Immigrant community integration in world cities

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Immigrant integration is a complex process comprehending many different factors such as employment, housing, education, health, language, legal recognition as well as the built of a new social fabric. In the last years, there have been advances in the definition of a common framework concerning immigration studies and policies, although the approach to this issue remains strongly country-based. The outcome of the process actually depends on the culture of origin, the one of integration and the policies of the hosting country government. Traditionally, spatial segregation in the residential patterns of a certain community has been taken as an indication of ghettoization or lack of integration. While this applies to immigrant communities, it can also affect to minorities within a single country. The spatial isolation reflects in the economic status of the segregated community and in social relationships of its members.
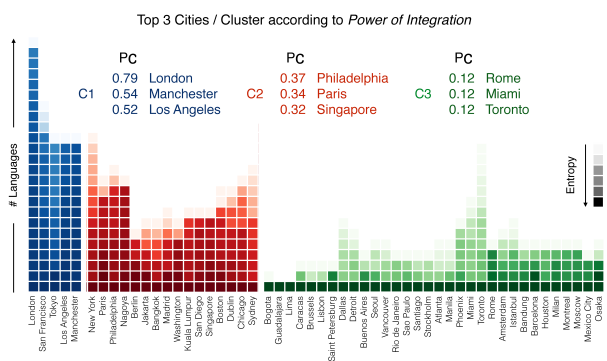

Figure 1: Clusters of cities and Power of Integration. Three groups of cities show similar behavior in the number of communities detected and in their levels of integration. The length of the vectors represent the number of languages (communities) detected in each city; the color scale is representative of the decay of the entropy metric; the Power of Integration metric lead us to evaluate the potential of each city in uniformly integrating immigrant communities within its own urban area according to entropy values.

Immigrant integration has been the focus of many research studies using traditionally national census data and similar surveys. In parallel, in the last few years we have witnessed a paradigm shift in the context of socio-technical data. Human interactions are being digitally traced, recorded and analyzed in large scale. Sources are as varied and different as mobile phone data, credit card transactions, or Twitter data . Going beyond the urban scale, Twitter data have been used to detect the diffusion of human mobility and the languages spoken. Language identification related to the spatial location of Twitter users has been investigated, towards a more complete characterization of spatial local dialects. Fi-

nally, Twitter has been used as a statistical database for representations of demographic characteristics of users and language identification patterns. Several attempts have been made in order to identify, characterize and group international communities in cities based on Information and Communication Technologies (ICT) data and to perform social segregation analyses.

Here we present a novel approach to quantify the spatial integration of immigrant communities in urban areas worldwide by using social media information collected through the Twitter microblogging platform; first, we characterize immigrants through their digital spatio-temporal communication patterns, defining their residence place and most probable native language; then we perform a spatial distribution analysis through a modified entropy metric, as a quantitative measure of the spatial integration of each community in cities and the corresponding relevance within countries. These results have been recently posted in a paper in arXiv [1]. Figure 1 shows, for instance, the level of spatial integration of immigrant communities in the largest world cities as detected from Twitter. The lower the spatial entropy becomes (clearer colors in the figure), the more isolated the communities are. The cities can be classified in three major groups depending on the number of immigrant communities hosted and how well they spatially assimilate them.

[1] F. Lamanna, M. Lenormand, M. Henar Salas-Olmedo, G. Romanillos, B. Gonçalves, José J. Ramasco, *Immigrant community integration in world cities*, arXiv: 1611.01056 (2016).