "Undocumented Migration from Latin America in an Era of Rising U.S. Enforcement." *The Annals of the American Academy of Political and Social Science* 630:294-321.
- MASSEY, D. S., and ZENTENO, R. M. (1999) "The Dynamics of Mass Migration." *Proceedings of the National Academy of Sciences of the United States of America* 96:5328-5335.
- MASSEY, D. S., DURAND, J. and MALONE, N. J. (2002) *Beyond Smoke and Mirrors: Mexican Migration in an Era of Economic Integration*. New York: Russel Sage Foundation.

- MASSEY, D. S., and ESPINOSA, K. E. (1997) "What's Driving Mexico-U.S. Migration? A Theoretical, Empirical, and Policy Analysis." *American Journal of Sociology* 102:939-999.
- MASSEY, D. S., GOLDRING, L, and DURAND, J. (1994) "Continuities in Transnational Migration: An Analysis of Nineteen Mexican Communities." *American Journal of Sociology* 99:1492-1533.
- MCKENZIE, D., and RAPOPORT, H. (2006) "Can migration reduce educational attainments? Depressing evidence from Mexico." Pp. 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* 118:549-599.
- PALLONI, A., MASSEY, D. S., CEBALLOS, M., ESPINOSA, K., and SPITTEL, M. (2001) "Social capital and international migration: A test using information on family networks." *American Journal of Sociology* 106:1262-1298.
- RABE-HESKETH, S., and SKRONDAL, A. (2008) *Multilevel and Longitudinal Modeling Using Stata*. College Station, Texas: Stata Press.
- RIOSMENA, F. (2009) "Socioeconomic context and the association between marriage and Mexico-U.S. migration." *Social Science Research* 38:324-337.
- RIOSMENA, F. (2006) "US Migration Dynamics in Mexico, Central America, and the Spanish-speaking Caribbean." Pp. in A. I. Canales ed., *Panorama Actual de las Migraciones en Latinoamérica*. Universidad de Guadalajara.
- RUBALCAVA, L., and TERUEL, G. (2006) *User's Guide for the Mexican Family Life Survey First Wave*.
- RUBALCAVA, L., TERUEL, G., THOMAS, D., and GOLDMAN, N. (2008) "The Healthy Migrant Effect: New Findings from the Mexican Family Life Survey." *American Journal of Public Health* 98:78-84.
- STARK, O., and BLOOM, D. (1985) "The New Economics of Labor Migration." *The American Economic Review* 75:173-178.
- STATA CORP. (2009) "Stata Statistical Software: Release 11." Pp. College Station, TX: StataCorp LP.
- XU, K., RAVNDAL, F., EVANS, D. B., and CARRIN, G. (2009) "Assessing the Reliability of Household Expenditure Data: Results of the World Health Survey." *Health Policy* 91:297-305.