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## From Statistical to Geolinguistic Data: Mapping and Measuring Linguistic Diversity

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**From Statistical to Geolinguistic  
Data: Mapping and Measuring  
Linguistic Diversity**

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# From statistical to Geolinguistic Data: Mapping and Measuring Linguistic Diversity

## Summary

The aim of this paper is describing a new methodology for mapping and measuring linguistic diversity in a territory.

The three methods that have been created by the Centro di eccellenza della ricerca *Osservatorio linguistico permanente dell'italiano diffuso fra stranieri e delle lingue immigrate in Italia* at the Università per Stranieri di Siena are the following:

- the *Toscane favelle* model, a procedural application which passes from quantitative statistical data to a demolinguistic paradigm;
- the *Monterotondo-Mentana* model. The surveys of quantitative and qualitative data are carried out using traditional tools (questionnaires, audio and video recordings) as well as advanced technologies;
- the *Esquilino* model. Digital maps are created which present the distribution of the immigrant languages through the presence of signs in linguistic landscape.

The final objective is putting together the data surveyed by the three methods in order to have a “speaking” territory, in which each point surveyed identifies the languages spoken and the various linguistic manifestations.

**Keywords:** Language Contact, Linguistic Diversity, Immigrant Languages, Geolinguistic Data, New Methodologies in Sociolinguistic Research

**JEL Classification:** I28

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## 1. Objectives

This paper aims to describe the characteristics of one of the lines of research established at the Centre of Excellence for Research *Permanent Linguistic Observatory of the Italian Language among Foreigners and of Immigrant Languages in Italy* at the University for Foreigners in Siena. The aim of this research, entitled *Lingue immigrate in Italia* (Immigrant languages in Italy), is to understand certain changes in Italy's current linguistic situation that show innovative traits relative to the traditional evolutionary processes typical of the country's linguistic composition, revitalising the linguistic diversity that has always been one of its structural features.

## 2. Current situation and working hypothesis

Our considerations are centred around the key concept of *plurilingualism*, which has always been a dominant feature in Italy's linguistic makeup. In recent decades the Italian linguistic repertoire has undergone profound change, in which (be it radical or evolutionary) the central phenomena have been the trend towards linguistic unification and the decline of dialects. We do not wish to go over the linguistic dynamics seen in the past 150 years in Italy, through processes of settlement, sedentarisation and diffusion of a unitary language in common, everyday use. However, we should bear in mind that the Italian language, following political, social, economic and cultural changes, has become the language spoken throughout the length and breadth of the country (De Mauro, 1963; De Mauro *et al.*, 1993).

The undeniable trend towards the conquest of Italian by the vast majority of Italians led, at the same time, to a progressive erosion in the use of dialects, which, whilst remaining available as a resource within the individual and collective linguistic repertoire, have undergone a gradual reduction in the range of possible uses. It is, however, worth emphasising that this process took place in a variety of ways, differentiated by social class/level, age category, cultural level, geographic area, domains and contexts of use, etc., but linguistic unification appears to grow continuously stronger.

Within this linguistic configuration, which is composite, but tends increasingly towards unification, a new factor has entered the scene: the languages that, in the past thirty years, have been and continue to be brought by immigrants to Italy, and which are emerging as a new element added to Italy's traditional plurilingualism, revitalising the plurilingual character of Italian society's idiomatic identity (Vedovelli *et al.*, currently in press).

We believe that we can now start to talk about the coexistence of an ‘old’ and a ‘new’ plurilingualism. Indeed, within Italy we see the coexistence of Italian, the language acquired, and by now spoken by almost the entire Italian population, and its varieties; dialects; the minority languages of centuries-old settlements; the foreign languages used as languages for international communication and/or learnt languages. But we cannot ignore the presence of the ‘new’ languages that are part of the linguistic repertoire of immigrants – to be considered as a new minority linguistic group – and which, following the arrival of these immigrants in Italy, have to some extent become a part of the linguistic makeup. To this is also added the Italian learnt by immigrants, interlinguistic varieties which, in the wake of Vedovelli, 2005, we will call *contact Italian*, in the sense that it is an “identity-creation tool, the source of a new and original form of expression that deviates from the prescriptive rigidity of the languages” (ibid.: 28).

The hypothesis that we wish to test, using a model capable of encompassing the subject and acquiring significant data, is that the languages of the immigrant groups may constitute a factor that restores space and vitality to Italy’s plurilingualism, injecting traits of new plurilingualism.

The few studies carried out on these topics estimate that to date at least 130 new languages have entered Italy (Vedovelli, Villarini, 2001), a considerable number of languages that feature daily to some extent in the social interaction networks of the Italian linguistic repertoire. Indeed, recent data (Caritas, 2005) tell us that one of the factors that has always marked migratory presence is ethnic polycentrism, seen throughout the Italian peninsula, and, consequently, linguistic polycentrism.

To test the hypothesis that the languages of the immigrant groups, considered as a new element in Italian plurilingualism, may constitute a factor that restores space and vitality to it, we first need to outline a theoretical model capable of defining “the conditions that make interaction possible between new plurilingualism and the pre-existing linguistic makeup on a local and national scale, with all its different gradients in terms of socio-cultural characteristics” (Vedovelli, currently in press).

This model must be capable of taking into account factors concerning the languages of the migrant groups, investigating their level of maintenance or loss in the uses of their speakers, to differing degrees according to generation, types and networks of use, their capacity to exert pressure on the local linguistic repertoire and the creation of new forms deriving from contact and linguistic assimilation; but also the attitudes and behaviour, both of the local community, in terms of the pressure it exerts on migrant groups and on new languages, and of the migrants themselves towards Italian, a language that is necessary for mutual comprehension, and a symbolic tool for integration.

## 2.1 Migrant languages, immigrant languages

The line followed by our research into the Italian linguistic repertoire as a point of contact between old and new linguistic entities aims primarily to describe the signs or traces of change, and to measure the new use of alloglot languages in relation to the dynamics typical of the phenomenon.

In this regard, we consider it to be fundamental to use the classification proposed by Bagna, Marchetti, Vedovelli (2003), which distinguishes the concept of *migrant language* from that of *immigrant language*, in order to understand the nature and effects of the interaction between the new plurilingualism and the local linguistic repertoire. We refer first of all to the capacity for and level of putting down roots within a local community: numeric ratios, level of integration, migratory mobility, autonomous vitality of the migrant group, pressure from the community, etc.

*Migrant languages* are languages “passing through”, used by migrant groups who drift around the social territory, non-cohesive and in relatively small numbers, and for this reason these languages are unable to put down roots and leave traces of their presence in the linguistic contact makeup with the host community, or succeed in doing so only sporadically. *Immigrant languages*, on the other hand, are those of numerically larger, stable groups, with intentions of putting down roots within a local community; languages that are used systematically by the immigrant group and that are able to “leave their mark” in the linguistic contact makeup with the host community. Only the latter can hope to become a part of the new plurilingualism of the Italian peninsula and, given that they are in a more stable and lasting situation of contact with the other varieties present in the area, they are in a position to affect its communicative and linguistic makeup. Statistical data on immigration in Italy (Caritas, 2004, 2005) confirm year after year a strong drive to take roots. Still to be evaluated, in regards to the communicative characteristics of the individual groups within their specific local communities, is the linguistic result of this rootedness: the degree of adherence to their language of origin; their ability to exhibit socially the linguistic usages of their homeland; the strength of negotiation on a social and institutional level (especially in schools) regarding the integration and acceptance of the language of origin within the local community; the level of cultural and social cohesion, and also linguistic cohesion, of this community.

### 3. *The methodological model*

The complexity of the research topic led the Centre of excellence to construct a methodological model based on a multidimensional approach.

The main feature of the procedure adopted is a multi-methodological approach of the “triangulation” type, enabling us to collect both qualitative and quantitative data on the subject, obtained through various points of reference. The approach is also multidisciplinary, integrating concepts,

methodologies and tools typical of research in the linguistic sciences with those of geographical, social and statistical sciences and IT. Using different methodologies and tools it is in fact possible to produce geolinguistic mapping of the peninsula's new plurilingualism, with particular regards to the migratory context, and to give a graphic representation of the sociolinguistic dynamics running through it using geolinguistic maps. By linking the "triangulated data", the mapping enables us to portray the new profiles of the linguistic contact makeups in the various migratory contexts (large urban areas and specific zones within them; small and medium-sized centres; isolated areas). The intention is to form a schema of the languages in contact and of their relations in terms of quality and quantity, with a coherence arising from the identification of the forces underlying the phenomena and their reciprocal interactions. From this perspective methodological options emerge regarding data collection and processing practices, as do lines of analysis performed according to models that are highly innovative and significant, also in applicative terms.

The observation parameters we adopted for monitoring linguistic changes within a given territory regard the presence of speakers of immigrant languages, their demographic weight and their location (areas of residence, neighbourhoods); their statements regarding use, attitudes and linguistic skills, and the behaviour and attitudes of natives; the presence, visibility and actual use of the languages in social interaction contexts.

The degree of penetration of the languages in the area is thus measured in terms of

- presence of the languages;
- declared vitality;
- visibility/interaction/use.

For each of these three observation parameters a different data-collection model was designed. These are, respectively, *Toscane favelle* (TS), *Monterotondo-Mentana* (MM) and *Esquilino* (ES), so named according to the places of reference where they were first applied and tried.

Each of the three models entails geolinguistic mapping of the area: potential (from nationality to language) in the first, perceived or self-declared (by the contact actors) in the second, actual usage (based on direct observation) in the third. When compared, the mappings produced by the three data collection models, enable us to draw the different linguistic contact scenarios that can take place in the various migratory contexts, and to identify the parameters and factors that can combine to affect their configuration.

### 3.1 The three models of investigation

The first investigation model, called *Toscane Favella (TF)*, aims to give graphic representation of the languages present, the number of speakers, and their level of aggregation within an area, using thematic maps. The input data are statistical data on the presence of foreigners, regarding nationality, numbers and sedentariness, all easily obtained from public institutions. These data are transformed into data on the languages potentially present, using existing classifications regarding the languages spoken in the immigrants' countries of origin (Grimes, 2000; Katzner, 1995-2002) and then represented in graphic form as geolinguistic maps (Baker and Eversley, 2000)<sup>1</sup>. Using this procedure, the demographic weight of a community is revealed, in terms of both quantity and quality (numerousness – sedentariness and aggregation), and, when considered from a linguistic point of view, it becomes a necessary requisite in order for the language spoken by that community to be considered an *immigrant language*. Only if it bears demographic weight in a given territory can a group hope to bear sociolinguistic weight too (Bagna, Barni, Siebetcheu, 2004). However, since a group's demolinguistic weight within an area is a necessary requisite, but not sufficient for the maintenance and vitality of their language, this model alone will not suffice to explain the complex dynamics of linguistic contact described above. It is nonetheless a relatively simple procedure to use in order to gain an initial, if not well-defined, idea of the potential degree of plurilingualism within an area: its results could be useful to local bodies, schools, etc., in planning linguistic policy in the area.

The second model of analysis – the *Monterotondo-Mentana (MM)* – involves using questionnaires or audio/video-recorded interview protocols to collect data on the speakers' self-declarations about uses and contact with languages, on their use in the various social contexts (family, public, school, work), on attitudes and perceptions towards them, both those of Italians and those of foreigners (see Bagna, Barni, 2005b; Bagna, Pallassini, currently in press). This approach blends the procedures and the processing of results seen in the models of Baker and Eversley (2001) and of the Multilingual Cities Project (see Extra, Yağmur, 2004). As well as quantitative data on the languages present and used, and their representation in map form, this procedure also provides qualitative data regarding linguistic practices in different situations and contexts, and thus on the degree of maintenance and vitality of a language (see Extra, Yağmur, 2004).

The third model – *Esquilino (ES)* – aims to survey the presence and uses of languages in contexts of social interaction. This model combines three different dimensions:

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<sup>1</sup> We should stress that the paradigm used to convert demographic data into linguistic data is not produced mechanically by counting the total number of speakers of a language based on the inhabitants of the nation in question, but by projecting the linguistic data obtained from the abovementioned classification lists onto the number of inhabitants.



- the ‘static’ visibility and vitality of languages, i.e., seen in texts for public communication;
- the ‘within interactions’ visibility and vitality of languages, i.e., seen in linguistic uses in interactive exchanges between speakers;
- the ‘aggregate’ visibility and vitality of languages, i.e., seen in linguistic usage in particular places of social contact.

The data-collection tools used (digital cameras and video cameras, hand-held computers) record the forms of contact (written texts or interactions) and the ways in which these are structured according to the type of territory in question (small or medium urban areas; non-urban areas). All the data collected are georeferenced, i.e., associated directly to the territorial location when collected, and permanently linked, using geographic softwares (Bagna, Barni, 2005a).

The ‘static’ visibility and vitality of languages is measured by observing the traces of presence of the immigrant languages within the social communication space. Photographs are taken of all the written traces that contribute to form the so-called ‘linguistic landscape’ (Landry and Bourhis, 1997): public announcements – work-related and personal, posters and publicity, business cards, shop signs, information signboards, menus, writing on vehicles, etc. The conformation of the *linguistic landscape* is assumed to be a contributing factor in describing the linguistic usages characteristic of a given territory. According to Landry and Bourhis (ibid.: 29), the two academics who first formalised the study of this aspect of linguistic makeup, “the linguistic landscape may act as the most observable and immediate index of the relative power and status of the linguistic communities inhabiting a given territory”.

Underlying the above statement are the informative and symbolic functions that the linguistic makeup and its conformation can perform in multiethnic, and thus multilingual, areas (Landry and Bourhis, 1997: 25-29)<sup>2</sup>.

The informative function of the linguistic landscape is determined by its capacity to signal the presence of a specific linguistic community within its territory, to represent the sociolinguistic composition of the linguistic groups present, and to indicate the languages that may be used there. The way in which the linguistic landscape is structured also provides information regarding the power and status attained by the languages involved.

The symbolic function of the linguistic landscape relates to the fact that language is the most important dimension of ethnic identity: the presence and visibility of a language thus indicates a positive

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<sup>2</sup> It should be emphasised that the two authors are referring to historically multiethnic, and thus multilingual areas. The presence of texts in languages other than the local language, such as shop signs in English (or, to a lesser degree, in French) in Italian cities, or in Italian outside Italy, may also have a different function, evoking an identificatory model (Vedovelli, 2006 for Italian; Ross, 1997, Ben-Rafael *et al.*, 2006, Huebner, 2006 for English).

attitude on the part of ethno-linguistic groups towards their identity of origin. Furthermore, as regards this function, the linguistic landscape can also be linked to the concept of “ethno-linguistic vitality” (Giles *et al.*, 1977): the use of a language for social communication is a sign of its level of vitality, and therefore represents one of the factors contributing to its maintenance<sup>3</sup>.

Alongside the analysis of the linguistic makeup in a given territory, there is a second investigative dimension, regarding the visibility of groups and the vitality of languages ‘in interaction’. This entails the recording of interactions involving contact subjects during communicative events. Here what is being observed is actual uses in social communication contexts (in the street, on the bus, at the bar, etc.) between speakers of the same language or of different languages, or who use a linguistic repertoire that may range from the language of origin to Italian or other languages used as a *lingua franca*, in order to observe the ways and types of linguistic contact, code mixing or switching.

The third investigative dimension, which seeks to highlight the visibility of groups and the ‘aggregate’ vitality of languages, is used for research in environments ‘closed’ by physical boundaries or other factors (schools, marketplaces, apartment blocks, slums, circumscribed areas within a neighbourhood or city, etc.). In this third dimension the crux of the investigation is the place in which different linguistic behaviour patterns can be seen, in that the researcher records the way in which the same communicative event, in the same location (e.g., buying goods at a market stall), changes as the actors involved in the interaction change.

As we have mentioned, for all the models and dimensions described above, the Siena Centre of Excellence’s innovation in researching immigrant languages lies in the added contribution of geographical and computer sciences. All the data (be they statistical, or gathered using questionnaires or through direct observation) are recorded directly in digital form and/or transferred to databases and classified on the basis of various parameters, according to the type of data. They are then processed by computer in order to produce maps of the territory in question. Using this procedure it is possible both to gather and store vast quantities of data and to produce thematic maps (showing the languages potentially present within the area, the declarations of language use, the languages observed in social communication texts, and linguistic uses in interactions).

The result obtained after application of these models is a multiple-level survey of the territory, making use of various factors that help identify the presence of immigrant languages through statistical data, their vitality through declared usages in familiar communication contexts, and their visibility

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<sup>3</sup> Recent research by Barker and Giles (2002) also highlighted the fact that the conformation of the linguistic landscape contributes to modifying native attitudes towards other communities present within a given territory: a greater degree of plurilingualism within the social communication space, corresponds to less hostile native attitudes and less fear of others on the part of natives.

through the observation of their traces and of their use in contexts of social communication, and their strength, focusing on the linguistic outcome of the contact.

Georeferencing also means that data can be analysed both *synchronically* and *diachronically*: synchronically in that it allows us to compare different portions of data and territory ‘surveyed’ in a homogeneous survey campaign; diachronically because data gathered in a single geographical location on different occasions some time apart can be superimposed in order to create maps that highlight the changes in the linguistic repertoire within that territory.

#### *4. Linguistic contact makeup in a migratory context: the case of the Esquilino neighbourhood in Rome*

The city of Rome, and specifically its most conspicuously multiethnic neighbourhood, l’Esquilino, was the location of one of the Centre of Excellence’s first surveys. Rome, in its role as capital of Italy and as a large city, marked by the coexistence and juxtaposition of ethnically different groups, has assumed a dual role as a driving force for the processes of standardisation of the Italian linguistic community on the one hand, and as a long-standing elective centre of multilingual and interlinguistic contact dynamics, a veritable laboratory for the reorganisation of expressive usages, the ultimate communicative space. Indeed, the capital has played an undeniable role in the process of Italianisation of the peninsula, and in Rome, as early as the mid-nineteenth century, “Italian was considered and ... was to a real and large extent the language in everyday use” (De Mauro, 1989: XVII). On the other hand, Rome has always been a centre of attraction for foreigners, a place of immigration (ibid.: XX), featuring a highly diversified range of motivations and a marked ethnic polycentrism<sup>4</sup>. Consequently, the number of languages present is also potentially very high.

According to data published by the Municipal Statistics Office (Comune di Roma, 2005), the foreign population registered in the city of Rome as of 31/12/2004 was 223,879 people, with an increase of 11% on the previous year. The Esquilino neighbourhood is part of the city’s *Municipio I* administrative area: this is the area with the greatest number of foreigners (25,004, 11.16% of Rome’s total foreign population), and with the highest percentage – 20.4% - relative to the total number of residents (122,634).

For a preliminary analysis of the plurilingualism potentially present in the neighbourhood, we transformed the demographic data into linguistic data, using several sources (in particular Grimes, 2000;

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<sup>4</sup> Apart from motivations of a religious nature, which make Rome a settlement unique in character on a world scale, some of the attraction factors include the job market, marked above all by a flow towards a single sector – that of domestic work – but also building, commerce (of which the Esquilino neighbourhood is the clearest example), hotels and restaurants, and, more recently, independent entrepreneurial activity (Caritas, 2005: 418-420). A thorough examination of the social and working conditions of immigrants in Rome can be found in Comune di Roma, 2004.

Katzner, 1995-2002) to identify languages. The total number of all the languages spoken in all the countries of origin of the immigrants gives a result of 1,581 languages, potentially present within the *Municipio I* area: this figure obviously refers to the languages theoretically possible. Taking into consideration only the official languages of the first 20 countries, we obtain a total of 29 languages (including 13 languages from the Union of India). The top languages potentially present are: Bengali, Philippine (Tagalog), English, Chinese.

We then surveyed the languages used in the texts of social communications within the neighbourhood<sup>5</sup>, with the aim of establishing which of them are visible within the territory, and will thus alter the linguistic makeup, the linguistic landscape of the city. The presence of traces of an immigrant language is a marker of a certain level of development in the process of putting down social roots, and the condition of a language that is putting its roots into the social linguistic repertoire. This presence serves to reinforce the ties between its speakers and their sense of identity within their new environment, and conditions the attitudes and behaviour of the native population, who are brought into contact with signs belonging to a different linguistic code.

Photographs were taken of all texts written in foreign languages, be they monolingual or multilingual, and also of texts in Italian (or contact Italian) where the context was clearly not Italian, such as signs on shops run by immigrants, or where the goods on display were not typical of the local market. Naturally, occurrences in Italian (or contact Italian) were classified where present in multilingual texts.

Traces of 24 languages were found in the Esquilino neighbourhood. Apart from Italian and contact Italian, the other languages found were, in decreasing order by number of traces found, Chinese, English, Bengali, Sinhalese, Spanish, Hindi, French, Russian, Arabic, Romanian, German, Punjabi, Korean, Japanese, Albanian, Tagalog, Turkish, Farsi, Polish, Portuguese, Ukrainian, Urdu. In terms of quantity the range goes from languages with a vast number of occurrences to languages that appear just once in the urban linguistic makeup.

Alongside the presence of languages, an even more significant factor is the way in which these languages are interwoven in use, even within a single text. Indeed, we counted 90 different attested ways of combining languages in a communicative occurrence. There are texts written in a single language, texts in two languages, right up to texts containing as many as 8 different languages. The communicative potential and semiotic value of monolingual, multilingual and mixed-language uses are completely different. The different uses do not serve only to select, and, if monolingual, to restrict the users of a given message, representing the closure of the linguistic community towards

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<sup>5</sup> By *texts of social communication* we mean texts produced through verbal language, written and visible in the urban linguistic makeup. See also Vedovelli, currently in press a. We selected each 'text', considered as a communicative event, featuring the characteristics of text defined in the field of reference, textual linguistics (Vedovelli, 2002: 77).

others. They can also highlight the symbolic value of using a specific language, the presence of a community that continues to use its own language to communicate and, consequently, the strength of this language, as well as the closure of the community towards local usages or, on the contrary, the openness towards linguistic contact both with the local language, giving rise to interlinguistic varieties, as can be seen in contact Italian, and with other immigrant languages. To identify these usage relations we sorted the combination modes between the languages found into 15 different levels (and a level 0).

## 5. Conclusions

The data gathered in Rome highlighted how a large city, a place open to contact, offers the possibility for languages to manifest and combine themselves in a vast range of uses. The texts seen in the social communication space in l'Esquilino show quite a complex and varied urban linguistic landscape: monolingual choices, seen in the use of a single immigrant language or of Italian alone open up to innumerable possibilities for interweaving with other languages, increasing the degree of plurilingualism and openness in language usage. The various modes of combination between languages seen in social communication in this great city appear to be an element capable of preserving the balance between assimilation to Italian and the publicly displayed maintenance of one's own linguistic and cultural identity. Italian represents the highest level of assimilation to the context and to local language uses, and thus openness towards them and towards other potential speakers competent in Italian, whilst the immigrant language indicates the highest level of will to maintain one's identity of origin, but at the same time the highest level of closure of the message towards other users. In terms of quality, not all the languages present in the area are strong enough to make themselves visible alone, without the support of other immigrant languages, or in a situation of coexistence with languages such as English and Italian.

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