

**Social Networks and Emigration From Paraguay to Argentina. The
Interrelation among Rural Migration, Urban Migration and Social
Networks.¹**

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Abstract

Argentina was historically the main destination for migration from neighboring countries in the southern cone of Latin America. Several studies have noted the importance of social networks in international migration. However, few have studied the specific roles played by social networks in the south-south migration in Latin America. In this paper we report findings from a recent survey of international migration from Paraguay to Argentina. The Survey of Paraguayans' Emigration (EEP2008) was done in migrant-sending communities in Paraguay. We present a comparative analysis of how social networks operate to promote the emigration of Paraguayans from rural and urban areas to Argentina. Differentiations of the uses are made in heads of households that have been reached by the survey, who have migrated on more than one occasion (that had made multiple trips at the time the survey was carried out). The discussion on rural and social networks is dealt with. We carry out a multivariate analysis to measure the effect of personal connections to migrants and whether the effect differs by place of origin, if they are from rural areas or urban areas to Argentina.

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Description of the topic to be studied

As several writers point out, Latin America and the Caribbean have been characterized by three patterns of international migration in the region: a) immigration from overseas, mainly from Europe, between the late nineteenth and early twentieth century b) Intraregional movements, namely movements within Latin America, which prevailed during the seventies c) international migration out of Latin America and the Caribbean, which picked up more pace from the eighties onwards. Such migratory patterns acquired regional particularities and in the case of Argentina, bordering immigration constitutes the main population contribution since the middle of the last century and although it can be said that has remained stable over the century, it became increasingly important compared to the contingent of European immigrants. Paraguayan immigration to Argentina has traditionally been located in border areas, but by the mid-century it became increasingly concentrated towards Gran Buenos Aires. The presence of Paraguayans in northeastern Argentina becomes evident from the late nineteenth century and early decades of the twentieth century being particularly important for the structuring of the territories and economies of border areas and responding to the demand for labor work of these rural areas. Following Meichtry and Beck's conclusions (1999) in their work, the presence of Paraguayans has always been prominent in the four provinces of northeastern Argentina, adding the Brazilians in Misiones and Corrientes and Uruguayans in the territories bordering the Oriental Republic in Corrientes. Since 1930, this presence of the Paraguayan population in the provinces of northeastern Argentina increased in response to the shortage of a local rural workforce. Basically this was a seasonal migration due to internal migration in the period; to fill jobs left by the natives.

Following Gonzalez and Borda (2009) in the first emigration flows up to 1947, driven by economic difficulties, poverty, inequality and lack of jobs the main destinations were the provinces bordering neighboring countries: Matto Grosso in Brazil, and Formosa, Misiones, Corrientes, Entre Rios and Chaco in Argentina. The main emigration process taking place in the 1950s and 1960s, was firstly as a result of instability and political persecution, and secondly lack of employment opportunities. Paraguayans migrated en masse to Argentina, especially to the capital Buenos Aires. A process that had been caused by the revitalization of the economy in the capital, which also involved the internal migration to the capital in Argentina, and Paraguayans from the border choosing Buenos Aires as their main destination. A new wave of immigrants from Paraguay to Argentina took place in the 1990s. Argentina has historically been the main destination of the Paraguayans. More recently there has been a new strong wave of migration toward Europe, especially Spain.

It is the intention of this paper to contribute to the knowledge of migration from Paraguay to Argentina taking the perspective of social networks as a focus of attention. The questions that guide the paper are: How important are the social

networks in the migration of rural and urban areas from Paraguay to Argentina? What is the interrelation among rural migration, urban migration and social networks?

Are there differences in use according to the social structure? In previous work (Gomez, 2008) we have highlighted the growing importance of social networks to facilitate the movement of Paraguayans towards Gran Buenos Aires. These networks are losing importance when we look at the border provinces destinations in comparative perspective. Thus, in the bordering provinces with the depletion of migration there is also a depletion of social networks that connect the social space of Argentina with Paraguay.

Immigration from Argentina to Paraguay is the largest of all currently in Argentina. Registering 325,000 (35% of total) of Paraguayans according to the Census of 2001 in Argentina which revealed a total of 923,000 people born in countries in the region reside in Argentina. The main geographical location is NEA (northeast Argentina), and Buenos Aires. Despite being the main migratory flow towards Argentina, there has been no academic research on the subject in Argentina or Paraguay. In the migration system in Latin America whose main destination is Argentina, Paraguayan migration has not been studied very much. In Latin America the largest numbers of studies are basically looking at the migrants' destination, few stop to explore the communities of origin and the impact that migration creates in communities.

Theoretical Focus

We agree with Massey (1999: 304) when he says that a satisfactory explanation of the movements must consider four dimensions:

- Structural forces in the societies of origin that promote migration.
- The structural forces in the societies of destination, which attracts migrants.
- The motivation, goals and aspirations of the actors respond to these forces through migration.
- The social and economic structures that emerging to connect the areas.

The theory of global systems is the conceptual framework that allows us to understand the forces that promote emigration from developing countries to developed countries, although this theory has its particularities and nuances to explain territorial movements within Latin America. Both the theory of world-systems whose highest exponent is Immanuel Wallerstein's and the theory of segmented markets and macroeconomic neoclassical theory offer explanations to understand the structural forces that encourage migration.

Theory of social capital and world-system theory, both are a explanation about how emerge structural links that connect areas of origin and destination.

Neoclassical microeconomics and the new economics of labor migration explain the individual motivations of people to migrate and the cumulative causation theory describes how international migration promotes changes in the personal motivations and socio-economic structures giving the perpetuation of a migration and a dynamic character. When considered within the theoretical spectrum, we focus on the theory of social capital and social networks to understand under what modalities connect sending communities with the areas of destination, within the framework of regional disparities between Argentina and Paraguay, but also in the rest of Paraguay.

In this paper we take the works of Douglas Massey and his colleagues as a reference, not as a mechanical adjustment but taking into consideration the specific features of Latin America and more specifically the particular aspects of the Paraguayan migration.

As indicated in Durand and Massey (2003), migratory networks are interpersonal ties that connect migrants with other migrants who preceded them and with non-migrants in areas of origin and destination through ties of kinship or friendship. These ties increase the possibility of international movement because of lower costs and risks of displacement, and increase migration's net income. The connections within the network are a form of social capital from which people can benefit by accessing to different ways of financial capital: employment abroad, higher wages and the possibility of savings and sending remittances (Durand, Massey, 2003). We must differentiate this approach from the network approach referring to social networks in which they are considered "strong"⁴.

Thus, for the first people that arrive in a new destination and do not have membership of a social network that supports them, migration becomes expensive, even more in the case of migration that has a strong restriction on the part of the States. But once they have settled down the potential costs for their friends and relatives are substantially reduced.

Due to the nature of the structures of kinship and friendship, each new immigrant forms a group of people with social ties at their final destination. Migrants inevitably relate to non-migrants, and non-migrants resort the implicit obligations to the relations of kinship, friendship and reciprocity to gain access to employment assistance at their final destination. (Durand, Massey, 2003) The networks make international migration something extremely attractive as a strategy to diversify risks and maximizing profits. When migrant networks are well developed, put within the reach of most community members opportunities to obtain work, and

⁴ In the Reticular perspective, relations are not intrinsic features the actor considered in isolation, relate to a property that emerges from the ties between two or more players: the relations depend on specific social contexts and are altered or disappear if a player is removed from the interaction with other actors (the teacher / pupil does not exist outside the school setting, for example) attributes remain in different social contexts (age, sex or income do not change if the individual is at home, work or church).

make emigration a secure and reliable source of income. At this point circuits and networks are formed, through which people; goods, information and money circulate. In that sense, migrants develop complex networks to facilitate migration and the adaptation of countrymen. More experienced migrants are a repository of knowledge about the other country, the labor market, the services available and all other aspects that define the ability to adapt to a new environment. This cultural capital can be handed down to other migrants, contributing to the formation of common values and social cohesion. The informal networks of migrants rely on family and community relationships and, in turn, help to generate an ethic of mutual support (Hakkert, Guzman, Martine, 2000)

Prior research in Mexico⁵ has documented the powerful role played by migrant networks in promoting emigration to the United States however there is no documentation on the role they occupied in the migration of Paraguayans to Argentina.

Furthermore, in keeping with new theoretical perspectives to capture the phenomenon, the concept of "migration systems" emerges as a constituent feature, international migrations are never just a part of migratory networks such as interpersonal decisions or actions of individual or collective. Rather, they are also influenced, albeit to varying degrees by political regulations, economic, social, networks do not operate in a social vacuum.

There is no uniformity in a number of points on the effects of social networks. The most important are the effects in different "migration systems". Social networks promote international migration; however, these effects are not uniform in different countries. There is no uniformity in a series of points which the less attention from empirical studies on the topic is the effect on rural and urban migration and when we consider the social structure of the migration.

According to Massey and Aysa non-uniform effects of social capital are:

- Variation depending on prior experience of migration. The first time, by definition, is not known to the society which runs it and the experiences of other social networks are critical. After the first trip the importance of social capital theory assumes cumulative causation of migration.
- Variation on whether the point of origin is rural or urban. Theory and research suggest that the influence of social capital will depend on the origin of the community. Interrelationships are much stronger in rural areas than the more anonymous urban ones. Several empirical studies have confirmed this hypothesis, in small towns where the effects of social capital on the probability of migration is higher than in urban cities. The regions are then on the one hand and small rural towns and other urban cities.

⁵ Flores, Nadia. (2006); Fussell, Elizabeth. (2004).Fussell, Elizabeth, and Douglas S. Massey (2004).

- Variation depending on the difficulty of travel and cost. A high cost of travel and high barriers to international migration imply that the importance of social capital is greater. Those who can add.
- Variation depending on gender

An area of study that has generated more attention in the study of migration is the construction of typologies that allow the classification and theoretical generalization. As noted Carrasou (2006:58) in general the analysis of the typology is moving in a field of great uncertainty, the factors that remain essentially are the spatial or geographic boundaries and causal factors that dominate the classification criteria. Obviously the generation of typologies is not without problems, however, in this context the classification space of migration has been one of the most useful. Both the cultural and political characteristics of the area of origin and the destination area contain elements that have contributed to differentiation.

Space is important in demography, it has been studied and that where people live and work can be an important factor in explaining their demographic behavior. However, as Hugo, Champion and Lattes (2003) our efforts to categorize the locations in censuses and surveys are still in its infancy. Typologies to distinguish settlements in the demographic analysis are commonly based on the urban-rural dichotomy. With the work we are interested in testing the influence of areas of residence in the use of social networks, as well as the analysis and to contrast with variables related to social structure, to analyze the social structure or space of residence are relevant for understanding the dynamics of functioning of social networks.

Data and Research Methods

To reach the objectives proposed we use The Survey of Paraguayans' Emigration (EEP2008)⁶. This project is modeled on the successful experiences of the Mexican Migration Project (MMP) and the Latin American Migration Project (LAMP) directed by Douglas Massey and Jorge Durand; however we made some important modifications to the questionnaire from Mexican Migration Project. The EEP2008 was conducted in 546 households from 32 localities of administrative regions: Central, Caaguazú, Alto Parana and Itapúa. The administrative regions were selected, based on data from the Permanent Household Survey of Paraguay, for its greatest potential both for its expulsores of population (measured as a percentage of households with migrants) and as remittances receiver. The questionnaire took data from characteristics of each locality (services, community activities, main economic activities), household (composition, housing, education and occupation of members), remittances (receipt, amount,

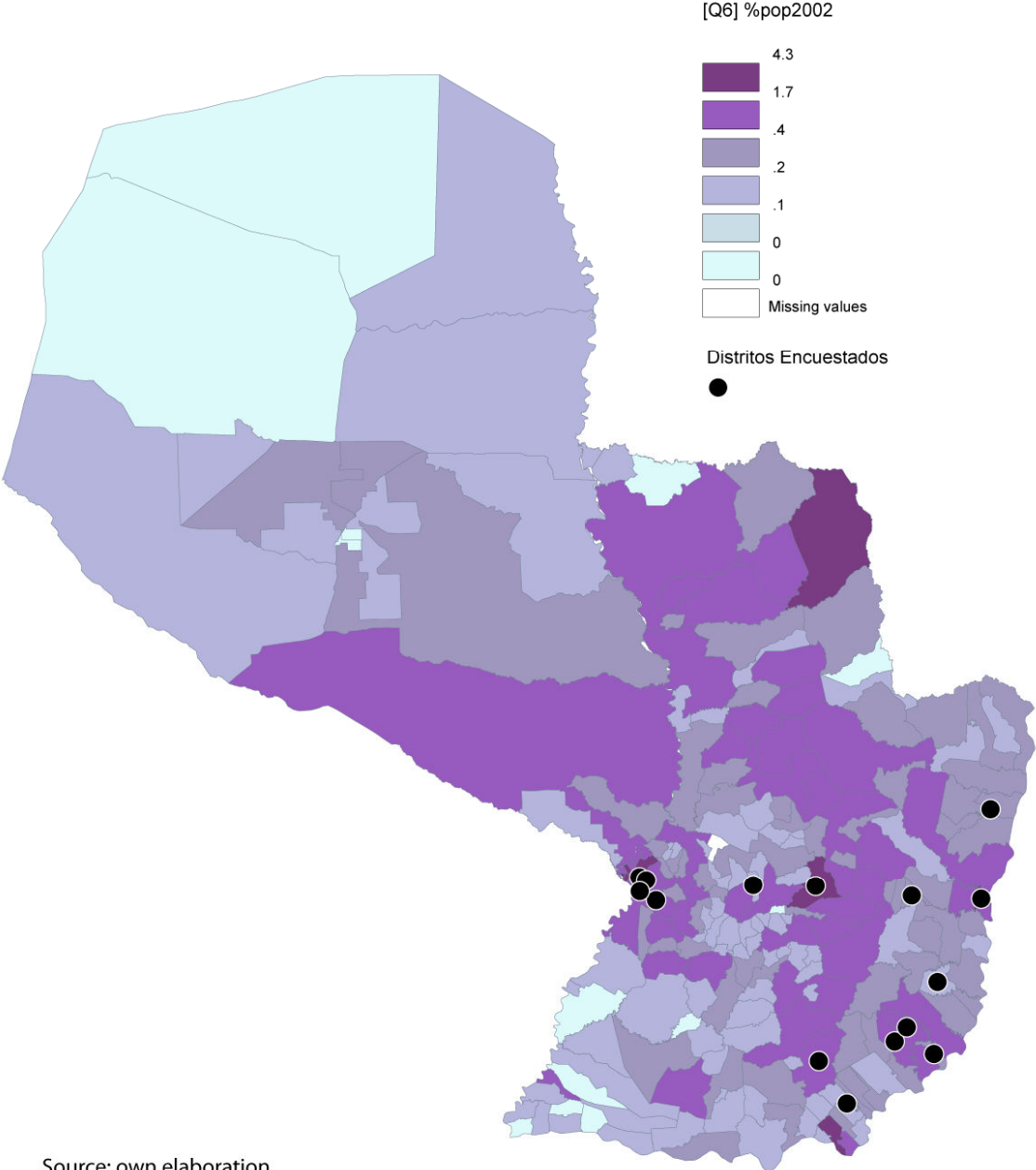
⁶ EEP2008 for the name in Spanish (Encuesta de la Emigración de Paraguayos 2008)

periodicity, use, average received), migratory networks (known people in other countries, aid that is received, offered or expected to be offered, migratory experience of parents or siblings of the head of household), members abroad and experience in international migration (reconstruction of the first and last departure from the country).

Households surveyed belong to different categories: with and without current emigrants, with and without migration experience of some member, receiving and non-receiving remittances and they are at different stages of the life cycle. Therefore it is possible to compare them at different levels. This survey was conducted in a cooperative manner between the National University of Cordoba (Argentina), the United Nations Population Fund in Paraguay, and the Association of Population Studies of Paraguay, and it was supported by the General Directorate of Statistics, Survey and Census in that country.

Using data from EEP2008, our intention is to provide empirical evidence on the particularities of social networks in the context of a longstanding Latin American migration as the case of Paraguayan migration mainly towards Argentina.

Survey of Paraguayans' Emigration(EEP2008)



Source: own elaboration
Made with Philcarto. <http://philcarto.free.fr>

The profile of the network of relationships and the generalization of a connected Paraguay.

As noted in various studies, the link between migrants and their families and friends have an important role in the migration process. The information provided by EEP2008 is illustrative of this. If we take as an indicator, that households that have Acquaintances, family members abroad or are receiving remittances, the empirical evidence is relevant. The percentage is remarkably high in the case of households that have Acquaintances; this is suggestive of high connections of both the urban and rural areas with people known to reside outside the country. This will be looked at in more detail later to analyze the characteristics and peculiarities of these links in different places of origin and demographic characteristics of the household, but draws attention to the multiple connections with the outside world that demonstrate the importance Paraguayan emigration. In relation to family members residing abroad in both the urban and rural, this reveals significant percentages 35% to 22% for urban and rural areas. In relation to households receiving remittances it is also an indicator of the networks of contacts that are ongoing. We will discuss this point later.

Table 1		
Area		
	Urban	Rural
Relatives living abroad	22%	35%
Receives Remittances	26%	33%
Acquaintances	99.1%	99.5%

Source: own elaboration. EEP08

This work aims to investigate possible differences in the use of social networks when we talk about migration from urban and rural areas. The information that can be seen from EEP08 shows that Paraguayan surveyed households have a connection that can be considered "strong", it is surprising that most households surveyed said to have acquaintances abroad, in both urban and rural areas. As seen in Table 2, when we analyzed where the contacts reside in rural areas, they are mainly contacts with Argentina, while in the urban environment it is interesting to note that the relations are not only in Argentina but also with Spain. .

Table 2

		Area	
		Urban	Rural
Countries where acquaintances live	Paraguay	.0%	.0%
	Argentina	53.1%	74.7%
	Spain	41.2%	18.7%
	Other Countries	5.7%	6.5%

Source: own elaboration. EEP08

In relation to the type of relationship the percentages do not show big differences, just note that the percentage of households that considered "friends" is slightly higher in urban areas while the percentage of contacts in the form of relatives is high in rural areas.

Tabla 3

		Area	
		Urban	Rural
Type of relationship	Relative	81.3%	88.7%
	Friends	9.1%	5.0%
	Acquaintances	9.1%	5.3%
	Spouse	.5%	1.0%

Source: own elaboration. EEP08

A point of particular importance to know is the diffusion of migratory culture with the immigrant networks where the communication links are maintained between migrants abroad and households in Paraguay. As we can see in Table 4 about 23% maintain communications once a week, maintaining similar values for the remaining frequencies in the communication

Table 4

		Area	
		Urbana	Rural
Frequency of communication	Once or more times per week	23.5%	23.4%
	Once or more times per month	24.2%	20.3%
	Every two or three months	9.3%	11.3%
	Every six months	4.2%	5.5%
	Once a year	11.0%	9.5%
	Never	27.8%	29.4%
	NR	.1%	.7%

Source: own elaboration. EEP08

Testing the effect of social networks

To test the effects of social capital we worked with migrants who were surveyed on the return to Paraguay. Differentiating and comparing those who had made only one migration trip with those who had made multiple migrations at different moments in time at the time of the survey.

To approach the problem set in the present work, we perform a logistic regression where the dependent variable is the probability that a household head that has been reached by the survey migrates more than once (that he had made multiple trips in the moment he answered the survey). The explanatory variables are related with networks, taking into account that the work objective is to explore the effect of the social networks has in migration. Hence, the arguments of the selected model are:

- Existence of acquaintances of the household in the destination (Acquaintances).
- Possession of some activity in the arrival moment at destination place, including study and work, as employee as well as self-employed (Activity).
- Way of obtaining the first job at destination place, that is, if the migrant was aided by a friend or had the job previous to the departure (Job obtaining).
- Existence of spouse or children before leaving the country (spouse or children).

As all these variables had responses for the first travel and the last one, we choose the criteria of taking the characteristic inherent to the most recent trip (the first and only for those who had migrated only once and the last one for those who had made multiple trips). We also tested other variables, such as working status previously to migrate, the fact of having received aid from their acquaintances, whether the migrants frequently

communicated with the people who had remained in Paraguay, and with the Paraguayan staying in the destination country. However, neither of them was statistically significant in the model, and was consequently not included in the final model.

Previously to present the regression results, we will account for the general characteristics of variables involved. They are shown in Table 1:

%	With	Without
Spouse or children	73,6%	26,4%
Acquaintances	93,4%	6,6%
Activity	89,3%	10,7%
Job obtaining*	46,3%	53,7%
N	121	

* In the case of the variable “job obtaining”, “with” means that the interviewed person had a previous job arrangement or received help when arriving his destination.

The aforementioned characteristics have a very different distribution within the sample. Firstly, 93% of household chiefs in migrant subset has any type of acquaintances, and 89,3% had an activity planned before getting to the destination place. This implies a strong presence of this attributes in the sample. However, the proportion of chiefs that had either spouse or children before migrating (74%) is lower, the same as the proportion of chiefs who had any network concerning job obtaining, i.e., a previous arrangement or help to obtain a job (46%).

Having described the variables to be introduced in the regression analysis, it is worth mentioning that To understand the choice of a logistic regression model, it is important to understand that it is one of the most widespread models of binary dependent variable, that is, a variable that takes on 1 when an event occurs and 0 otherwise. The focus is on the probability of the event occurrence:

$$P(y = 1 / x) = P(y = 1 / x_1, x_2, \dots, x_k)$$

where x represents the complete set of predictors.

The general formulation of binary dependent variable models is:

$$P(y = 1 / x) = P(y = 1 / x_1, x_2, \dots, x_k)$$

being G a link function which takes on values between 0 and 1 for all real numbers z. Thus, employing this function guarantees that estimated probabilities of occurrence are strictly included in the range [0-1]. In the case of logistic regression, G is the logistic function,

whose well-known characteristics are those which rapidly grow near $z=0$, and $G(z) \rightarrow 0$ when $z \rightarrow -\infty$ and $G(z) \rightarrow 1$ when $z \rightarrow \infty$.

This model is a special case of latent variable models. To obtain a latent variable, probabilities are expressed in odds:

$$P(y = 1/x) = \frac{\text{odds}(y = 1/x)}{1 + \text{odds}(y = 1/x)}$$

$$\text{odds}(y = 1/x) = \frac{P(y = 1/x)}{1 - P(y = 1/x)}$$

The Logistic Regression Model proposes that odds' natural logarithm is a linear function of independent variables then, considering $p = P(y = 1/x)$, it results:

$$\ln \frac{p}{1-p} = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k$$

which shows the relationship between predictors and probability. Further, relation among p and independent variables is not linear:

$$P(y = 1/x) = p = \frac{e^{x\beta}}{1 + e^{x\beta}}$$

Hence, coefficients' interpretation (considering probability as the dependent variable) is not direct, but it is necessary to perform a transformation on coefficients in order to obtain the effect of each predictor on the probability.

As this model involves latent variables in its formulation, it is not possible to estimate the parameters by means of Ordinary Least Squares (OLS). The model estimation is then obtained by Maximum Likelihood.

An interesting characteristic of the logistic regression model is that it does not make any assumption about independent variables distribution. It allows them to jointly come back with quantitative and categorical variables, which is difficult with other models' specification.

The results of the model with Paraguay migration survey are:

Variables	Coefficient	St. Error	Wald	Sig.	Exp. Coef.
Spouse or children	1,045*	0,488	4,583	0,0323	2,84
Acquaintances	2,031**	1,133	3,213	0,0730	7,62
Activity	1,602*	0,732	4,787	0,0287	4,96
Job obtaining	-1,287*	0,420	9,409	0,0022	0,28
Constant	-3,871*	1,391	7,748	0,0054	0,02
N	121				
Nagelkerke R ²	0,211				
Classification Ratio	68,60%				

*Statistically significant at the 95% confidence level.

**Statistically significant at the 90% confidence level.

The Nagelkerke R² is 21,1%, which is a low value, but we must consider the limited number of observations. Even more, classification ratio, that is, the number of coincidences between predicted and observed cases, is 68,6%, which is a considerable magnitude. It is also worth mentioning that all variables are individually statically significant.

The existence of acquaintances has the greatest effect on the probability of having multiple migrations, highlighting the importance of networks in the event of migration. It is also relevant the fact that the household head has an activity previous starting the trip. Contrary to what intuition may suggest, that having spouse and children could act as a liability factor in terms of network, discouraging household head to migrate, its effect on the probability of multiple migration is positive, possibly because of the greater need for resources that a family implies. Finally, network aid to get a job in destination place have a positive but slight effect on probability.

In order to test the hypothesis that the area where people live is a determinant of the probability to migrate, we included this variable (that distinguishes between rural and urban areas) in the regression. It must be taken into account that 64% out of the 121 cases included in the analysis are located in urban area and 36% in rural space. The results are shown in the following table:

Variables	Coefficient	St. Error	Wald	Sig.	Exp. Coef.
Spouse or children	1,078*	0,493	4,785	0,0287	2,94
Acquaintances	2,026**	1,132	3,205	0,0734	7,58
Activity	1,586*	0,735	4,655	0,0310	4,88
Job obtaining	-1,219*	0,426	8,191	0,0042	0,30
Area	0,367	0,426	0,739	0,3901	1,44
Constant	-4,040*	1,408	8,233	0,0041	0,02
N	121				
Nagelkerke R ²	0,218				
Classification Ratio	68,60%				

*Statistically significant at the 95% confidence level.

**Statistically significant at the 90% confidence level.

Even though the Nagelkerke R² has risen 7 thousandth, the variable representing the type of area of residence is not statistically significant. This could be suggesting that migration patterns are not so different between urban and rural origins. This is particularly interesting because rural spaces have a considerable weight in Paraguayan life.

Some of our hypothesis that we had was that the places of origin of the Paraguayan emigration were important when we look at the specific usage patterns of social networks. This was not significant but we must make a series of considerations, first, how the statistics in Paraguay take into account the concept of rural and urban settings, as after the research, it became apparent that it was complicated to differentiate the urban and rural setting in relation to comparisons with definitions of such settings in other countries. The criteria for categorizing urban and rural settings, is a political and administrative one.

An interesting possibility in further research would be, to take other factors into account when defining urban and rural areas i.e. not simply following the political definition of urban and rural. Therefore in order to test the differentiation of the use of social networks, we incorporate variables related to the social structure. Our hypothesis is that the different sectors in distinct points in the social structure can make other uses of the social network. We must consider that in this paper we are only analyzing the module of the heads of households taken on the return survey. We take certain socio-demographic variables as proxies of social structure, under the assumption that different social structure makes a differential use of networks. Such variables would allow us to talk about peculiarities in the social structure and its correlation with the hypothesis of the networks. To reach the objective, socio-demographic variables were added to models as proxies for social structure.

Another hypothesis is that, instead of the area of residence, socio-demographic conditions influence the probability to migrate. In this direction the question is redirected to

whether a relationship exists between the socio-demographic structure and the probabilities that the heads of households have made multiple trips

To incorporate variables in this direction, considering the limitation posed by data source⁷ and the need to avoid including a great number of variables, a principal component analysis was performed to reduce data dimensionality.

A methodological drawback of this technique is that it only permits to collapse numeric variables, not nominal ones. So it was necessary to choose this type of variables from Paraguay migration survey. The variables employed then are:

- Average age of household members.
- Household dependency rate (number of inactive members out of number of active ones).
- Household activity rate (ratio between economically active members and total number of members).
- Number of persons per room.

The basic position and dispersion measures that characterize these variables are:

<i>Descriptive statistics</i>	Minimum	Maximum	Mean	St. Dev.
Average age	10,00	66,00	28,68	11,89
Dependency rate	0,00	5,00	1,07	1,04
Activity rate	0,00	1,00	0,45	0,24
Persons per room	0,25	10,00	1,67	1,13
N	121			

The subset of households with a migrant chief has average ages (per household) between 10 and 66 years old, and most household have an average age around 29 years old. The number of inactive persons per active one within each household (dependency rate) arises to 5 but, on average, there is a little more than one inactive person per active one in each household. The activity rate also give a good signal, because on average, half members of the household pertain to Economically Active Population (i.e., they are employed or searching for a job). Finally, the number of persons per room is less than two on average, and the maximum number of persons in a room is ten. This description gives a preliminar intuition that the subset of households with migrant chief is not biased towards the most vulnerable strata. However, it must be taken into account that all variables present very high dispersion (variation coefficients are between 41% and 97%), so these results are not determinant.

The technique used was the principal components analysis. Principal component analysis is a technique of dimensionality reduction which constructs new variables as linear combinations of original ones. By this means, it allows to collapse and, consequently be

⁷ Given the focus of the survey on migration, the number of variables regarding socioeconomic and demographic factors are limited.

introduced in a regression analysis, a set of correlated variables avoiding multi-collinearity. The new variables, named *principal components*, are uncorrelated among each other, because they are projections of original variables over a new set of orthogonal axes. Given a set of p variables, the first new axis, X_1 , constitutes a new variable, x_1^* , so it collects the maximum variance as possible. The second axis, orthogonal to the first one, is constructed so that the new variable attached to it, x_2^* , reflects the maximum variance not involved in the first new variable, x_1^* , and x_1^* and x_2^* are uncorrelated to each other. This procedure continues until all new p axes are identified, such that new variables, x_1^* , x_2^* , ..., x_p^* collect in turn the maximum variance and are mutually uncorrelated. The maximum number of new variables or principal components is equal to that of original ones.

This analysis is particularly useful because it allows to represent p variables in an m -dimensional space, m being less than p . The addition of variance of new variables which are not kept in the analysis represents a measure of information loss resulting from data reduction. Whether or not this loss is significant depends on the main purpose of the study.

The model can be represented as follows:

$$\begin{aligned}\xi_1 &= w_{11}x_1 + w_{12}x_2 + \dots + w_{1p}x_p \\ \xi_2 &= w_{21}x_1 + w_{22}x_2 + \dots + w_{2p}x_p \\ &\vdots \\ \xi_p &= w_{p1}x_1 + w_{p2}x_2 + \dots + w_{pp}x_p\end{aligned}$$

being $\xi_1, \xi_2, \dots, \xi_p$ the p principal components and w_{ij} the weight or *loading* of j -th variable in the i -th principal component. The greater the loading, the greater the influence of the respective variable on the component. Then, loadings are very relevant in order to give a proper interpretation to the components. The loadings satisfy the following conditions:

$$\begin{aligned}w_{i1}^2 + w_{i2}^2 + \dots + w_{ip}^2 &= 1 & i = 1, \dots, p \\ w_{i1}w_{j1} + w_{i2}w_{j2} + \dots + w_{ip}w_{jp} &= 0 & \forall i \neq j\end{aligned}$$

such that the first condition guarantees that the variant gathered by a component is not affected by scale, and the latter assures orthogonal axes. The variance retained by i -th component, denoted λ_i is the eigenvalue of the variable. The decision on how many components to retain depends on the how much variance the researcher is prepared to lose. However, one of the most spread criteria is to retain only factors with eigenvalues greater than one. This rule balances the trade-off between the need to retain as much variance as possible, and the wish to minimize the number of variables to be introduced in the model.

A final comment about this technique is that it only permits to collapse numeric variables,

not nominal ones. So it was necessary to choose this type of variables from Paraguay migration survey. The variables employed then are: average age of household members, household dependency rate (number of inactive members out of number of active ones) and activity rate (ratio between economically active members and total number of members), and number of persons per room.

From principal components analysis, only one component is retained, following the criteria previously described. The loadings are shown in the following table:

Variables	Component
Average age	0,72
Dependency rate	-0,71
Activity rate	0,87
Persons per room	-0,63
Variance retained (%)	54,39%

Having retained only one component, this analysis gives us the opportunity to collapse all variables in one indicator of socio-economic condition. Given the signs of loadings, the magnitude of the aforementioned indicator grows with socio-economic level. It is possible now to introduce this variable in the regression.

Further, another two variables regarding socio-economic characteristics were introduced:

- Education level, as reported by years of formal education⁸.
- Bad housing, which takes on 1 if the household live in a building not specially constructed for housing purposes (not house or apartment, with no provision of water by a pipe within the house, or built in inadequate materials).

<i>Descriptive statistics</i>	Minimum	Maximum	Mean	St. Dev.
Education	0,00	17,00	6,69	3,48
Bad housing	Yes 76%		No 24%	
N	121			

- In the table shown above, it can be seen that the average education level of the subset is equivalent to complete primary school. Also, 76% of the households included in the subset live in a place not constructed with the objective of being a house. This counteracts previous intuition drawn on social characteristics, allowing to conclude that people in the subset is in a vulnerability situation.
- Estimation results including socio-economic conditions are:

⁸ An essay was made introducing this quantitative variable into the principal component analysis, but it was not worthy because it added an additional component, whose greatest loading was that one related to education level. So, it is appropriate to introduce it in a separate way.

Variables	Coefficient	St. Error	Wald	Sig.	Exp. Coef.
Spouse or children	1,059*	0,508	4,350	0,0370	2,88
Acquaintances	2,221**	1,175	3,572	0,0588	9,22
Activity	1,603*	0,746	4,609	0,0318	4,97
Job obtaining	-1,318*	0,429	9,435	0,0021	0,27
Component	-0,098	0,213	0,211	0,6456	0,91
Education level	0,024	0,062	0,145	0,7029	1,02
Bad housing	-0,228	0,510	0,201	0,6541	0,80
Constant	-4,041*	1,635	6,105	0,0135	0,02
N	121				
Nagelkerke R ²	0,217				
Classification Ratio	68,60%				

*Statistically significant at the 95% confidence level.

**Statistically significant at the 90% confidence level.

The direction of the effect and relative magnitude of the coefficients of variables included in the first basic model do not significantly change. Further, variation proportion explained by the model neither modifies, and the new variables (regarding socio-economic conditions) are not statically significant. They should not be introduced in the model then, because they do not add any important matter to the explanation of probability to migrate repeated times. This could be explained by the fact that the whole subset share certain characteristics (bad housing conditions, low level of education) which are indicating an homogeneity as regards socio-economic level. We can conclude that most households whose chief migrates are vulnerables. The times the chief migrates do not depend on their life quality not because of independence of migration from socio-economic level, but because all of them have a similar living standard.

A final comment must be made on the data source: it is necessary to remember that data source is a survey which is not intended neither to be representative nor to provided a great number of cases. And this fact could be interfering in the results of the model.

To conclude, results are very suggestive about importance of networks in migratory decisions, but the influence of area or socio-economic condition, though not identified here, cannot be neglected. There is plenty room for further research.

Conclusions

The aim of this communication was to contribute to the knowledge of the Paraguayan migration to Argentina from a perspective that privileges the social networks as a focus of attention. The analytical perspective that guided the analysis was the work of Massey and his colleagues in order to capture the particularities of Latin America. When we consider the profiles of the network of relationships, the data suggests that the home communities of the Paraguayan migration are strongly linked to migratory networks. It is worth noting that urban areas are more linked to Spain than rural ones. Argentina being the main link of rural areas. If we consider other distinctive features such as the type of relationship and frequency in communication, we observed no significant differences between the two areas of origin.

The intention was to generate empirical evidence on the direction of linking two dimensions: first, if there is relation between the use of social networks and the area of origin of migration. On the other hand, progress in the understanding of whether a relationship exists between the dynamics in the use of social networks and the socio-demographic characteristics of individuals, taking this as a proxy for the correlations between social structure and use of social networks. The advance in the understanding of migration through such particularities allows us to study in detail what happens inside Paraguayan migration. We must look at other dimensions in terms of specific migration dynamics, both as we look at the urban and rural areas as well when we consider variables related to social structure. Regarding the empirical evidence on the use of networks for the case of Paraguay areas of origin of those migrants return does not appear to be an indicator of peculiarities in the use of networks. As for variables related to socio-demographic structure the empirical evidence does not talk about specifics. However, this must be nuanced because we only consider the migrants return. Considering the other variables involved, we could advance the hypothesis when we consider specific areas of urban and rural. To conclude, results are very suggestive about importance of networks in migratory decisions, which provides empirical evidence for the southern cone of Latin America but the influence of area or socio-economic condition, though not identified here, cannot be neglected. There is plenty room for further research. The EEP08 allows us to use the data collected for analysis and future size of dynamic comparative analysis of migration.

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