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Chapter No.: 9 | Date: 9-8-2017 | Time: 10:13 am | Page: 1/5

Author Proof

Socio-spatial Networks, Multilingualism, and Language Use in a Rural African Context

Pierpaolo Di Carlo, Jeff Good, Ling Bian, Yujia Pan and Penghang Liu

Abstract A GIS spatial perspective can provide important insights into many poorly understood sociolinguistic phenomena such as multilingualism in rural Africa. By relying on ethnographic and individual-based sociolinguistic information as well as on high spatial-temporal resolution data, our interdisciplinary team composed of linguists and geographers aims to (i) make original contributions to the cartographic representation of multilingualism and (ii) develop spatial-analytical models able to capture a complex array of linguistic, cultural, and spatial variables for a compact rural area of Cameroon.

Keywords ■■■

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1 Multilingualism, Space, and GIS

The existing literature on the application of GISystems to the study of multilingualism represents the distribution of languages in specific areas—mostly urbanized regions of Western countries—where many languages are spoken by residents (Williams and Van der Merwe 1996; Veselinova and Booza 2009). What has yet to see attention is the spatial analysis of individual patterns of multilingualism, i.e., the ability of a given individual to use multiple languages. Individual multilingualism is a pervasive social feature in many parts of the world, including Sub-Saharan Africa, which is where our area of focus is located. Such an individual-based cognitive phenomenon lacks immediate cartographic representations (Luebbering et al. 2013: 386). In addition, sociolinguistic scholarship on multilingualism has mostly focused on the behaviors of urban migrants, whose multilingual repertoires are characterized

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Chapter No.: 9 | Date: 9-8-2017 Time: 10:13 am | Page: 2/5

Author Proof

by the addition of one or more languages of wider communication—such as, e.g., ex-colonial languages and pidgins—to more localized "heritage" languages. Both limits have made it thus far impossible—in fact, inconceivable—to attempt analyses of how multilingual repertoires pattern in space.

Following a theoretical shift from single languages to communicative practices, some recent language documentation projects have focused on small languages spoken in linguistically highly diverse areas and are now offering novel and more complex views of multilingual behaviors in non-urban regions of the world (see Lüpke 2016 for a review; Woodbury 2011 provides an overview of the practice of language documentation more generally). The multidisciplinary data collected in such projects and the localized nature of the languages documented provide new grounds for the application of GISystems for the study of multilingualism in both geographic and socially-constructed space (Low 2017), and we report on the application of GISystems to a project documenting rural patterns of multilingualism in Sub-Saharan Africa here.[1]

2 The Target Area: Lower Fungom

Our target area, Lower Fungom, lies at the northern edge of the Cameroonian Grassfields, one among the most linguistically dense parts of the world (Stallcup 1980). Many of the region's languages are endangered, and there is increasing consensus that multilingualism in local languages, likely to be an ancient phenomenon, plays a key role in the maintenance of such a diverse linguistic ecology. Within this exceptionally diverse region, Lower Fungom shows the highest degree of language density: in an area of around 200 sq km, one finds eight distinct languages associated with its thirteen villages and roughly 12,000 inhabitants (Good et al. 2011). Moreover, the Cameroonian Grassfields are known to be a "singularity area", i.e., one in which local language ideologies tend to identify a one-to-one relationship between language varieties and traditional political units (i.e., chiefdoms). In other words, locals conceptualize each chiefdom—which in Lower Fungom coincides with a single village—as being the center of a distinct language.

3 The Database

Multidisciplinary field research aimed at developing a holistic documentation of the languages of Lower Fungom has resulted in the collection of linguistic, ethnographic, archaeological, and geographic data. In particular, surveys have been

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Chapter No.: 9 | Date: 9-8-2017 Time: 10:13 am | Page: 3/5

Author Proof

collected that provide detailed information on the self-reported multilingual repertoires of 206 individuals (ca. 2% of the area population), in addition to information on their social ties and family background. On this basis, Esene Agwara (2013) established that there are essentially no adult monolinguals in Lower Fungom and that the average individual speaks around six languages.

The spatial data at hand include a 1:50,000 topographic map, a high-resolution QuickBird image, aerial photos, DEM, and the locations of streams, roads, and footpaths. Such a wealth of information—linguistic, cultural, historical, and spatial—is highly unusual for rural African contexts.

4 Working Hypotheses

Di Carlo (2016) and Di Carlo et al. (forthc.) have proposed (i) that individuals in Lower Fungom acquire multiple languages primarily in order to gain access to the resources associated with different villages and (ii) that language use is not tied to a deep cultural notion such as ethnicity but, rather, is used to index an individual's participation in different kinds of personal relationships, in particular kinship (cf. Brubaker and Cooper 2000). This is different from what is known from Western societies (see, e.g., Fishman 1967, 1977; Irvine and Gal 2000) where languages are seen to be associated with cultural "essences".

5 Expected Outcomes

Ongoing research in the context of an interdisciplinary collaboration including linguists and geographers has three different, but tightly interrelated, goals: (i) transform qualitative data—in particular ethnographic data—into formats that can be effectively used for spatial analysis; (ii) adapt existing cartographic representation techniques to a new domain in order to represent multilingual repertoires and behaviors in space; and (iii) attempt spatial analyses of both individual-based and aggregate data concerning the size and nature of multilingual repertoires (see Sect. 3).

We have created a fine-grained spatial model that can support the exploration of the relationship between individual-based sociolinguistic and ethnographic information and the locations in which individuals reside and have lived in the past. In parallel to this work, we have also developed models for quantifying qualitative data that can minimize the loss of information via a system of weighted variables. This has allowed us to carry out socio-spatial analyses using a range of methods and to create visualizations of linguistic, sociolinguistic, and cultural information in geographic space, building on work representing epidemics in space (see, e.g., Zhong and Bian 2016) as well as economic patterns (Buys et al. 2006).

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Chapter No.: 9 | Date: 9-8-2017 | Time: 10:13 am | Page: 4/5

Author Proof

Preliminary results of this work have allowed for consideration of socio-spatial patterns of language "on the ground" and provide new insights into how the behavior of individuals patterns with observed linguistic-spatial patterns. These results suggest that geographical proximity plays a key role in shaping an individual's multilingual repertoire, with kinship networks also playing an important role. However, neither factor seems to account for the overwhelming majority of the individuals examined, thus suggesting the need to explore additional factors to understand multilingual patterns (see Sect. 4).

The high spatial-temporal resolution available to us, along with individual-level data, is playing a crucial role in uncovering precolonial, *longue durée* sociolinguistic and spatial patterns still at work in rural Africa that might be significant for the maintenance of local languages and that would be otherwise impossible to retrieve. In addition, this work is able to inform our goals for future fieldwork, directing us, in particular, towards the identification of new kinds of sociocultural and economic information to collect which will support the development of more adequate analytical models.

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