

The Cathie Marsh Centre for Census and Survey Research

Personal Support Networks of Immigrants to Spain: A Multilevel Analysis

CCSR Working Paper 2009-07

Veronica de Miguel, Mark Tranmer

vdmiguel@uma.es, mark.tranmer@manchester.ac.uk

Immigrant flows to Spain have increased in the last decade, but little is known about the composition and role of personal support networks of immigrants to Spain. Our research questions are 1) to what extent are Spaniards, (more settled Spanish residents) present in an immigrants' network, compared with non-Spaniards, such as other recent immigrants? 2) Which factors are associated with ties between immigrants and Spaniards compared with immigrant ties to non-Spaniards? 3) Does the support role of non-Spaniards and Spaniards differ? We analyse personal network data where each immigrant was asked about the role of their support network. Data were collected at two time points: 1) the first three months in Spain since the immigrant arrived, and 2) the six months previous to the survey interview. Multilevel logistic regression models are applied; the dependent variable is whether the immigrant has a tie to a Spaniard alter, as opposed to a non-Spaniard. We determine the characteristics that are most strongly associated with the probability of a tie between an immigrant and a Spaniard, including characteristics of the alters, the immigrants (ego), the relative characteristics of ego-alter, geographical factors and support roles. We use single-level ordered logistic regression models to investigate factors associated with the total *number* of Spaniards in the support network. Attributes of alters and egos are found to be important in predicting ties between immigrants and Spaniards, and to predict the total number of Spaniards in an immigrant's network, especially the country of origin of the immigrant.

PERSONAL SUPPORT NETWORKS OF IMMIGRANTS TO SPAIN: A MULTILEVEL ANALYSIS

Verónica de Miguel – Migration Research Group, Autonomous University of Barcelona, Spain

Mark Tranmer – Centre for Census and Survey Research, University of Manchester, UK*

Abstract

Immigrant flows to Spain have increased in the last decade, but little is known about the composition and role of personal support networks of immigrants to Spain. Our research questions are 1) to what extent are Spaniards, (more settled Spanish residents) present in an immigrants' network, compared with non-Spaniards, such as other recent immigrants? 2) Which factors are associated with ties between immigrants and Spaniards compared with immigrant ties to non-Spaniards? 3) Does the support role of non-Spaniards and Spaniards differ? We analyse personal network data where each immigrant was asked about the role of their support network. Data were collected at two time points: 1) the first three months in Spain since the immigrant arrived, and 2) the six months previous to the survey interview. Multilevel logistic regression models are applied; the dependent variable is whether the immigrant has a tie to a Spaniard alter, as opposed to a non-Spaniard. We determine the characteristics that are most strongly associated with the probability of a tie between an immigrant and a Spaniard, including characteristics of the alters, the immigrants (ego), the relative characteristics of ego-alter, geographical factors and support roles. We use single-level ordered logistic regression models to investigate factors associated with the total *number* of Spaniards in the support network. Attributes of alters and egos are found to be important in predicting ties between immigrants and Spaniards, and to predict the total number of Spaniards in an immigrant's network, especially the country of origin of the immigrant.

Keywords: personal networks, immigrants, support, social integration, Spain, multilevel analysis

* Verónica de Miguel-Luken. Urb. Sueño Azul, 2 (29790 Benajárfate, Málaga-Spain). vdmiguel@uma.es, tel. 00 34 952 515 174, fax: 00 34 952 271 627.

Mark Tranmer. School of Social Sciences, Kantorovich Building, Humanities Bridgeford Street Building, Manchester M13 9PL (UK), mark.tranmer@manchester.ac.uk, tel. (44) 0161 275 4744, fax: +44 (0) 161 275 4722.

1. Introduction

Immigration to Spain has increased greatly in the last decade. Since the middle of the nineties this phenomenon has become much more visible. Historically, most immigrants came from North Europe and Morocco, but more recently immigrants to Spain have origins in many other countries. According to official data, recent immigrants accounted for 1.6% of the total population in Spain in 1997, reaching 10% in 2007*.

The effect of this large influx of people in such a concentrated period of time has attracted the attention of the media, the public and academics. The three main priorities for recent academic research on immigrants to Spain are: firstly, to get a basic socio-demographic profile of this new population; secondly, to review the progress of the flows; thirdly, to assess the nature and extent of social integration of recent immigrants with 'Spaniards'. We define Spaniards here as the more settled resident population of Spain, as opposed to other recent immigrants, and use this definition for the remainder of the paper.

In recent years researchers in a variety of countries, including Spain, have been more and more interested in concepts such as 'social capital', 'social support', 'migratory networks', and 'migratory chains', and their association with social integration. Although discussion of these concepts is now quite common in the literature, it was in the nineties when terms like 'social capital' saw more widespread use, although consensus was not always found on the precise definition and substantive use of such measures. However, epistemological theories started to be developed, and the influence of *meso* processes (in between macro and micro processes) on the social networks of immigrants started to be widely discussed (Portes and Böröck 1989, Gurak and Caces 1992; Massey, Arango et al. 1993; Portes 1998). It seemed obvious that the available social support at the destination, usually offered initially by other immigrants, was crucial to modulate the rhythm, direction and intensity of the forthcoming flows and an important factor in attenuating the impact of first settlement (Gurak and Caces 1992; Massey, Arango et al. 1993; Palloni, Massey et al. 2001).

Social integration, however, is not always made easy by having resources available at the destination when these are limited to similar (homophilic) actors with respect to nationality or occupation. Social pressure by other recent immigrants from the same country of origin and the consequential lack of contact with Spaniards have been argued as the main reason why the personal networks of immigrants may be somewhat encapsulated (Portes and Sesenbrenner 1993; Bates 1994; Maya Jariego 2004), mainly in what Portes and Böröck (1989: 618) call 'handicapped contexts of reception'. It is not just the existence of support relationships with people from the same culture, but also with people from the receiving culture that best predict successful social integration (Berry 1997). The existence of ties to Spaniards in the personal support networks of immigrants, and the number and role of these ties to local actors can thus be considered as key indicators of the degree of accommodation of the immigrants in the new environment (Martínez García, García Ramírez et al. 2002).

* *Padrón de Habitantes*. Data available at <http://www.ine.es>

Over the last 15 years, as methodological approaches and software for Social Network Analysis (SNA) have been developed, researchers have become more interested in their application and consequently the number of studies in the social sciences that have combined social theory with these new ways of describing and modelling networks has increased. At present, numerous scholars are researching mobile populations in Spain with respect to social and personal networks (Molina 2007). At the micro level, network structural and compositional characteristics are normally considered to explain different sorts of individual behaviour, such as the identification of immigrants with the receiving society (Lubbers, Molina et al. 2007), sense of community (Maya-Jariego and Armitage 2007), psychological or general well-being (Martínez García, García Ramírez et al. 2002; Miguel Luken, Solana Solana et al. 2007), or evolution of migratory chains (Miguel Luken, Solana Solana et al. 2007). In these studies, particularities of the network structure and network members' attributes are presented in an aggregated way, as means or percentages, in order to make them act as covariates in single-level regression models.

Other researchers have considered the network itself as the *dependent* variable. From this perspective, SNA has been used differently in migration-based research. For instance, SNA has been employed to visualize and to better understand the patterns of flows in internal migration (Abad Montes and Vargas Jiménez 2004); to study the changes of Erasmus friendship networks through time and their influences on relational integration and identification (de Federico de la Rúa 2003), to determine the structural position and role of 'host individuals' in the personal networks of immigrants (Domínguez and Maya Jariego 2008), or to examine the friendship networks of Spaniards and children of immigrant origin in schools (Miguel Luken, Carvajal Gutiérrez 2007).

In this paper we move a step forward from previous studies by focusing on the composition of immigrant support networks in a multilevel analysis. Specifically, we offer a new insight into the determinants of a tie between a Spaniard and an immigrant that allows us to disentangle effects due to characteristics of alter, characteristics of ego and the relative characteristics of alter to ego, as well as contextual variables for the local area to which the person has moved. Ties from immigrants to Spaniards help to build bridges that diversify the access to resources, and help immigrants to integrate with the Spanish population in both a psychological and an instrumental way, but which ego, alter and contextual characteristics make this interaction more feasible? By adopting a multilevel approach we can answer these important substantive questions. We note that Snijders, Spreen et al. (1995) and Van Duijn, van Busschbach, et al. (1999) first used multilevel analysis to investigate personal networks, albeit to answer different relevant research questions, and we build on some of their conceptual ideas here.

It is useful to summarise what we are modelling here in terms of the dependent and explanatory variables. The respondents (immigrants) have named, at two time points, the closest people in their personal support network. Although the questionnaire design was such that information about nominees' attributes was collected for a maximum of six alters at the two different time points, a very small proportion of immigrants named more than six and some of them named less than six, though this does not present problems in the multilevel approach. A tie, therefore, exists between ego (who is always an immigrant) and alter (who can be either another recent immigrant or a Spaniard). In the multilevel analysis immigrant (ego) represents level 2 of a two level hierarchy, and

alter (Spaniard or non-Spaniard) level 1. We assume no overlap between the alters of one ego and the alters of other egos; a similar assumption was made by Snijders and Sreen (1995) and whilst this may often be a strong assumption, it is reasonable here as there is very minimal (if any) overlap of the alters from different egos in our data due to the sampling method adopted. For both alters and egos, we have a range of socio-demographic variables including age, occupation and gender. We also have asked the egos about the support role of each alter they have named. Because we know the attributes of alter and ego, and because we are using a multilevel analysis, we can also construct covariates to indicate the similarity of ego and alter in terms of age, occupation, gender and so on. Moreover, given the country of origin and occupation of the ego we are able to construct contextual variables with respect to the local area to which the immigrant has moved, such as the percentage of people from the same country of origin in that local area.

Given this rich data structure and the fact that a tie from an ego to an alter exists, we are hence interested in the probability of a tie from an immigrant being to a Spaniard as opposed to another recent immigrant (i.e. a non-Spaniard), given the attributes of the ego, the alter, the alter-ego similarity of these attributes, population characteristics of the area the immigrant has moved to and the support roles provided. A multilevel approach thus allows all these features of the data to be modelled and hence variations in the probability of an ego being tied to a Spanish alter to be explained and understood in substantive terms, with important implications for understanding and promoting social integration, as well as demonstrating the value of the multilevel approach for this kind of substantive research problem.

2. Research questions and hypotheses

The two main research questions here are as follows:

- 1) To what extent are Spaniards present in immigrants' personal support network at the two time points of interview?
- 2) Which characteristics of the alter, the ego, the alter relative to the ego, the local area to which the immigrant has moved, and the support role best predict the probability that a tie from an immigrant is to a Spanish alter?
- 3) Which factors are most strongly associated with the total number of Spaniards in ego's personal support network?

Research question 1 may be answered through a descriptive analysis. For question 2 we will use multilevel modelling approach, and for this research question we set out below various hypotheses, each of which relates to the way in which probability of a tie between an immigrant (ego) and a Spaniard alter is associated with various characteristics. For question 3 we employ single-level ordinal logistic regression models with ego-level data.

Alter's attributes

Previous research has stressed the positive correlation between academic qualification level and positive feeling towards immigrants. If this is true for our data, then we would expect better-qualified Spaniards are generally likely to be over-represented in the support networks. If we presume that people with a better perception of immigrants will

be more willing to interact with the newcomers, we should also find that male and younger people will be over-represented among alters, as some studies have pointed out (CIS Barometers[†]; Calvo Buezas 2003; Gualda Caballero 2005; Moya Morales and Rodríguez -Bailón 2002; Rinken and Pérez Yruela 2007).

Ego's attributes

The ego is always an immigrant, and to a large extent the relative socio-demographic characteristics of the ego to those of the alter will best determine the probability of a tie between an immigrant and an alter that is a Spaniard. However, the place of origin of the ego will be associated with the probability of a tie between an immigrant to a Spaniard, as measured through the variable 'place of birth'. Previous research has revealed significant differences in opinions and attitudes from Spaniards toward immigrants when their geographical origin is known. Africans are normally the worst positioned in the rankings, Maghrebins being the least favoured. Also, Eastern Europeans and Latin-Americans do not receive much favour (CIS Barometers, Miguel Luken and Carvajal Gutiérrez 2007, Rinken and Pérez Yruela 2007). If this is the case, we expect it will be reflected in the results of our models; African immigrants will have a lower probability of having a tie to a Spaniard.

Language skills could be also considered here: the better the immigrant's knowledge of Spanish, the easier communication with Spaniards is, and this increases opportunities of exchange and interaction. However, in some cases knowledge of Spanish will be correlated with country of origin: for example, almost all Latin-American immigrants have Spanish as a mother tongue.

Another important characteristic of the ego to consider is the effect of his or her human capital. Academic literature normally states that there is a positive correlation between the extent of human capital of the ego and extent of support provided by their personal network, so that higher social status of the ego would favour his/her access to a wider range of resources (Granovetter 1982, Wellman and Wortley 1990). However, for immigrants, this effect may lose some of its importance because of the difficulty of getting official recognition in Spain of the prior social status or skills gained in the country of origin (Shah and Menon 1999). We expect that a higher academic level of the ego, and previous knowledge of the destination in Spain through friends or through earlier temporary visits to the country may contribute to the probability of ties to Spaniards.

We can also consider whether the immigrant is a 'pioneer'. In other words, whether friends or acquaintances from the same country of origin as the immigrant have already moved to Spain or not. If they have, then the immigrant is not a pioneer. If the immigrant is not a pioneer, he/she would probably get their initial support through the acquaintances that have already acquired some experience in the place, lessening the possibilities of exchanging support with Spaniards. Thus, we might expect that pioneers are more likely to have ties to Spaniards than non-pioneers.

[†] The 'Sociological Research Centre' (*Centro de Investigaciones Sociológicas*, CIS), regularly asks the population, through its 'barometers', about their attitudes toward foreigners and feelings about the immigration phenomenon. Results can be found at http://www.cis.es/cis/openem/ES/2_barometros/depositados.jsp. The latest report on the topic is number 2731 (15th September 2007).

Relationship between ego and alter's attributes

To what extent is there homophily (similarity) between ego and alter in the context of immigrants to Spain? Homophily is known to be an important explanatory factor for the configuration of personal networks (Marsden 1988; Louch 2000; McPherson et al. 2001): people tend to interact more often with those who share a similar socio-demographic profile, mainly according to sex, age, academic level and geographical location. For those immigrants who are employed, we can also consider the relative occupations and job roles of ego and alters with respect to ties between immigrants and Spaniards.

Local area characteristics

If the immigrant's destination is a local area where the presence of co-nationals is high, it is very likely that their support network will comprise ties to people with similar cultural antecedents and circumstances. Thus as the proportion of other people in the local area from the same country of origin as the immigrant increases, we expect the probability of a tie from an immigrant to a Spaniard will decrease.

Support roles

Ties between some support roles may be more likely for ties between immigrants and Spaniards, and others more likely for ties between immigrants and other recent immigrants. Here we consider how help finding accommodation, borrowing money and finding a job are associated with ties between immigrants and Spaniards, as opposed to non-Spaniards.

3. Methodology

3.1. The survey

We use our own data, collected through face-to-face interviews in several subdivisions of the following provinces in Spain: Huelva, Cáceres, La Rioja, Navarra, Gerona and Alicante. Fieldwork was carried out between April and October 2004 in small cities and rural areas, and a stratified random sample was used to select adult people to be surveyed, using nominal official registers (*Padrón Municipal de Habitantes*) as the sample frame.

The questionnaire was designed in order to gather information about socio-demographic characteristics of the immigrants, their migratory trajectories and their personal support networks. Regarding the latter, three different sets of questions were incorporated: first, *name generators*, with the objective of identifying members of the personal network. Secondly, *name interpreters*; to define some attributes of the elicited alters – for example: sex, age, geographical origin – and to provide some clues about the network composition. Finally, the relationship between pairs of alters was recorded in a matrix to provide insight into the group structure (Requena Santos 1996; Flap, Snijders et al. 1999-2003; Van der Gaag, Snijders et al. 2006).

Furthermore, our name generators combined *realistic* and *exchange* approaches already discussed in preceding studies (Laumann 1973; Fischer 1982; Burt 1984; Völker 1995; Requena Santos 1996; Straits 2000; Marsden 2003), although the lack of previous applications to research on foreign populations meant that we had to adapt these ideas to our substantive area of study. By considering both approaches and by including several questions for each relationship we studied, we tried to avoid, as far as possible, the problems caused by linguistic difficulties or cultural misunderstandings.

Regarding the types of support exchanged, we focused on help with respect to housing, exchange of money or goods, work and general knowledge about the new environment. That is, *information* as a way to access resources and *practical instrumental support*, comprising more mechanical or material services (Van Der Gaag and Snijders 2003). Although we were also aware of the importance that companionship and emotional support may have for successful immigration, we did not centre our attention on these aspects because we did not want to make the questionnaire, or the time needed to complete it, too long. Besides this, we had observed different reactions toward these topics during the pilot phase, and this was another reason why questions on these were not included in the questionnaire.

We adopted a retrospective approach to capture the change in two time-points of the personal support coverage of the immigrant. We inquired about his/her first three to four months in Spain, since the first period in a new place is often the most difficult, and the social resources are mostly achieved by means of very few active actors, like relatives or friends. Immigrants were also asked about their last six months in the country, once they were supposed to be more settled down, and the dependence on close acquaintances may be less strong. As it was hypothesised, egos prevail as receivers of support in the beginning and turn out to be more likely to be providers of support once they are settled (Table 1) (see also: Miguel, Solana et al. 2007).

Table 1: Mean number of alters

	Overall		first 3-4 months		last 6 months	
	total	Spaniards	as providers	as receivers	as providers	as receivers
mean	6.704	1.641	3.291	0.986	1.928	2.33
std. error	(0.154)	(0.085)	(0.100)	(0.082)	(0.096)	(0.121)

3.2. The models

Our aim is to determine the attributes and characteristics of the egos, alters, local areas, and support roles most strongly associated with the probability of a tie between an immigrant and a Spaniard. Thus, the dependent variable is dichotomous, taking the value 1 when there is a tie between an immigrant and a Spaniard and 0 when the tie is to a non-Spaniard.

Our sample is made up as follows: we select those interviewees who mentioned at least one person in their support personal network. The total number of egos in our sample is $n_e=364$, and the total number of alters is $n_a=2,462$. Since each ego provides information about his/her alters and some correlation is expected between alters (they may know each other, some can be siblings, etc.), these actors are nested within egos in a two level structure. Hence the use of traditional multivariate statistical tools, like single level logistic regression analysis, is not appropriate, as these would produce unreliable standard errors, leading to invalid inferences (Snijders and Bosker 1999). Previous work on personal networks suggests the use of multilevel modelling when the variable to be explained is related to the alter or to the tie alter-ago (van Duijn, van Busschbach et al. 1999; Vermunt and Kalmijn 2006).

We build the model via a forward selection process, using MLwiN software (Rasbash et al 2005), for which we first add level-one variables (alter), then we add the second level variables (ego) and we finish by introducing same-level and cross-level interactions, following closely the approach of van Duijn, van Busschbach and Snijders (1999) and we finally add local area contextual information. We only show the final models in the results section. We compare estimates obtained via second order penalised quaslikelihood (PQL) using the Restricted Iterative Generalised Least Squares (RIGLS) algorithm with those obtained via the Markov chain Monte Carlo (MCMC) method.

The logistic random intercept model expresses the log-odds of a tie between an immigrant and a Spaniard as a sum of a linear function of the explanatory variables and a random immigrant(ego)-dependent deviation u_{0j} :

$$p_{ij} = \text{pr}(y_{ij} = 1 \mid \mathbf{X})$$

$$\text{logit}(p_{ij}) = \beta_0 + \sum_{h=1}^r \beta_h x_{hij} + u_{0j},$$

where i is an index for level 2: the ego (immigrant), j is an index for level 1: the alter (Spaniard or non-Spaniard) for the deviations u_{0j} are assumed to have zero mean and a variance of $\sigma_{u_0}^2$.

In addition to the multilevel analysis, we use a single level ordered logit model at the ego-level to provide a different insight into our research question. With the multilevel model we can determine which explanatory variables at the ego, alter, or local area level, are associated with a greater probability of a tie between an immigrant and a Spaniard. The ordered logit model can then be used to assess which ego-level covariates are associated with a greater *overall number* of Spaniards in the ego's support network in a single (ego) level analysis. Hence the number of Spaniards in the ego's network is the dependent variable in this second modelling approach.

This ordered logit model, also known as proportional odds model, depends upon the idea of cumulative logit, or cumulative probability. We compare the probability of an equal or smaller response, $Y \leq k$, to the probability of a larger response, $Y > k$ (Hosmer and Lemeshow 2000). We define the logit for this model as:

$$c_k(x) = \ln \left[\frac{P(Y \leq k | X)}{P(Y > k | X)} \right] = \ln \left[\frac{\psi_0(X) + \psi_1(X) + \dots + \psi_k(X)}{\psi_{k+1}(X) + \psi_{k+2}(X) + \dots + \psi_K(X)} \right],$$

where $k = 0, 1, \dots, 8$, since there are 9 possible values for Y (number of Spaniards in our data goes from 0 to 8). The threshold parameters are $\alpha_1 < \alpha_2 < \dots < \alpha_8$

Given the standard logistic assumption, the response probabilities are calculated as:

$$P(Y = 0) = \frac{1}{1 + \exp(\beta X + \alpha_1)}$$

$$P(Y = 1) = \frac{1}{1 + \exp(\beta X + \alpha_2)} - \frac{1}{1 + \exp(\beta X + \alpha_1)}$$

⋮

$$P(Y = 8) = 1 - \frac{1}{1 + \exp(\beta X + \alpha_8)}$$

This ordered logistic regression model can be used to estimate the probability that an ego's predicted number of Spanish alters (the unobserved variable Y^*) lies within the various threshold limits, given ego's attributes (\mathbf{X}).

4. Results

4.1 Descriptive analysis

The presence of at least one Spanish alter is quite common in the personal support networks of the interviewed immigrants. Almost 70% of them have mentioned at least one Spaniard with whom some kind of assistance is exchanged in terms of accommodation, job search, information or material help. The number of these actors in the support network normally comprised between one and three persons (Figure 1).

Although more than two thirds of the immigrants mention that they have at least one Spaniard in their support network, we observe that the overall proportion of Spaniards in the support networks does not exceed 25% (Figure 2). So in general only one out of every four nominees is Spanish. Support interactions rely more frequently on other foreign acquaintances, among whom strong ties play the most important role (Aparicio and Tornos 2005; de Miguel-Luken, Solana et al. 2007), even if the access to resources can be -a priori- more difficult for immigrant alters than Spanish alters.

The effect of time does not show any significant difference at first glance (Figure 2 – sample b). Instead of increasing their presence over time, the percentage of Spaniards slightly decreases from the first months to the last period. Explanation can be found in the fact that Spaniards more often act as help providers instead of receivers, and ego is more susceptible when he or she first immigrates to Spain, and hence usually assumes the position of beneficiary (de Miguel-Luken, Solana et al. 2007). As the immigrant's stay in the country extends, he or she is more likely to be a support *provider*. As donator he/she can be more useful for other immigrants who are strangers in the new environment, which would explain the similarity of the Spanish presence in the support networks at the two time points. If we had inquired about companionship or friendship, the results would have most likely been different, since we expect that the longer the period of residence in the country, the more intense the contact with local people.

Figure 1: egos by presence and number of Spanish alters in their support personal networks

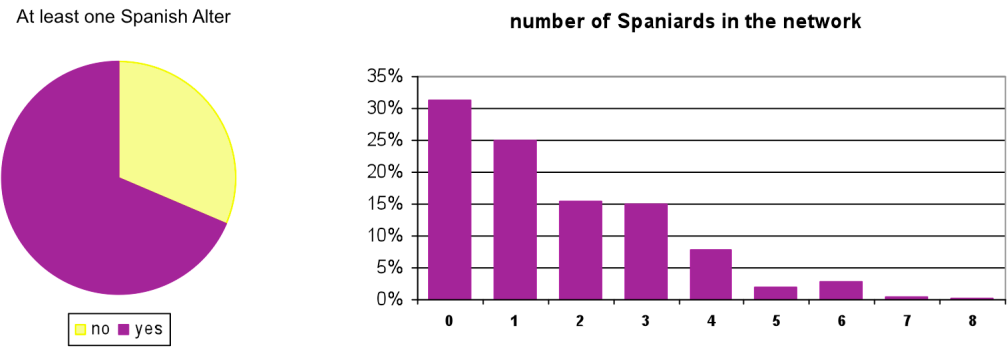


Figure 2: proportion of Spanish alters in the personal networks



As we cross-tabulate by ego’s main attributes (Table 2), we see that Spaniards are slightly more often present in the female immigrant networks, whilst age does not have a significant effect on the kind of support exchange studied here, not even showing a regular pattern as it increases or decreases. Academic level and place of birth have the expected relationships with the presence of Spaniards in the support networks: as the academic qualification level of the immigrant increases, so does the proportion of those who have nominated one or more Spaniards. Egos with longer formal education have interacted more often with Spanish population.

Immigrants from Maghreb and rest of Africa hardly ever mention any Spaniards in their networks, and, when they do they do not mention many of them.

As the educational attainment of the immigrant increases, so does the proportion that nominate one or more Spaniards (from half of the interviewed population who cannot read or write to almost 87% of those who have a university degree – Table 2). This clear pattern is also observed when we compare the mean number of Spaniards in the network, which is less than one for the first educational category and jumps to more than two for the highest class; egos with more years in formal education are more likely to interact with the Spanish population.

Table 2: Spaniards in the support personal network by ego's main attributes

Attribute (chi-square prob)	presence of Spanish alter (%)	number of Spanish alters <i>mean (std. err.)</i>
sex (<i>Pr=0.128</i>)		
male	65.31	1.434 (0.110)
female	72.67	1.878 (0.131)
age group (<i>Pr=0.262</i>)		
19-25	59.65	1.526 (0.221)
26-30	74.29	1.843 (0.208)
31-35	67.53	1.571 (0.182)
36-45	74.23	1.835 (0.173)
46+	64.18	1.328 (0.173)
place of birth (<i>Pr=0.000</i>)		
Maghreb	54.26	1.078 (0.121)
rest of Africa	60.00	1.300 (0.423)
Portugal	77.78	1.889 (0.395)
Eastern Europe	82.98	2.043 (0.245)
Rest of Europe	63.16	1.895 (0.529)
Colombia	73.68	1.868 (0.233)
Ecuador	71.88	1.609 (0.197)
rest of Latin-America	88.38	2.605 (0.264)
academic level (<i>Pr=0.005</i>)		
cannot read/write	50.00	0.800 (0.213)
can read/write-primary studies	63.16	1.383 (0.131)
secondary/technical studies	70.19	1.689 (0.132)
university	86.54	2.519 (0.237)

4.2 Multilevel models

We use multilevel models to answer our second research question: what is the relative importance of the various factors in explaining a tie between an immigrant and a Spaniard? (Table 3). According to our models, some alter attributes are over-represented among the Spaniards in the personal networks. The probability of the alter being Spanish significantly increases if the alter is older than the ego. Younger ties and people of the same age are more common in those non-Spanish members of the support network of an immigrant. However, this result may be hiding an age structure effect, since the foreign population pyramid is younger than the native one, and we have to bear in mind that only people over eighteen have been sampled, making contact with non-Spaniard older alters less likely.

Regarding gender, Spanish alters are slightly more likely to be female than male, maybe indicating the more straightforward chances of contacting them in informal or casual scenarios, such as that of the neighbourhood, school of their children, shops they frequent, etc., while male Spaniards are more likely to be known through their work environment, which is often quite segregated and restricts the real opportunities of an exchange of support.

Spaniards exchange help mostly in terms of job searching and general information about the destination^{*}, but as we compare this with the support exchanged between ego and other immigrants, we observe that the role of Spaniards is really important for material assistance. They are relatively more active as providers: goods for children, clothes, sometimes money, especially for economic immigrants.

^{*} Results not included on this paper.

Table 3: Multilevel logit models for the probability of a personal support network tie to a Spaniard.

Fixed effects	coeffic.	std. err.	coeffic.	std. err.	coeffic.	std. err.	coeffic.	std. err.
	1: RIGLS PQL 2 nd order		2: MCMC		3: RIGLS PQL 2 nd order		4: MCMC	
Intercept	0.286	(0.484)	0.319	(0.512)	-0.051	(0.549)	-0.111	(0.543)
'ALTERS' attributes- level 1 var.								
Female	0.282	(0.143)	0.290	(0.146)	0.290	(0.150)	0.298	(0.153)
alter younger than ego	-2.007	(0.206)	-2.057	(0.217)	-2.097	(0.212)	-2.154	(0.220)
alter-ego same age (+- 5 years)	-1.519	(0.162)	-1.554	(0.169)	-1.581	(0.166)	-1.617	(0.173)
alter older than ego								
<i>type of exchanged support...</i>								
... job	0.125	(0.155)	0.125	(0.158)	0.115	(0.158)	0.119	(0.163)
... accommodation	-0.580	(0.162)	-0.592	(0.165)	-0.551	(0.166)	-0.563	(0.165)
... information	-0.291	(0.152)	-0.292	(0.154)	-0.289	(0.155)	-0.287	(0.156)
... material	0.512	(0.168)	0.523	(0.170)	0.536	(0.171)	0.559	(0.176)
homogeneity in occupation	-0.935	(0.158)	-0.959	(0.160)	0.052	(0.364)	0.033	(0.383)
nuclear family	-3.195	(0.363)	-3.309	(0.357)	-3.198	(0.366)	-3.317	(0.360)
other kin	-1.457	(0.244)	-1.518	(0.248)	-1.473	(0.249)	-1.549	(0.253)
Friend								
neighbour	1.530	(0.423)	1.585	(0.442)	1.589	(0.435)	1.659	(0.449)
work colleague	2.303	(0.276)	2.380	(0.288)	2.390	(0.284)	2.489	(0.300)
Other	0.414	(0.176)	0.419	(0.180)	0.422	(0.181)	0.431	(0.186)
'EGOS' attributes – level 2 var.								
<i>place of birth</i>								
Portugal	1.768	(0.553)	1.858	(0.571)	1.634	(0.585)	1.730	(0.602)
East-Europe	0.854	(0.329)	0.872	(0.337)	0.806	(0.354)	0.862	(0.366)
rest of Europe	0.915	(0.486)	0.937	(0.501)	0.772	(0.515)	0.811	(0.536)
Maghreb								
rest of África	0.130	(0.630)	0.127	(0.656)	0.086	(0.665)	0.093	(0.686)
Colombia	0.074	(0.357)	0.063	(0.379)	-0.089	(0.400)	-0.052	(0.415)
Ecuador	0.058	(0.311)	0.063	(0.324)	-0.004	(0.334)	0.032	(0.341)
rest of Latin-America	0.931	(0.329)	0.952	(0.335)	0.841	(0.361)	0.899	(0.375)
<i>province of residence</i>								
Alicante								
Cáceres	0.857	(0.343)	0.876	(0.369)	1.090	(0.372)	1.161	(0.384)
Gerona	0.231	(0.335)	0.219	(0.357)	0.325	(0.361)	0.367	(0.379)
Huelva	0.277	(0.312)	0.269	(0.314)	0.468	(0.340)	0.507	(0.347)
La Rioja/Navarra	0.679	(0.306)	0.696	(0.319)	0.818	(0.336)	0.869	(0.350)
years of residence in Spain	0.033	(0.018)	0.033	(0.019)	0.035	(0.019)	0.037	(0.019)
no pioneer	-0.633	(0.248)	-0.669	(0.260)	-0.592	(0.260)	-0.628	(0.266)
% co-nationals in the municipality.	-0.057	(0.021)	-0.059	(0.021)	-0.060	(0.022)	-0.061	(0.022)
no previous contact with Spain	-0.680	(0.231)	-0.696	(0.246)	-0.683	(0.242)	-0.706	(0.253)
<i>Occupation</i>								
not working								
Agriculture					0.204	(0.319)	0.228	(0.337)
Construction					0.346	(0.438)	0.345	(0.453)
domestic help					0.444	(0.402)	0.463	(0.426)
hostel/restaurant					0.422	(0.416)	0.431	(0.443)
Industry					0.236	(0.564)	0.236	(0.577)
Other					0.422	(0.378)	0.430	(0.403)
CROSS-LEVEL INTERACTION VARIABLES								
not working*same occupation								
agriculture*same occupation					-1.341	(0.462)	-1.365	(0.484)
construction*same occupation					-0.607	(0.591)	-0.578	(0.605)
domestic help*same occupation					-1.791	(0.651)	-1.865	(0.685)
hostel/restaurant*same occ.					-0.918	(0.578)	-0.920	(0.609)
Industry*same occupation					-0.453	(0.806)	-0.488	(0.826)
Other*same occupation					-1.496	(0.574)	-1.533	(0.593)
Random effects	estimate	std. err.	estimate	std. err.	estimate	std. err.	estimate	std. err.
Variation between egos $\text{var}(u_{oj})$	1.277	(0.207)	1.428	(0.311)	1.438	(0.224)	1.625	(0.343)

The offer of a place to stay immediately after immigration is usually made by a co-national of the immigrant, who precedes ego in his/her experience in Spain. Even when there is not any strong family or friendship tie between the immigrant and other co-nationals already settled in the place of arrival, some weak tie, some neighbour or friend of a friend from the same origin often turns out to be relevant to provide the initial of accommodation for the new immigrant. No significant differences in the role of Spaniards and non-Spaniards are found for support linked to labour integration, meaning that the immigrant gets information about jobs or where to go to get them equally from Spaniards and other immigrants. Regarding information support, even if the gap is not so obvious, there is some evidence of a stronger interaction with other immigrants than Spaniards.

According to the contact hypothesis we would expect a prevalence of Spanish alters from the same work environment, showing that 'forced' interaction could lead to the creation of support relationships. However, job homogeneity (Table 3) indicates that the probability of a member of the personal network being Spanish actually decreases if this person shares the same occupation with ego. This result does not necessarily mean that the contact at work does not favour the formation of a supportive link between immigrant and Spaniard, but it can be basically reaffirming the well-known segregation and hierarchy that exist in the labour market with regards to nationality. Agriculture in Spain constitutes the best example; for the study period it was hard to find a Spaniard as an employee*. Thus, the lack of job homogeneity with the Spaniards could be explained by the simple fact that there are just few of them that can be reached through work, because they have a different occupation, or because they are more likely to occupy higher positions in the workplace.

We investigate this hypothesis by including the cross-level interaction 'job homogeneity*ego's occupation'. Although we do not find any statistically significant estimate for 'homogeneity of occupation' as a level two fixed covariate (Models 1 and 2, Table 3), the results for the interaction terms (Models 3 and 4, Table 3) indicate that egos working in occupations where the labour force mainly comprises immigrants are less likely to have ties to Spaniards. These occupations are 'domestic services' (taking care of older people/children, cleaning and house caring, etc.) and 'agriculture', together with 'other' category. For the respondents working in construction, restaurants, factories, professional occupations, etc., differences in ties to Spanish and non-Spanish alters are not significant. Domestic service is a special case; although Spaniards and immigrants do not carry out the same activity in this context, the job is the gateway for these immigrants (most of them women) to get to know Spaniards, increasing the probability of a immigrant-Spaniard support tie.

Around 45% of Spaniards are described as 'friends' by the egos (Miguel Luken, Solana Solana et al. 2007). However, as we compare Spanish with non-Spanish alters, we find a significant coefficient indicating that immigrants describe Spaniards more frequently as neighbours, work colleagues or others (all models, Table 3), while some sort of kin bond increases the probability of the alter being a non-Spaniard. Social migratory networks during the early days of immigration rely essentially on close or more distant relatives and, even if they may not be the best prepared to access to the different available resources, they are the people more likely to be trusted by the immigrant at the time of arrival, and the people who give and receive the basic and initial aid.

* It would be interesting, nonetheless, to examine whether this circumstance has changed in recent times and near future. Complementary labour markets in good economical conjunctures may turn into scenarios of competition and substitution processes in times of crisis.

Now that we have an idea of the typical attributes of Spaniards in the network as compared to the non-Spaniards, we turn our focus to the ego's features that help understand the presence of a host-individual in the support network.

Geographical origin counts. Despite having examined the effects of demographic variables, such as sex and age, and other variables to control for human capital, such as academic level or skills in Spanish language (all of them non-significant), we still find that place of birth is associated with differences in the network composition (as previously found in other works, for instance, Aparicio and Tornos 2005). Taking as the baseline the group of people coming from the North of Africa (mainly from Morocco), we find that the coefficients are all positive and that the probability of having named a Spanish alter is significantly higher for the Europeans and Latin-American who are not Ecuadorians or Colombians. This also concurs with results from Martínez García, García Ramírez et al. (2002) who state that Peruvian women have more ties to Spaniards than Moroccan women have.

The rest of the categories are not found significant in the models. Other Europeans from the former EU, except for Portugal, have a coefficient that is similar to that for Eastern Europe, even if the coefficient for 'rest of Europe' is not significant. People from the rest of Africa, Ecuador or Colombia do not differ much from the Maghrebi people. These results are consistent with the findings discussed in previous research on opinions and attitudes toward immigration in Spain (for instance, Calvo Buezas 2003; Gualda Caballero 2005; Moya Morales y Rodríguez -Bailón 2002, Rinken and Pérez Yruela 2007)[†], where foreigners from the European Union and rich countries, such as the United States, are better situated than foreigners from poorer countries. Maghrebi and Subsaharian immigrants, followed by Latin-Americans, are repeatedly relegated to the last positions on lists of preferences in opinion surveys about immigrants.

Our estimates suggest that prejudices are operating beyond the limits of the general discourse, and that the interactions in terms of support exchanges between immigrants and Spaniards are not the same across nationalities. It is interesting to note the advantage of Portuguese immigrants, whose more intense communication with Spaniards can be understood partially as a consequence of the traditional frontier relationship that exists between the two countries in some of the sampled geographical areas. Also, not all immigration labelled as economic has the same degree of social integration. Although there is much discussion of cultural proximity - common religion and language - between Spain and Latin-American countries, internal distances in that wide subcontinent have also been frequently argued. People from Ecuador, for instance, have dense, hermetic and very strong-tie dependent personal networks in Spain (Aparicio and Tornos 2005; de Miguel, Solana et al. 2007; Domínguez and Maya-Jariego 2008), while composition and structure are less compact and homogenised for other Latin origins. Argentineans, for instance, score the highest mean number of Spaniards in their networks, and mixed marriages are more frequent among other Latin-Americans, such as Dominicans, Cubans, etc.

Living in two provinces: Cáceres and La Rioja/Navarra seem to favour support exchange with Spaniards, as compared to Alicante. It is interesting to notice that from the five areas considered, these are the two provinces that have only recently seen significant numbers of immigrants. Apart from some early settlement in the beginning of the eighties of

[†] Some survey results can be consulted at the *Barometers* of the 'Centre for Sociological Research' (CIS) in Spain: <http://www.cis.es>

Moroccan people in Cáceres (who mostly worked in agricultural tasks), the more substantial flows to these destinations are really recent and basically labour-orientated. In Alicante, Gerona and Huelva, the so-called economical immigration coexists with the immigration from Northern European wealthy countries. British colonies, for instance, are very important in Alicante, and French presence in Gerona quite noticeable. It could be that ties to Spaniards are being replaced by ties to other foreigners in these contexts of elevated residential segregation and heterogeneous scope of nationalities.

The number of years of residence in the country has a slight positive effect on the probability of an alter being Spanish. The longer the stay, the higher this probability becomes, although, as we commented from the graphs, these relationships were more frequently originated during the first period after arrival. This outcome is also very consistent with earlier works. Lubbers, Molina et al. (2007) indicate that the percentage of Spanish in the immigrant personal networks is positively correlated to the years of residence in Spain. Maya-Jariego and Armitage (2007) also show that identification with the neighbourhood in Spain (which is affected by the ties formed within this) instead of identification with the neighbourhood in the sending country or with the expatriate compatriots' community increases as it does the number of years in the country.

We also treated this covariate as categorical. Although all the coefficients increased with the number of years in the country, the only category that was clearly significant was that for more than ten years of residence (those arriving before 1994). The growth in immigration flows to Spain has been quite concentrated in the last decade, and it could be that Spaniards were receptive to immigrants before the first real surges of immigrants in the last ten years.

Furthermore, if a person immigrates to a municipality with many other co-nationals, the possibilities of interrelating with Spaniards automatically decreases as a matter of a simple numerical calculus. Besides, if we think that they will be more willing to communicate with people in the same situation as them and with the same cultural and ethnic background, the chances of exchanging support with other immigrants will increase. This is what the covariate “% co-nationals in the same municipality”[‡] shows: the higher the proportion of foreigners from the same origin in the municipality, the lower the odds of a tie between an immigrant and a Spaniard.

The circumstance of not being a pioneer[§], i.e., of counting on someone at arrival, some sort of contact that may help with the initial stages of immigration, has a negative influence on the tie to a Spaniard, as one might expect. The reasoning behind this is similar to the previous one. If the person is not the first amongst their contacts to take the initiative to emigrate, if he/she already has some connections at the destination, the need to rely on Spanish resources diminishes. Those who did not know anyone at arrival might have had a more difficult time in the beginning, but were somehow ‘forced’ to turn to Spaniards for support, when this was required.

Moreover, if the immigrant has not had some preliminary knowledge about the country, through Spanish friends or relatives, or through holidays, work visits, etc. (“no previous

[‡] Some nationalities had to be aggregated for the creation of this variable. We calculated the percentages for the 2004 population figures. We are conscious that it would have been better if the year of reference had been different for each ego, depending on the year of his/her arrival, but we could not get all the necessary information at a municipal level to be able to calculate it that way.

[§] ‘No pioneer’ (as we have called the covariate) means, thus, that the person had someone at destination who arrived before him/her and was known beforehand (i.e. not in Spain, but at origin or another country).

contact with Spain”), then this new context will of course be less familiar. If some contact has existed before the ‘definitive’ emigration, Spaniards could actually be part of the individual friendship/acquaintances network even before immigration, becoming actors in the support network after the immigration. But even if no links has been built between the immigrant and some Spaniards prior to his movement, the experience already learnt about the society and environment of destination may have facilitated the creation of these links to Spaniards. This is what the significant negative estimate for this explanatory variable at second level tells us.

Results do not change much with regards to the method of estimation used to obtain the model coefficients. MCMC coefficients and standard errors are systematically slightly bigger (in absolute values) than PQL 2nd order estimates, although the ranking according to the magnitude of the explanatory variables and their significances remain the same for both methods. Bayesian Deviance Information Criterion (DIC), as provided by MIWin, shows some little improvement from first model to second model (2 and 4 in table 3: from 1878.99 to 1875.99).

4.3. *Ordered logistic regression models*

In addition to the multilevel analyses, we investigate associations that are not based on the existence of a tie between an immigrant and a Spaniard, but rather on the total number of the ties in the network that are to Spaniards. In order to answer this question, we run a single level ordered logistic regression model for this new dependent variable: ‘number of Spaniards in the network’ (Table 4).

As we initially postulated, we find that the higher the ego’s academic level, the higher the expected number of Spanish alters in their network (Table 4). Whether this is because of their better skills to form bridges, or because of their privileged situation to break the barriers of prejudices could only be ascertained by further research. Also related with the latter suggestion, better educational background may be often associated to better economical situation, which could be associated with less segregation to some extent and lead to more relationships with Spaniards.

Although legal status was not significant in the multilevel analysis, it is a significant factor when assessing the *number* of Spaniards in the support network. The fact that ‘irregular situation’ has a negative coefficient which is closer to zero than the negative coefficient for ‘residence permit’ (Table 4), indicating that the worst legal status condition does is not associated with the lowest probability of a tie between an immigrant ego and a Spaniard alter. This can be explained by the fact that a relevant proportion of the immigrants with a residence permit are spouses of former immigrants who, especially for some origins settled in rural contexts (as Moroccan females living in the countryside or in very small villages), basically just mentioned their husbands in the network.

Table 4: Ordered logistic model for the number of Spaniards in the support personal network

Covariates	coeffic.	odds ratio	P> z
Female	0.674	1.961	(0.002)
<i>place of birth</i>			
Portugal	1.346	3.844	(0.006)
East-Europe	0.825	2.282	(0.023)
rest of Europe	0.519	1.681	(0.341)
Maghreb			
rest of África	0.582	1.790	(0.323)
Colombia	0.433	1.542	(0.238)
Ecuador	0.256	1.292	(0.410)
rest of Latin-America	1.306	3.691	(0.000)
academic level	0.153	1.166	(0.080)
total number of alters in the network	0.320	1.377	(0.000)
no pioneer	-0.605	0.546	(0.022)
% foreigners in the municipality.	-0.015	0.985	(0.060)
<i>legal status</i>			
EU citizens/work and residence permit			
residence permit	-0.767	0.464	(0.042)
irregular legal situation	-0.579	0.561	(0.023)
cut1	1.462		
cut2	2.804		
cut3	3.691		
cut4	4.877		
cut5	6.013		
cut6	6.508		
cut7	8.069		
cut8	9.175		

This negative effect is compensated, however, by the positive estimator for ‘female ego’. Women immigrants tend to mention more Spaniards in their networks than men, which may be explained by the less reluctant and distrustful approach of locals to non-Spaniard females.

5. Discussion

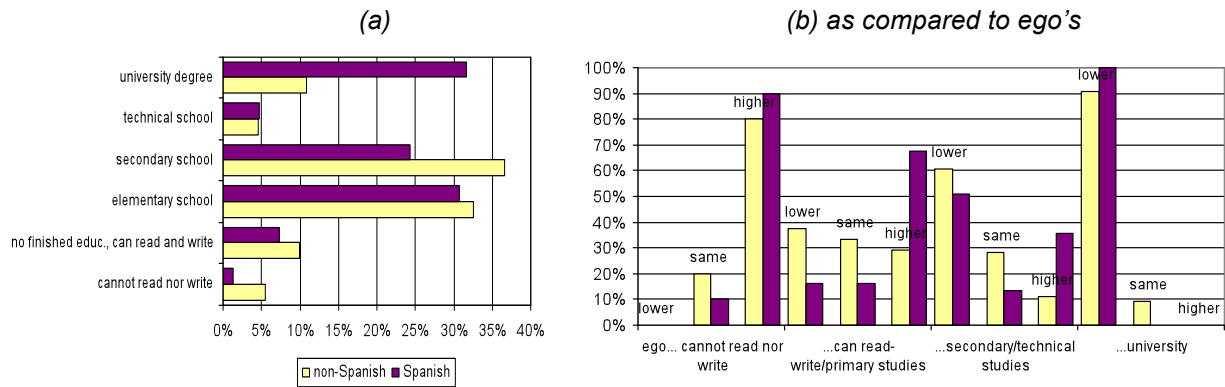
We have already found some ego and alter attributes that are significant when modelling the probability of a tie between an immigrant and a Spaniard. However, going back to our initial expectations about homophily, we have not found any evidence to confirm strong associations between homophily of alter and ego, and the likelihood of a tie being from an immigrant to a Spaniard, as opposed to non-Spaniard. On the contrary, there is no significant coefficient for gender homogeneity and Spanish alters are more likely to be older than egos. An age-structure effect, as suggested above, may be influencing this result, since the age distribution of the native Spanish population includes a much greater proportion of older people than that for the immigrants.

Furthermore, regarding our hypothesis at level one (alter's characteristics / ego-alter similarities), the model estimates do not support our supposition that males and younger people should be over-represented among Spanish, due to their more positive view of the immigration phenomenon as found in previous research. The highlighted presence of females among Spanish alters as compared to non-Spanish in our models may be due to the masculinisation of certain foreign collectives (such as Moroccan and other African immigrants), that makes exchange with female immigrants more improbable. It could be also because of the different contexts of communication in which males and females develop their daily lives, that makes more effective or stimulates the contact with Spaniard women (for instance, the interactions produced in the neighbourhood).

On the other hand, we have not added a covariate on alter's educational attainment to the models because of the high proportion of missing values. Many interviewed people were not able to answer this question precisely, and normally the bias for this non-response was quite clear. However, if we have a look at those cases for which we do know educational attainment, we observe the tendency we expect (Figure 3). The percentage of Spanish alters who have a university degree (31.7%) is much higher than the percentage of immigrants with the same academic level (10.8%). Also, non-Spanish are more represented in the lowest categories (graph 3 (a)). These data do not agree with the official figures for the total population in Spain. According to 2001 Census (www.ine.es), people born in Africa are the only group with generally lower educational levels. All other nationalities have higher proportions for secondary and tertiary degrees, so we cannot presume, as we did for age, that population socio-demographic structure may be altering the effect.

If the interviewee could not reply accurately, we then asked whether he/she knew if the alter had approximately the same educational level as his/hers, or whether this was lower or higher. The results are shown in figure 3(b). Spaniards were more often categorised as having a higher formal education than that of the respondent. Differences between Spaniards and non-Spaniards are less distinct for those egos who cannot read or write than for those egos with a university degree, who were at the opposite extreme for obvious reasons.

Figure 3. Alter's educational attainment



There are two possible explanations for the figures: 1) these concur with the general finding of previous research whereby better educated Spaniards are more likely to 'accept' immigrants, and 2) that those better educated Spaniards tend to have easier access to resources and are consequently better positioned to provide support.

Regarding ego's attributes discussed in our hypotheses, coefficients for geographical origin (Table 3) concur with our expectations; people from Maghreb are the least likely to have mentioned a Spaniard in their personal support networks. However, distinction should be made among the different Latin-American nationalities. Ecuadorians do not have the same networks and do not interact in the same way with the local population as, for instance, Argentinean or Cuban immigrants. Further research is needed to delve more deeply into these internal divergences.

We have commented previously that prior knowledge about the country positively affects the probability of a tie to a Spaniard. Nonetheless, human capital as measured in terms of ego's formal educational level and language skills does not explain much of our dependent variable. The coefficient estimates for these covariates are non-significant.

Finally, our finding for covariates evoking the social context of reception: being or not being a pioneer, the percentage of immigrants of the same origin and years of residence in Spain (Table 3), meet with our expectations: those who did not know anyone at arrival, did not chose a destination where they could meet many co-nationals, or have had a longer experience in the destination country are more prone to have exchanged some of support with a Spaniard. Even if first adaptation could have been more difficult for these 'lonely or less accompanied' newcomers, integration in the local society may have been more successful, somehow keeping them away from the risks of immersion in encapsulated ethnic communities.

6. Conclusions

Social network composition is found to be important when assessing the degree of adaptation of immigrants to the new milieu in Spain. The number of Spaniards or, at least, the presence of Spaniards in the support network has a positive effect on the immigrant's ecological transition and social integration. The use of multilevel modelling has allowed us to assess in detail which factors at ego and alter levels are most important in predicting ties between immigrants and Spaniards.

Berry (1997) affirms that relationships with members of both cultures - the one the individual comes from and the one at destination - best predict a successful adaptation. In this respect, we have found evidence of the existence of barriers that impede to some extent the equalitarian immersion of all the immigrants to the local population of Spaniards. The most important factor is the immigrant's geographical origin.

At the ego level, after controlling for time of residence, prior contact with the country, the fact of being or not being a pioneer of the migratory chain, the place of residence, the occupation and the legal situation, differences according place of birth still persist. We note the striking parallelism of our results with those found in opinion polls, where the extent of prejudices among Spaniards towards immigrants depend to some extent on the immigrant's characteristics, making the reception context more hostile (or more friendly) to some than it is to others.

Further research needs to be undertaken in order to answer some of the research questions in more depth. Findings from other surveys about immigrant's personal networks would be very welcome. It would be very interesting if these focused on some specific nationalities (for instance, in order to study the differences in the Latin-American origins), and on other types of support exchanges, which are also really important for the well-being of the new population, such as companionship or friendship. A detailed longitudinal study of the composition and role of immigrant support networks over time is also likely to have considerable research value.

References

- APARICIO, R. and A. TORNOS (2005). *Las redes sociales de los inmigrantes extranjeros en España*. Madrid: Ministerio de Trabajo y Asuntos Sociales.
- ABAD MONTES, F. and M. VARGAS JIMÉNEZ (2004). *Una aproximación Social Network al estudio de la movilidad social: Análisis de una tabla de migración*. IX Congreso de Población Española, Granada.
- BATES, T. (1994). "Social Resources Generated by Group Support Networks May Not Be Beneficial to Asian Immigrant-Owned Small Businesses." *Social Forces* 72(3), 671-689.
- BERRY, J. W. (1997). "Immigration, acculturation, and adaptation." *Applied Psychology: An International Review* 46(1), 5-38.
- BURT, R. S. (1984). "Network Items and the General Social Survey." *Social Networks*(6), 293-339.
- CALVO BUEZAS, T. (2003). *Juventud e Interculturalidad: los jóvenes españoles ante otros pueblos y culturas*. Sevilla: Fundación Centro de Estudios Andaluces.
- DOMÍNGUEZ, S. and I. MAYA JARIEGO (2008). "Acculturation of Host Individuals: Immigrants and Personal Networks". *American Journal of Community Psychology*, 42, 309-327.
- DUIJN, M. A. J. Van; J. T. van BUSSCHBACH, et al. (1999). "Multilevel analysis of personal networks as dependent variables." *Social Networks*(21), 187-209.
- FEDERICO DE LA RÚA, A. de (2003), *Réseaux d'identification à l'Europe. Amitiés et identités d'étudiants européens [Redes de identificación con Europa. Amistad e identidades de estudiantes europeos]*. Doctoral thesis in Sociology, Université de Lille 1 and Universidad Pública de Navarra.
- FISCHER, C. S. (1982). *To Dwell Among Friends*. Chicago: The University of Chicago Press.
- FLAP, H., T.A.B. SNIJDERS, B. VÖLKER and M. VAN DER GAAG (1999-2003), *Measurement instruments for social capital of individuals*. Unpublished paper. Retrieved 1 June 2006 from: www.xs4all.nl/~gaag/work
- GAAG, M. van der, and T. SNIJDERS (2003). "Proposals for the measurement of individual social capital". In: H. FLAP and B. VOLKER. *Creation and Returns of Social Capital*. London: Routledge, 199-218.
- GAAG, M.P.J. van der; SNIJDERS, T.A.B.; FLAP, H.D. (2006). "Position Generator measures and their relationship to other social capital measures". In: Lin, N. and Erickson, B. (eds.) *Social capital: advances in research*. Paper presented at the XXIII Sunbelt international Social Networks Conference; february 12-16, Cancún, Mexico

GUALDA CABALLERO, E. (2005). "Capital social, ciudadanía e integración social desde la perspectiva de las actitudes hacia la población extranjera". En: J. ANDREU. *Capital social en Andalucía*. Madrid: Biblioteca Nueva.

GRANOVETTER, M. «The Strength of Weak Ties. A Network Theory Revisited». En P. V. MARSDEN Y N. LIN. *Social Structure and Network Analysis*. California: Sage Publications, 1982: 105-130.

GURAK, D. T. and F. CACES (1992). "Migration networks and the shaping of migration systems". In: M. M. KRITZ, M. M.; L. L. LIM and H. ZLOTNIK (eds). *International migration systems: a global approach*. Oxford: Clarendon Press, pp. 150-76.

HOSMER, D., W. and S. LEMESHOW (2000). *Applied Logistic Regression*. New York: John Wiley & Sons, Inc.

LAUMANN, E. O. (1973). *Bonds of pluralism: The form and substance of urban social networks*. New York: Wiley.

LOUCH, H. «Personal network integration: transitivity and homophily in strong-ties relations». *Social Networks* 22, 2000: 45-64.

LUBBERS, M. J., J. L. MOLINA, et al. (2007). "Personal Networks and Ethnic Identifications: The Case of Migrants in Spain." *International Sociology*(22), 721-741.

MARSDEN, P. V. «Homogeneity in confiding relations». *Social Networks* V10(1), 1988: 57-76.

MARSDEN, P. V. (2003). "Interviewer effects in measuring network size using a single name generator." *Social Networks*(25), 1-16.

MARTÍNEZ GARCÍA, M. F., M. GARCÍA RAMÍREZ, et al. (2002). "Social support and locus of control as predictors of psychological well-being in Moroccan and Peruvian immigrant women in Spain." *International Journal of Intercultural Relations*(26), 287-310.

MASSEY, D. S., J. ARANGO, et al. (1993). "Theories of International Migration: A Review and Appraisal." *Population and Development Review*(3), 431-466.

MAYA JARIEGO, I. (2004). "La formación de comunidades de inmigrantes: desplazamiento en cadena y contexto de recepción." *Araucaria. Revista Iberoamericana de Filosofía, Política y Humanidades*(12).

MAYA-JARIEGO, I. and N. ARMITAGE (2007). "Multiple Senses of Community in Migration and Commuting. The Interplay between Time, Space and Relations." *International Sociology* 22(6), 743-766.

MCPHERSON, J. M., L. SMITH-LOVIN ET AL. «Birds of a feather: homophily in social networks». *Annual Review of Sociology* V17(1), 2001: 415-438.

MIGUEL LUKEN, V. de and C. CARVAJAL GUTIÉRREZ (2007). "Percepción de la inmigración y relaciones de amistad con los extranjeros en los institutos." *Migraciones*(22), 147-190.

- MIGUEL LUKEN, V. de, M. SOLANA SOLANA, À. PASCUAL DE SANS (2007). *Redes sociales de apoyo. La inserción de la población extranjera*. Bilbao: Fundación BBVA.
- MIGUEL, V. de and M. TRANMER (2008). 'A multilevel analysis of the personal networks of immigrants to Spain', *5th conference on Applications of Social Network Analysis*, Zurich 12-13th September. <http://www.asna.ch/asna/abstracts.php>
- MOLINA, J. L. (2007). "The Development of Social Network Analysis in the Spanish-Speaking World: A Spanish Chronicle, version 2b, J.L. Molina (2006)". *Social Networks*, 29 (2), pp. 324-329.
- MOYA MORALES, M. y R. RODRÍGUEZ -BAILÓN (2002). "Valores, estereotipos y prejuicio hacia los inmigrantes". En: F. J. GARCÍA CASTAÑO and C. MURIEL LÓPEZ. *La inmigración en España: contextos y alternativas. Actas del III Congreso sobre la Inmigración en España*. Granada: Laboratorio de Estudios Interculturales. II, 169-180.
- PALLONI, A., D. S. MASSEY, et al. (2001). "Social Capital and International Migration: A Test Using Information on Family Networks" *American Journal of Sociology* 106(5), 1262-1298.
- PORTES A., 1998: "Social capital: Its origins and applications in modern sociology". *Annual Review of Sociology*, 24, pp.1-24.
- PORTES, A. and J. BÖRÖCZ (1989). "Contemporary Immigration: Theoretical Perspectives On Its Determinants And Modes Of Incorporation." *International Migration Review* 23(3), 606-630.
- PORTES, A. and J. SENSENBRENNER (1993). "Embeddedness and Immigration: Notes on the Social Determinants of Economic Action." *American Journal of Sociology* 98(6), 1320-50.
- RASBASH, J., CHARLTON, C., BROWNE, W.J., HEALY, M. AND CAMERON, B. (2005) MLwiN Version 2.02. Centre for Multilevel Modelling, University of Bristol.
- REQUENA SANTOS, F. (1996). *Redes sociales y cuestionarios*. Madrid: CIS.
- RINKEN, S. and PÉREZ YRUELA, M. (2007). *Opiniones y actitudes de la población andaluza ante la inmigración*. Sevilla: Junta de Andalucía, Consejería de Gobernación.
- SHAH, N. M. E I. MENON. «Chain Migration Through the Social Network: Experience of Labour Migrants in Kuwait». *International Migration* V37(2), 1999: 361-382.
- SNIJDERS, T., M. SPREEN, et al. (1995). "The Use of Multilevel Modeling for Analysing Personal Networks: Networks of Cocaine Users in an Urban Area." *Journal of Quantitative Anthropology*(5), 85-105.
- SNIJDERS, T. A. B. and R. J. BOSKER (1999). *Multilevel Analysis. An introduction to basic and advanced multilevel modelling*. London: SAGE Publications Inc.
- STRAITS, B. C. (2000). "Ego's important discussants or significant people: an experiment in varying the wording of personal network name generators." *Social Networks*(22), 123-140.

VERMUNT, J. K. and M. KALMIJN (2006). "Random Effects Models for Personal Networks. An Application to Marital Status Homogeneity." *Methodology* 2(1), 34-41.

VÖLKER, B. (1995). *Should Auld Acquaintance Be Forgot...? Institutions of communism, the transition to capitalism and personal networks: the case of East Germany*. Amsterdam: Thesis Publishers.

WELLMAN, B. and K. FRANK (2001). "Network Capital in a Multi-level World: Getting Support from Personal Communities". In: N. LIN, K. COOK y R. S. BURT. *Social Capital: Theory and Research*. Chicago: Aldine De Gruyter.

WELLMAN, B. y S. WORTLEY. «Different Strokes from Different Folks: Community Ties and Social Support». *American Journal of Sociology* 96(3), 1990: 558-588.