Individuals, populations, and timespace
Perspectives on the ecology of language revisited

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In the present article we distinguish the concept of Ecology of Language as articulated in Mufwene (2001ff) from that of Ecolinguistics developed especially by Mühlhäusler (1996ff), Fill and Mühlhäusler (2001), Couto (2009), and several contributors to Fill and Benz (to appear). We explain how Mufwene’s Ecology of Language concept, inspired primarily by macroecology, applies to language evolution. We articulate various factors internal and external to a language that bear on how it emerged phylogenetically, underwent particular structural changes, and, in some cases, may have speciated into separate varieties. The external ecology also influences the vitality of languages, rolling the dice on whether they thrive or are endangered. Because these particular phenomena have been elaborately discussed in Mufwene’s earlier publications, we devote more space to explaining how the notion of Language Ecology, as others call it, also applies as a useful heuristic tool to qualitative sociolinguistics.

Keywords: language ecology, ecolinguistics, language evolution, qualitative sociolinguistics, variation, timespace, populations, individuals

1. Introduction

Ecological approaches to language practice and language evolution (e.g. Mufwene 1996, 2001, 2005, 2008; Calvet 1999) have too easily been lumped together with ecolinguistics (e.g. Mühlhäusler 1996, 2003; Fill and Mühlhäusler 2001; Couto 2009; Fill and Benz to appear), for instance by Edwards (2002, 2011) and Lechevrel (2008), although Lechevrel (2011) refrains from the confusion. The main reason is that practitioners of both paradigms acknowledge inspiration from Voegelin, Voegelin and Schutz (1967) and Haugen (1971), who paved the way in applying in linguistics the concept of Ecology. Having borrowed it from biology at large, they showed how its interpretation as Environment (similar to Habitat and Econiche...
in macroecology) can help articulate factors external to a language that bear on its vitality and/or the evolution of its structures. As also noted by Edwards (2011), both the ecolinguistics and the ecology-of-language paradigms have continued to be informed by macroecology, though articulating different inspirations from it.

Seeking support in environmentalists’ advocacy discourse for the protection of endangered species, self-proclaimed ecolinguists (especially Skutnabb-Kangas 2000 and Mühlhäusler 2003, 2011) have essentially promoted Whorfianism and alerted linguists and other interested persons to the negative consequences of the current loss of “indigenous languages”. According to them, the geographical and demographic expansion of especially European colonial languages has entailed the decrease of linguistic and therefore cultural diversity, including the loss of traditional knowledge of the natural ecologies of the affected populations. These changes, they argue, have especially made these populations less adaptive to their natural ecologies and impoverished humanity culturally.

On the other hand, analogizing languages with viral species rather than with organisms (the tradition in linguistics since the 19th century, with the exception of Paul 1880/1891), Mufwene (2001, 2005, 2008, 2014, 2015a, to appear) has sought to articulate more explicitly what the ecology (internal and external) of a language consists of and what particular factors (such as time of arrival in a colony, demographic strength of the relevant population relative to another, economic power, population structure, types of social interaction, age, gender, religion, and variation in the linguistic system) have influenced the specific ways in which it has evolved locally. He has thus sought to articulate the extent to which differences in local ecologies can explain, for instance, how a language can prevail in one setting but not in another; why a population in one setting shifted away from their heritage language to embrace another, while another population in a seemingly similar situation did not adapt the same way to a similar ecology; and why a language has remained structurally closer to its ancestor in the motherland in one setting but not in another.1

This approach assumes that every setting of language use and human interaction is a contact setting (see also Nelde 2002). According to Mufwene (2001), language contact is fundamentally inter-idiolectal, at the level of individuals interacting (typically dyadically or triadically), even when separate languages are involved. In the same way biological populations are in contact only to the extent that individual members of one population interact with individual members of the other, so too communal languages are in contact to the extent that idiolects of

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1. Similar positions have been articulated by Heller (2002), who prefers to characterize her views as “sociolinguistic”, and Williams (2002), who identifies his work as “geolinguistic”. A germane position is presented by Breton (2002).
their is brought in contact by particular speakers/signers. As also pointed out by Weinreich (1953), real language contact occurs in the minds of individual speakers, where structural information is processed, and where features associated with the same or similar functions are brought into competition and can be negotiated during interactions. Such contact in the mental space is a consequence of interlocutors’ dispositions to use each other’s language and thereby develop competence in more than one language.

For Mufwene, the mind is thus one of the most direct ecologies of language, as it filters all the ecological pressures that are external to the speaker/signer that can affect the evolution of a language. Since evolutionary linguists are interested in languages as communal phenomena, the foregoing conjures up the role and significance of the “invisible hand” (Smith 1776; Keller 1994) or “self-organization” (according to complexity theory). This process brings about communal norms through the mutual accommodations speakers/signers make to each other. It also influences the vitality of a language, because whether the latter dies or stays alive depends on whether its speakers/signers converge in the choices of codes they make during their linguistic interactions (Mufwene 2001, 2005, 2008, to appear).

This essay is not directly about the strengths and shortcomings of these different evolutions from the extension of the biological notion of ECOLOGY to language, which Lechevrel (2011) assesses competently. (See also Edwards 2002, 2011 for informative critiques of the advocacy stand of ecolinguists.) We wish to articulate the specific places of the notions of individual, population, and timespace in the approach developed particularly by Mufwene (1996) and elaborated in Mufwene (2001), hoping to help understand what ECOLOGY is and how much light it sheds on language practice and language evolution.3

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2. We are using evolutionary linguistics here as an umbrella term for historical and genetic linguistics, the study of the phylogenetic emergence and evolution of Language in mankind, as well as the investigation of aspects of language vitality (including endangerment and loss). This is consistent with the practice of evolutionary biology, on which the term is patterned, which deals as much with phylogenetic and historical aspects of organisms and species. We are consistent with Croft (2008ff) and Mufwene (2013a, 2013b) but at variance with MacMahon and MacMahon (2012), who prefer to restrict the term for language phylogeny.

3. We would be remiss not to clarify at this point that ECOLOGY as applying to the habitat or environment of an organism or a species should not at all be confused with ECO SYSTEM. The latter denotes an integrated system of organisms or species interacting not just with their shared habitat but also with each other. Thus, coexistent languages are part of an ecosystem. Multilingualism as a facet of it can indeed count as an ecological factor, particularly when it is associated with unequal power relations, which can influence how a particular language evolves. It is unfortunate that some of the literature has used ECOLOGY for ECO SYSTEM. We are concerned with ECOLOGY proper.
To our knowledge, ours is the first time that anybody has attempted to extend the notion of language ecology to include that of timespace, a concept that Vigouroux (2009) and others (see Section 3.2 below) have borrowed from Wallerstein (2004) to conflate different scales and dimensions of space (geographic, social, and symbolic), time, and other factors that are inseparable, for a better understanding of language practice. We therefore devote more space to this less familiar territory to show how Mufwene’s ecological approach is not at variance with qualitative sociolinguistic and ethnographic approaches to language practice. We submit that it is an integrative approach that enriches them especially in highlighting how the factors that have often been invoked singly to account for linguistic behavior are interrelated dynamically. We thereby highlight complexity in language practice and language evolution, though we discuss this state of affairs only in passing.

2. Individuals and populations

Mufwene (2013a, 2013b) underscores the importance of highlighting the ecological roles that individual hominine anatomical and mental structures have played as prerequisites to the emergence of languages (signed or spoken) as communicative technologies. In other words, the general architecture of modern human languages (consisting of phonic or manual signs produced with specific articulators and used compositionally according to module-specific combinatorial principles/constraints) may not have evolved if hominines had been endowed with different anatomical and mental structures. The human mind and anatomy are thus the requisite direct external ecologies to modern human languages, having largely constrained the particular architectures these technologies would assume.4

4. For instance, Mufwene argues that the selection of phonetic sounds as materials for the manufacture of spoken languages imposed a strict linearity constraint on the architecture of the technology. The particular inventory of phonetic sounds a population settled on had to be combined in specific conventional ways to identify individual words. To make the recognition of individual words less taxing on memory, it is also practical to identify particular morphemes that some composite words are made of and some principles that can help parse and disambiguate combinations such as un+fold+ed ‘not folded’ vs un.fold+ed ‘expanded’. It was thus necessary to limit the number of units or constituents of different sizes at the different levels of the structure of utterances (according to Hockett’s 1959 “duality of patterning”; cf. also Martinet’s 1960 “double articulation”) to make longer utterances easily processable. One must be able not only to break composite words into morphemes but also to identify larger constituents/phrases such as Noun Phrase, Verb Phrase, and Preposition Phrase (PP) in an utterance. One must likewise be able to apply recursion in the production or interpretation of a composite construction such as the book [i]on the table [ii]in the living room [iii]in our apartment [iv]in Chicago [v]in our apartment, in which every preposition phrase (bounded here by two co-indexed brackets, which may include other
Mufwene (2013a, 2013b) also argues that languages would not have emerged if hominines had not lived in social groups that call(ed) for communication between individuals. For him, language as technology was developed incrementally and collectively by populations invested in enabling and sustaining reliable, high-fidelity communication between their members in order to maximize their fitness for survival individually and collectively. Social life is thus another important ecological factor that fostered the emergence of languages as technology for communication. In the history of mankind, it has also influenced whether or not a particular language would be maintained for communication once the economic and political conditions change and how it will evolve if it is maintained.

Underlying the above position is also the assumption that there are no populations without individuals. Thus the relationship between, on the one hand, individuals and idiolects and, on the other, populations/species and individual languages are worth making some sense of. Because every hominine anatomical structure is somewhat singular, variation is to be expected in the mechanical ways various signs are produced and/or perceived. In addition, everybody’s mental structure is singular, despite our belief in Cartesianism, which applies more adequately to similarities rather than to identity in the ways our minds work. Thus, there is room for variation in the ways that meaningful units (most obviously words and longer utterances) are produced or interpreted. A common noun such as *picture* is not interpreted in exactly the same way by two speakers, as its denotation may include drawings for one but not for the other. The noun *image* may be synonymous with *picture* (in some contexts) for one speaker but not for the other. Linguistic communication works so well because the interlocutors are cooperative both in the sense articulated by Grice (1975) and otherwise, such as making up for imperfections or inaccuracies in the way ideas are expressed. Context usually provides enough clues to infer approximately the information the speaker intended to convey, even when they say the opposite of what was intended.

On the other hand, there is also another phenomenon that keeps everybody from developing an idiolect that is completely different from those of other members of their speech community. Convergence produced by the mutual accommodations that speakers/signers make to each other during regular interactions leads them to develop ways that are akin to each other’s, thus to develop communal norms. It obtains among individuals that are connected in the same interac-

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5. This convergence is driven by the fact that every speaker/signer is naturally invested in being understood as effortlessly as possible, without confusion, if this can be avoided.
tion networks or communities of practice, especially when these overlap in the same timespace, as explained below. The convergence produces what Wittgenstein (1953) captures adequately with the notion of family resemblance, which enables communicators to lump only some idiolects into the same dialect, sociolect, or language but not others. When it comes to the definition of a language, the saying “Birds of a feather flock together” should be modified to “Birds that flock together develop the same feather”. For language and culture, it is because the practitioners interact with and can copy from each other that they behave alike.

However, as noted in Mufwene (2001ff), members of particular populations do not interact like players in a sports team operating according to explicitly articulated rules of engagement, pace Saussure’s (1916) seminal comparison of linguistic conventions with rules of a chess game. Moreover, speakers/signers interact within overlapping networks, even more so now with the advent of new technologies of communication; and, because we live in geographically and politically circumscribed spaces (villages, neighborhoods, and cities), populations are typically discontinuous. Members of these spaces (similar to “habitat patches” in macroecology) can borrow from and are influenced by each other through what Hanski (1996) calls “dispersing individuals”, who bridge them. Nonetheless, norms can vary according to networks but more conspicuously according to sociolects, dialects, and languages.

Dispersing individuals exert limited influence in comparison with the internal dynamics within the networks that drive their members to align with one another. The reformulation provided above for the traditional saying “Birds of a feather flock together” accounts for various factors that sociolinguists have found relevant to explaining variable linguistic behavior, e.g., age, gender, and education/profession, which facilitate more frequent interactions between some population members and underlie some of the overlapping networks alluded to above.

In all such cases, it has been assumed, on solid empirical grounds, that individuals respond to social pressure; their linguistic characteristics reflect those of the social groups they are or wish to be associated with, as observed long ago by Le Page and Tabouret-Keller (1985). What has not received as much attention, however, is the phenomenon of non-conformists typically treated as “outliers” in variationist sociolinguistics. Typically, they have been either tossed out or marginalized because they skew group patterns. Such speakers/signers are actually informative about the ecological role of individuals as filters of pressures exerted by nonlinguistic factors associated with peers or the socioeconomic environment. An important facet of the most direct external language ecology that lies in the speaker/signer himself/herself is that individuals are not identical anatomically, do not have identical personalities nor identical mental capacities and, thus, do not process the inputs identically nor respond identically to external ecological pressures (Mufwene 2008).
We must underscore the variation in responses to external ecological pressures largely with the following fact: individual speakers/signers have singular life, hence interactional, trajectories; and these have shaped their personalities and social identities in different (though often similar) ways. Thus, the trajectories have conditioned individuals to respond sometimes in differing ways to similar pressures exerted on them. We are dealing with complexity in human behavior and in the emergence of communal trends. Whatever happens to a communal language is the outcome of what individual speakers/signers do, when the behaviors of most of them converge toward a (new) norm. However, we must also note that individuals’ behaviors need not converge toward total uniformity; “outliers” are part of social life. Norms are only group averages (Paul 1880/1891); they do not make populations uniform.

Although historical linguistics and sociolinguistics in particular are predicated on the existence of communal norms and aim at explaining, respectively, how the norms change over time and vary intra-communally, we must remember that populations consist of individuals. As they interact with each other, individuals are more concerned with whether or not they are understood and with what they gain from communicating in particular ways on specific occasions than with what or how they contribute to the emergence of their communal norms. Thus, linguistic communities consist of individuals, acting alternatively as innovators and copiers, but doing things individually during specific communicative events situated in specific settings (or timespaces), and pursuing varying goals (Mufwene 2001, 2005, 2008). (See also Breton 2002, Nelde 2002, and Edwards 2011 for implicit statements of this position.) The big picture emerging from these interactive dynamics is that, while speakers/signers accommodate each other in different directions regarding different features, the accommodations do not necessarily obliterate variation, and some individuals may remain more singular than others, regardless of whether or not variationist sociolinguists will treat them as “outliers”.

Integrating the distinction between individuals and populations in theories of language enables us to accept evolutionary processes that are not uniform as normal phenomena. For instance, language shift and language loss are not lived uniformly by all members of a population. Thus, as much as French is endangered in Louisiana, there are still some individuals who speak it, although their French is influenced in varying ways by English. As much as language policies in Quebec promote French, not every Francophone expresses the same loyalty to their “heritage language” (Auger 2014; Mougeon 2014). A great deal depends on

6. Another facet of this picture, which we will keep out of this paper, is that norms are just transitory, emergent phenomena; the mutual accommodations keep the “system” continually in a state of flux, in search of equilibrium, according to complexity theory.
how they experience socioeconomic and cultural pressures from the surrounding Anglophone populations or what particular advantages they hope to derive from being (dominant) English speakers. Some may think that they have more to gain economically and socially if they are fluent in English and may not worry if a concomitant of this engagement is the attrition of their competence in French. However, rare are Francophones (in the ethnic sense of descendants of French colonists) who decide consciously not to speak French any longer, even when they are interacting with French monolinguals. Thus, it must be informative to conduct detailed ethnographic studies of different Francophones’ patterns of interaction in Quebec, as indeed in Louisiana, to determine the critical factors that determine whether or not they will become English-dominant.

From a structural point of view, the Africanization of French (from which the characterization “les français d’Afrique” or “les français africains”) and the indigenization of English in former British exploitation colonies have not proceeded uniformly from one speaker to another nor from one former colony to another. Like what are constructed as national varieties, indigenized idiolects do not all exhibit identical sets of divergences from the metropolitan varieties. Likewise, creole continua have also made obvious the fact that their divergence from their lexifiers has not proceeded uniformly across the populations that appropriated the latter even under the influence of same substrate languages (Mufwene 1994).

In all these cases, individual speakers’ language learning-and-practice experiences have not been identical. The speakers themselves are not equally gifted for language either; nor do they face identically the socio-economic pressures exerted on them to perform in the same ways. During the learning process, they have not emulated identical model speakers either. Consequently, the outcomes embodied by their idiolects are different, though usually similar.7

Because populations are discontinuous constructs, identified in macroecology as “metapopulations” consisting of “habitat patches” (Hanski 1996), one can account for dialectal variation and language diversity by invoking negatively the birds-that-flock-together principle proposed above. More technically, the emergence of local or regional norms within “habitat patches” does not proceed uniformly from one patch to another, largely because their pools of variants and interactional dynamics among the variants are not identical. Although the fundamental

7. Despite the focus of evolutionary linguistics on communal languages, we must remember that the drivers of change lie in the interactions of idiolects and the dynamics of mutual accommodation among their speakers, which are not identical across the different timespaces. Although the relevant scholarship, especially in genetic creolistics, has been able to identify a number of the relevant factors that account for the differing evolutionary outcomes (see Section 3.1 below), the details of how the interactions of factors collectively generate the new systems remain in the domain of “self-organization”.
design of the language technology is the same, the specifics of the implementation of the plan are not.

Thus, not only has there emerged what may be termed “American English” as a colonial super-variety distinct from an Australian super-variety, amongst others, but also there is variation within each one of them, according to, particularly, time and pattern of emigration from England, the kind of settlement in the colony, the time and kind of contact with other populations, and the particular English varieties spoken by the colonists (Mufwene 2009). These considerations, which justify Breton’s (2002) and Williams’ (2002) geolinguistics interpretation of the ecology of language make it compelling to enrich Mufwene’s conception of ecology with that of timespace, explained in the next section. All human interactions, including those that bear on language evolution are situated in time and in space, although, to be sure, influence from these factors is mediated through the socioeconomic structure identified by Breton (2002) as “anthroposphere”.

3. TimeSpace as a composite ecological factor

3.1 Space

Although space as an external ecological factor has often been invoked, under the names of setting, neighborhood, and city, amongst others, to explain language dynamics and change, the relationship between space and language has remained under-theorized in linguistics. Certainly, spatial metaphors have long been part of linguists’ toolkit, but, as noted by Johnstone (2004), they have hardly been problematized in sociolinguistics, as if no issues could arise from them.

Historically, geographic space was one of the first factors invoked to account for language variation. Dialectology, the first area in linguistics to have correlated language variation with geographic location, has been primarily descriptive, focusing more on the mapping of linguistic features than on invoking the structuring effects of space on the distribution of linguistic features (Britain 2004, 2010b). No questions appear to have been asked about how linguists’ mapping of linguistic features not only represents but also constructs our knowledge of language variation. Yet, maps are not above the politics of knowledge (Harley 1992).

Sociolinguistics has inherited from dialectology the space-to-language one-way correlation, with space sometimes constructed as one of the causes of language variation. This position has led to the equation that ‘different people talk differently because they come from or are situated in different geographic spaces’. Although a number of studies have shown the relevance of such an assertion, the correlation of geographic space with ways of speaking raises a number of
theoretical and methodological issues. Among them is that of authentic and representative speaker, which was indirectly conjured up in the previous section in relation to inter-idiolectal variation. Because a population is fundamentally heterogeneous, how does the investigator decide which speakers/signers are the most representative of their community? Or should the sampling of subjects include the variation that the reality of local interactions typically exhibits?

Issues of authenticity have often been addressed through the lens of origin and mobility. Individuals are associated with the geographic space they came from and their language variety interpreted as emblematic of this space, especially if they have not traveled away from it until adulthood. Such an essentializing approach has typically erased the fact that authenticity is socially constructed, performed, and imagined through semiotic work, such as linguistic performance (Coupland 2001; Van Leeuwen 2001; Grazian 2010). Moreover, the authenticity-origin equation has become difficult to sustain at our time of increasing geographic mobility and contacts with speakers of different varieties, especially in urban environments. People’s ways of speaking are the outcomes of their multiple encounters and experiences in various socio-geographic spaces, thus, as noted above, of their life trajectories. In other words, being from Chicago or Kinshasa is only a starting point, never the full story (Vigouroux 2009).

Moreover, proponents of the space-language emblematic relation have typically assumed that geographic space is constructed independent of the social actors who inhabit it. Thus, although both diatopic and diastratic factors (e.g. gender, level of education, and social class) have been taken into account in sociolinguistics, they have been conceptualized as if they were independent of each other. Rickford (1986) and Cameron (1990) are justified in criticizing sociolinguists for reifying such social categories and others, as becomes evident below.

Since the 1970s, Marxist geographers have argued that geographic space is as social as social space is geographic. (For a linguist’s review of geographers’ thoughts, see Johnstone 2010.) According to Lefebvre (1974), a geographic space is not just a location where linguistic and other social interactions take place, it is also shaped by these interactions, more precisely by individuals inhabiting the space and interacting in it. Consequently, space should be studied as a dynamic locale that is constantly being constructed. Thus, a geographic space is not neutral; it is the product of particular social relations and activities. Our task as linguists is therefore to understand what social activities construct geographic space, therefore how language practices shape it as a process, while it in fact situates the activities themselves.

In other words, geographic and social spaces as part of language external ecology have a history shaped in some ways by the population whose language is influenced by them. European settlement colonies of the Americas can be invoked here
to illustrate this position. As explained by Chaudenson (2001, 2003) and Mufwene (2001, 2005, 2008), the differential evolution of European colonial languages was a consequence of the particular population structures that the colonists developed locally, and indeed variably from one colony to another, to support the economic regimes they had instituted. Where race segregation became part of the socio-economic structure, it was in response to the small proportion of the emergent colonial population the Europeans constituted, especially in colonies where sugarcane or rice cultivation was the primary industry. Thus creoles emerged as varieties that are structurally divergent from their lexifiers not as direct by-products of the tropical spaces where they developed but of the particular ways in which these geographical spaces were constructed by the colonial masters and to a certain extent also by the enslaved people themselves that evolved in them. The racially-segregated colonial population structure prevented most of the enslaved people from interacting (regularly) with European colonists and fostered language transmission from nonnative speakers to new learners in the majority of cases, which facilitated structural divergence.

This hypothesis is verified by the fact that no particular ethnolect associated exclusively with (descendants of) enslaved Africans emerged in Brazil (Naro and Scherre 1993; Negrao and Viotti 2011) or in former Spanish colonies, where no race segregation system was institutionalized on the model of that found in former English and French insular and coastal colonies (Mufwene 2008). African American English is genetically and structurally akin to American White Southern English, from which it was indistinguishable until the late 19th century (Bailey and Thomas 1998). They have a common ancestor in the colonial English spoken on the tobacco and cotton plantations, on which the African population was a minority and race segregation was instituted only after the abolition of slavery (Mufwene 2000, 2015b).

Interpreting physical locations as socially constructed prompts linguists not to posit space as an a priori, thus as a static neighborhood, region, or country whose boundaries are defined arbitrarily by administrative conventions. Instead, a space can be defined by particular social practices that give it significance. These include the particular culture(s) and language variety or varieties that have been evolving in it. Along the micro-macro continuum, this prompts us to heed Duranti and Goodwin (1992) and revisit the notion of setting, often defined as the physical contextual backdrop of a speech event, for instance, a physician’s office, a church, or a market, per Hymes’ (1967) SPEAKING model. Accordingly, language use has

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8. SPEAKING is Hymes’ acronym for setting/scene, participants, ends, acts sequence, key, instrumentalities, norms, and genre.
typically been approached as framed by the setting, viz., a speaker uses a language (variety) X in a setting Y, but hardly as framing the setting.

Vigouroux’s (2005) comparison of Francophone African migrant traders’ contrastive language practices in two adjacent craft markets in Cape Town’s city center, which are physically very similar but are constructed as different by them, underscores the importance of approaching a setting as constantly (re)created and maintained by language users. The two markets are located near each other, 200 meters apart; they both sustain the same trading activities; the African artifacts sold at the two markets are identical; they share the same customers, who often go from one market to the other; and many of the traders work at both markets, alternating between the two. Yet, at one market, the Francophone African traders conceal their Francophonity by interacting only in English with their Francophone European customers, while at the other they use French to lure them away from the non-Francophone traders.

Such differing language practices cannot be explained without taking into account the way in which traders construct the two spaces. Because of its long history, the first market, Green Market Square, is defined both by insiders and outsiders as a local market, epitomizing Cape Town. Although, over the years, the Francophone African traders have contributed to transforming it from a local flea market into a transnational African craft market, they are still considered as foreigners/outsiders. From a business point of view they are in competition with Anglophone local and foreign traders. Using English puts them on a par with those using the local official language and enables them to pass as insiders/locals and sell their goods in the same way as other non-Francophone traders.

On the other hand, the second, fairly recent market, the Pan African Market, was opened in 1996 by foreign African traders to promote Pan African crafts in Cape Town, true to its name. The majority of traders working there are of foreign African origin. In this setting, displaying Francophonity becomes a sign of distinction in a location where the traders’ legitimacy as locals is not an issue. Speaking French becomes an asset from which they can reap benefits especially with Francophone European customers, who often do not speak English fluently.

Like the colonial setting example, this one situates the spatial fold of language ecology in the frame of “niche construction” (Odling-Smee et al. 2003), according to which the environment and the organisms it hosts coevolve, influencing each other. In this case, differing definitions of, for all intents and purposes, the same physical space generates contrasting kinds of positionality, which trigger different language practices and relations between actors (traders and customers). It is precisely these practices that make evident the variable ways in which a space can be defined.
This realization about how the space and actors shape each other (regarding function and activities, respectively) is significant for sociolinguistic theory. For instance, it prompts us to reexamine the notion of community of practice (Lave and Wenger 1991; Eckert and McConnell-Ginet 1992). This is defined as a group of people who interact with each other because they are engaged in a common endeavor. They may be neighbors, a group of friends, or a church congregation sharing common social interests.

From a theoretical point of view, the community-of-practice approach marks a shift from traditional, broad and abstract groupings of speakers according to socioeconomic class, age, or gender (among other factors), regardless of whether or not they actually interact with each other. Values and ways of doing things, including speaking, are therefore understood as produced by and enacted through regular joint activities. On the other hand, as shown by Vigouroux’s example of the two markets, divergent linguistic behaviors may naturally emerge between people who belong in the same community of practice. We submit that this must be complemented with a more inclusive ecological ethnographic approach that highlights how language practices are shaped by and in turn construct the physical space in which they occur.

Perceptual dialectology, whose practitioners (e.g. Preston 1989) gather folk perceptions of accents and map their geographical distribution, is another good illustration of the social construction of physical space. It shows that speakers’ emic perceptions of language boundaries typically do not match linguists’ isoglosses. Such discrepancies point out that what speakers interpret as geographic differences usually belong to the realm of ideology, where social boundaries are drawn between “we-and-they groups” (Iannaccaro and Dell’Aquila 2001).

Consistent with the ecological approach, perceptual dialectology is more inclusive in highlighting the intrinsic relation between the diatopic and the diastratic dimensions of language use by analyzing them together. It also shows that the construction of space is as ideological as it is physical (Johnstone 2004), as we argue below. Ideology may enter the construction of patterns of linguistic diversity within a given space, as people may choose to interact or not to interact regularly with members of a particular group and thus to adopt or avoid their

9. Kretzschmar (1996) shows through his probability maps that dialect areas are in fact not continuous. Dialectal features do not spread continuously over geographical areas but rather tend to hop from one subarea to another. Where there seems to be geographical continuity, the probabilities of usage vary from one location or subarea to another, suggesting also coexistence with other alternatives. In American English, this is as true of the regional distribution of lexical items such as *pail* versus *bucket* as of phonological features such as the presence or absence of postvocalic */r/-constriction in words like *fourteen*. Moreover, the geographic distributions of different features are not coextensive.
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salient linguistic features (Eckert 2004). Perceptions of and attitudes to “Black” and “White” features in American English may be accounted for from this perspective, in some timespaces.

The same applies to the so-called “parlers des banlieues” in France as discussed in, for instance, Gadet (2003a, 2003b) and Fagyal (2010). The features associated with these particular varieties that are “othered” by the dominant population of a polity are not necessarily unique to them. In the particular case of “les parlers des banlieues,” associated typically with “immigrant youths” in economically disempowered suburbs of French cities, many of the grammatical features are not even their innovations. These features, which are not shared by all the youths either, are largely the legacy of the Native Hexagonal working-class populations that have migrated out of the relevant neighborhoods.

Such findings advocate for a non-deterministic approach to physical and social spaces, especially in factoring speakers’ agency in. In other words, a person sounds the way he/she does because he/she may have chosen to align him-/herself with particular people, or indeed not to sound like other persons he/she does not want to be lumped together with, but not necessarily because he/she comes from the place associated with the accent.

We do not deny the fact that a speaker’s way of speaking likely links him/her to a particular timespace because of the particular congruence of historical processes that placed him/her there, subjecting him/her more to the influence of his/her neighbors if they socialize regularly together. The African immigrant families that make a substantial proportion of the relevant French cities’ suburbs were forced into these neighborhoods by their destitute economic conditions. Their children nativized linguistically, though in the process they partly restructured the varieties, especially their lexica, in ways that index their current marginalized cultures. Their residential neighborhoods, combined with the low socioeconomic class of their parents, have largely contributed to their subaltern position within the mainstream French society. Our point is simply that the neighborhood does determine a speaker’s way of speaking in an inevitable way. Indeed, the “immigrant youths” in the French “banlieues” do not all develop the speech characteristics stereotypically associated with these neighborhoods.

As argued by Johnstone (2004), being a “local” is about how locality is embodied or, in some cases, how outsidersness is concealed by speakers through their selection of linguistic features; it is not an essentializing relation to a given environment. It is precisely because the relation is not essentializing that all speakers in a particular timespace do not behave in exactly the same way, despite the emergence of some norms, which are evidently not universal, within their community of practice. Individuals that, for example, Labov (1972a, 1972b, 1994) identifies
as “lames” and “outliers” in his study of African American Vernacular English are evidence of this observation.

Thus, the interrelation of geographic with social spaces is not tantamount to a strict ecological determinism according to which spatial structures would unilaterally ordain the patterns of social organization or social factors alone would specify the particular social activities that can occur (Lefebvre 1974). That is, a geographic area does not ipso facto determine a set of social practices; it is itself both socially produced and behavior-generating on the model of niche construction. It is also typically shaped variably, as the individuals inhabiting a particular timespace do not fully converge in their behaviors, consistent with the linguistic notion of idiolect and the Wittgensteinian notion of family resemblance.

We should pause for a moment and ask what is actually constructed about space: its meaning or its materiality? Space shapes language practice by influencing “ways of speaking” that arise partly from the mutual accommodations speakers make to each other but also from the fact that learners pattern themselves on the current speakers, who learned or shaped the local norms before them. For example, one is expected not to talk loudly in a library or not to use vulgar language in a church, generally because that is how everybody else before him/her has typically behaved. Doing otherwise is likely to invite social sanctions such as a reprimand or ridicule. On the other hand, what is considered as good communicative behavior in one timespace may be considered inadequate or improper in another. For example, erudite speech may be admired at an academic meeting but is likely to be ridiculed as pedantic at a casual social gathering or simply be considered amusing.

It is certainly informative to further reflect on the interesting ways in which speech and ecology covary, since the same topological space can be redefined several times over as a different ethnographic setting, depending on the specific social activities in which particular actors are engaged in it. Thus, one’s living room may call for formal language on one occasion but for (very) informal and even vulgar language on another, depending on what particular individuals (family members or coworkers) are interacting in it and for what particular purpose (e.g. celebrating a birthday, discussing family issues, planning an important business venture, flirting, or fighting).

While Blommaert et al. (2005a) are justified in arguing that linguistic competence must be evaluated relative to the relevant ethnographic setting, the above discussion also suggests that language varieties may sometimes ‘travel’ well from one geographic space to another, depending on how these timespaces are socially constructed. The language of the workplace can travel to one’s living room, just as the usual vernacular of one’s living room or social club may travel to one’s office, when the latter is also used for socializing. It is indeed true that a linguistic
resource that enables a speaker to communicate successfully in a given setting may not be as successful in another (Blommaert et al. 2005b). However, it also appears that the communication problem may be solved by just redefining the setting in the way explained above, although not everybody has the authority and competence to do so.

An advantage of the ecological approach over the traditional sociolinguistic and ethnographic paradigms is that the concept of ecology not only connects the different factors that bear on linguistic behavior in the present case but is also dynamic. It avoids the traditional static and autonomous ways that space in particular has been invoked in linguistic analyses of verbal interactions and language evolution.

The above discussion is not intended to dismiss outright the material construction of space. The first example that comes to mind is architecture. Markus and Cameron (2002) analyze a short 1807 text, attributed to the architect William Stark, about the organization of the Glasgow Lunatic Asylum. The text provides the taxonomy that applies to the intended residents of the building. Through a fine-grained discursive analysis of Stark’s taxonomy and his architectural plan of the asylum, the two authors demonstrate that social hierarchy translates into spatial and discursive organization. Patients are categorized according to sex (men and women are located in the two opposite wings of the building), social class (inmates of higher rank are located at the front of the building, while the others are relegated to the back), and medical diagnosis (less afflicted patients are housed near the center while the others are assigned to remote wards).

According to Markus and Cameron, the spatial arrangement of the asylum does not follow the discursive construction of the taxonomy in the same straightforward way. Yet, there is a homology between spatial, social, and discursive hierarchies. For example, in the textual layout, men are graphically positioned above women and patients of a higher rank are placed before inmates of a lower rank. In addition, the way the space of the asylum is organized constrains the ways people can operate in it, with the privileged ones (men of higher rank who are less afflicted) given more latitude to circulate. Thus, the physical ecology of the asylum influences its functional construction as a social institution and thus as a functional ecology, which in turn influenced William Stark’s discourse. This creates an interesting “cascade of [partial] ecological determinisms” that favors particular behaviors without necessarily precluding alternative ones.10

10. In a number of unpublished lectures since 2005, Mufwene has invoked this cascade of ecological determinisms to explain, relative to the evolution of European languages in the colonies, how the geographic ecology influenced the choice particular economic regimes (e.g. farming vs. plantation), how these in turn favored particular population structures (integrated vs. segregated
The example above shows that regarding space the issue of “which meaning” is related to those of “whose meaning” and “for what purpose”. Put differently, who gets to decide on the competing meanings of space? Can geographic space be free of ideology and power dynamics? The following example of the organization of a workspace may provide an answer. Describing call centers, Sewell and Wilkinson (1992: 283) talk of “virtual panopticon”, because the centers’ spatial distribution enables constant surveillance of the employees by the manager and by each other. Operators have no privacy: they can always be looked at and listened to. While such an open work-environment constrains the employees’ daily practices (for example they cannot entertain private conversations), it also aims at creating a sense of egalitarian relationships, which, on the surface obliterate social hierarchies (Gee et al. 1996). In this case, ideology is embedded in space; it is not only made visible through spatial organization but also enacted.

3.2 Time

We should now turn to the other fold of this section: time as an ecological factor. As suggested by the spelling *timespace*, time and space are intrinsically intertwined. According to Wallerstein (2004: 98), who coined this spelling, “for every kind of social time, there exists a particular kind of social space”. However, does the statement that any event is situated in time and space sufficiently justify blending time and space into a single word and a composite concept? How do we account for time in the construction of space and therefore in language practice?

A spatial-temporal turn occurred in linguistics a few years ago when Blommaert (2003) and Blommaert, Collins and Slemrouck (2005a), amongst social ecologies), and how these influenced language evolution regarding the emergence of creole and non-creole varieties. Ecological determinism was not absolute to the extent that, for instance, developing one form of economy rather than another depended also on the time of the colonization of a territory relative to another (the periodization factor), on the European markets’ particular interests, and on the availability of capital. Determinism as influence of particular constraints was real when it ruled out particular economic regimes in some territories. Thus, as lucrative as it was, sugarcane cultivation would not have been a wise investment in most colonies north and south of the tropics and in arid lands. It was also real, albeit partially, when an economic regime created a drastic disproportion of numerous enslaved Africans relative to fewer Europeans and the colonial administration found it necessary to institutionalize race segregation in order to ensure the security of European colonists against potential slaves’ uprisings.

11. Bakhtin’s (1981) notion of *chronotope* also highlights the intrinsic intertwinemement of time and space, without privileging one over the other. Because of lack of space, we will ignore it in this article, although, as observed by Blommaert (2015), it is relevant to the study of language practice.
other linguists, became interested in the effects of “globalization” on language practice. At the heart of the matter was the wish to broaden the sociolinguistics paradigm in order to account for speakers’ increasing mobility across transnational and socio-historical spaces and to understand the transformation of the forms and functions of linguistic resources as these are lifted from some sociohistorical spaces (identifiable also as economic and political ecologies) and are reinserted into new ones. Their intention was to invoke ideological, geographic, and socio-economic factors concurrently in order both to explain small-scale language dynamics and to bridge the micro/macro dichotomy around which many studies have been articulated. However, as we show below, creolistics was far ahead of the game, as in fact suggested already by Collins, Slembrouck and Baynham (2009).

Globalization is a spatial-temporal phenomenon par excellence, because it involves different scales (viz., local, regional, national, and transnational) due especially to the time compression enabled by the advent of faster communication and transportation technologies, especially with the current option of transferring information digitally. However, the most recent forms of globalization\textsuperscript{12} call for revising some of our core working assumptions in linguistics. These include the following: community, which is more and more difficult to define spatially, because social relations and verbal interactions now stretch over local physical spaces and often across national boundaries; speech community, to which some sociolinguists such as Eckert and McConnell-Ginet (1992) prefer community of practice, as explained above; culture, because it is harder to associate it with a bounded space; and locality, since our interactions are less and less constrained by the physical \textit{hic et nunc} of the speaker/signer.

Among the questions that the study of globalization and language practice raises are the following: What are the relevant spatial units of analysis that account for language dynamics at a time when the policies of modern nation-states and civil societies are increasingly based on transnational spaces, which challenge the bounded socio-historical spatial conception of the nation-state (Heller 2008)? How do we analyze interactions in societies where distal relationships are no longer clearly distinguishable from proximal ones? Since the global is understood as a web of interconnections, what are the natures of the connections that obtain between the different spaces and therefore between the people who inhabit or evolve in them? What are the actual linguistic outcomes of these interrelations? To the extent that these interconnections and the consequent interdependences influence

\textsuperscript{12} We speak of “most recent forms of globalization” because we believe that globalization is not a recent phenomenon (Mufwene 2005, 2008), just some of its forms as experienced now are new. For a very comprehensive discussion of this notion, grounded in historical depth and multiple perspectives, see Chanda (2007).
language practice and language evolution, they are facets of the external language ecology, though the pressure they exert on speakers/signers may be experienced indirectly, mediated by other factors.

We think that linguistics can contribute to the understanding of globalization by explaining how the interconnectedness of different temporalities and (distant) geographical spaces bears on social and therefore language practices. Part of the challenge, theoretically and empirically, lies in identifying the scale(s) as levels of conceptualization (including the extent of details) in which language practice or any social action can be represented, interpreted, and/or articulated.13 We argue that the relevant spatial-temporal units of analysis are shaped by semiotic practices; they should not be posited a priori by the researcher, as we show below. The facts suggest what the parameters and units of analysis are.

Our example comes from Vigouroux (2009), in which she discusses, from an ethnographic perspective, multilingual practices in a Congolese Internet café in Cape Town’s city centre. She noticed that written notices posted on the walls either to inform customers about the prices and services that are offered or to prevent any potential dispute display a range of language resources, which vary according to the communicative functions of the notices. For example, all regulatory notices are written in English, in French, or in both. Although most of the customers are African migrants from the Democratic Republic of Congo (DRC), no African language is used in the regulatory notices.

Vigouroux argues that the exclusion of African languages from the notices both re-enacts and maintains at the local level of the Internet café linguistic hierarchies and asymmetrical power relations constructed in another timespace: the homeland at the time when the Congolese managers left it. The notices enable the intertwining of the two distinct and seemingly unrelated timespace scales: the bounded physical location of the Internet café constantly redefined by the ongoing language practices of its regular users (both employees and patrons) and the more diffuse timespace scale of language ideologies instilled by the education system and sustained by long-term language policies and the economic system in DRC. The very fact of constructing English and French as more appropriate for business precludes possible fraternizing, hence social closeness and bargaining, between the customer and the service provider, which an African language can enable. This example illustrates how ideologies shaped long ago in the homeland

13. The same questioning also applies to geography. It has prompted some geographers to revisit units of analysis such as region, neighborhood, and nation (Howitt 1993; Brenner 2001; Marston and Smith 2001). In linguistics, see Blommaert (2007, 2015) and Blommaert, Collins and Slemrouck (2005a, 2005b). For an informative discussion of the influence of Wallerstein’s world-systems analysis on the theorization of scale in sociolinguistics, see Prinsloo (to appear).
have been incorporated by the author of the notices.\textsuperscript{14} It also highlights the way in which activities can be governed by different time frames in the same locale.

This interconnection of two different timespace scales illustrates what Lemke (2000) calls “heterochrony”, which is defined as “a long timescale process [that produces] an effect in a much shorter timescale activity”. Heterochrony entails that scales are intrinsically relational (Howitt 1993, 1998), and therefore should not be approached in dichotomous macro/micro terms, with the micro scale being analyzed as a downsized reproduction of the macro. This dichotomy is no longer tenable in a world where overlapping socio-spatial networks are articulated on different scales.

We interpret scale dialectically and non-hierarchically with no single scale treated as more basic or significant than (the) others. We submit that there is no absolute space that can be constructed independent of various factors; it is constructed by the activities it enables. One may interpret it as a set of spatial relations. Temporality is inscribed in and constructs each scale; it also enables and articulates the relationships between them. As illustrated in the above example of the Internet Café’s notices, language practices make the weaving of these different temporal modalities noticeable.

Although the notion of scale is fairly recent in sociolinguistics, the idea it seeks to capture is not. Older linguistic notions such as vernacular, vehicular, and lingua franca have definitions that are scale-based, viz. the vernacular language (variety) is used “at home” and in informal interactions, whereas the vehicular language or lingua franca bridges two or more language communities or timespaces associated with different vernaculars. The same applies to the notion of world language used for languages that function at a higher scale, transcending the geographic boundaries associated with nation-states.

Geolinguistic imagination has traditionally been constructed on the scalar model, with languages ranked on a continuum of more, or less, global, and English as today’s world language par excellence. At the other end of the scale conceived of in a ladder-like fashion are several ethnic vernaculars, especially those spoken by small groups and population isolates, and new nonstandard varieties such as creoles, all perceived as bound to their localities.\textsuperscript{15} Such a scalar approach

\textsuperscript{14} During her fieldwork, Vigouroux noticed that the producer of the notices wrote emails in both Lingala and French, revealing that he was literate at least in one of the vernacular languages of DRC.

\textsuperscript{15} There are of course some exceptions, such as Haitian Creole, whose diasporas of speakers are perhaps as large as the population still residing in the homeland. Nonetheless, the diaspora members are united by their connection to Haiti; and Haitian Creole in the diaspora is confined typically to vernacular interactions, for the purposes of intimate socialization in the family or
to languages re-enacts hierarchized socioeconomic spaces constructed as centres vs. peripheries (Wallerstein 2004), be they urban vs. rural areas, cities vs. banlieues ‘suburbs’ in the French urban landscape, northern vs. southern hemispheres (Nord vs. Sud in the Francophone political discourse), the French Hexagone (the metropole) vs. overseas departments, etc. All these scales help us interpret interactional dynamics, especially regarding language choice, and differential language evolution more accurately. We get a sense of why speakers do not behave uniformly in/with the same languages.

To be sure, Britain (2010a) is right on the mark in pointing out that historical linguistics has generally omitted to take the relevant socio-spatial factors into account in purported explanations of the dynamics of language change. He simply overlooks the important contribution that the scholarship on the emergence of creoles has made to the subject matter. Scholars such as Singler (1996), Chaudenson (2001, 2003), and Mufwene (2001, 2005, 2008) have highlighted the relevance of population movements and the ensuing contacts and population structures. More generally, they have articulated the sociohistorical ecologies in which these new vernaculars emerged, in order to better understand language speciation.

The ecological approach developed by Mufwene grew from a number of questions that the emergence of creoles prompts but the current literature had failed to answer to his satisfaction. Among these questions are: Why have creoles emerged in certain geographic spaces but not in others? As noted above, the latter include Brazil, which had engaged in sugarcane cultivation, using the labour of enslaved Africans, for over a century before the Caribbean and Indian Ocean European plantation settlement colonies invested in this economic activity. It also had more slaves than all these other colonies combined and abolished slavery only in the late 19th century. On the other hand, there are small colonies such as Cape Verde and Curaçao that did not have large permanent slave populations and did not sustain sugarcane cultivation but produced creoles. What specific population structures fostered the emergence of creoles that turn sugarcane or rice cultivation into a mere contingent factor?16

bonding at national social gatherings or cultural functions. One may use it also ideologically to promote one’s national cultural heritage in formal settings, just as a politician may use it for political gains in Haiti.

16. There are indeed other places such as Korlai (India), Malacca (Malaysia), Macao (China), and a few islands of the Philippines, which produced varieties also called “creoles” for reasons that are not evident, other than the race of their speakers. They have indigenous communities that lived with the colonists, Christianized, shifted to Portuguese or Spanish as their vernacular, naturally indigenized it, and continued to speak it after the colonists had left. They raise issues about the criteria for identifying a language as creole, which we will not get into in this article.
In the process, Mufwene went as far as to hypothesize the cascade of ecological determinisms mentioned above (explained in note 9), which shows that in the vast majority of cases, language evolution in the colonies was ultimately influenced by their respective geographic ecologies, because these played an important role in favouring the particular economic systems that the colonists would develop. The economic regimes bore on the population structures that emerged, and population structure bears almost directly on language evolution, through how it determines which individuals interact with which others, notwithstanding other factors that have to do with their respective language learning skills and the rate of population replacement, among other factors we need not get into here (Mufwene 2001, 2005, 2008, 2010). One may thus look at plantation colonies as specific timespaces that were both reshaped by the heterogeneous populations that came to inhabit them and influenced language evolution according to the particular interactional dynamics that colonization generated.

In this context, the role of periodization, adduced by Chaudenson (2001) to explain why Cuba and the Dominican Republic did not develop creoles despite the slave majority on the sugarcane plantations, appears to be a significant dimension of timespace. The relevant Bozal (African-born) slaves were brought to the plantations in the 19th rather than the 18th century, after an important Black Creole population had emerged that spoke colonial Spanish. The Bozal slaves had ample exposure to this colonial Spanish and had no reason having to do with population structure to develop a creole. One must also remember, regarding the Creole slaves in Cuba and the Dominican Republic, that the population structure of these islands, like that of Brazil, was not segregated racially, unlike that of French and English colonies.

4. Conclusions

Although Mufwene has been inspired especially by population genetics and macroecology to account for aspects of language evolution, especially the emergence of creoles and language speciation, it appears that he has also provided an integrative approach that bridges sociolinguistics and language evolution. To date, Mufwene has focused on the macro-level, although he has also invoked ecology to account for the selection of particular structural features into the emergent varieties.

We have shown above that the approach applies to both macro and micro aspects of language practice and need not be restricted to aspects of language evolution. It is not at odds with traditional approaches to these subject matters but finds them wanting for more explanation. Thus, it calls for the factors traditionally invoked to account for language behavior to be considered concurrently with others,
mentioned and/or discussed throughout the paper, that appear to complement them. We have shown that these factors are not mutually exclusive and should not be considered as independent of each other.

Underscoring the complexity of language behavior, this ecological approach also highlights the dynamic nature of the interactions and interdependences between some of the factors. It enriches sociolinguistics in ways similar to the contribution it has made to evolutionary linguistics. It is informative to consider the ecological factors globally and to highlight how interdependent some of them are. Thus, it shows how much linguistics has to gain from being informed by other disciplines and from being integrative within.

The focus on individuals and variation among them is especially important, because it draws attention to the question of how communal norms, patterns, or trends emerge when individual speakers/signers converge in their behaviors. On the other hand, it explains why the emergence of communal norms is not at odds with the fact that some members of a population do not participate in the convergence process. The individuals characterized in sociolinguistics as “lames” and “outliers” are just as normal as the other members of their communities that fall within the norm. It is in this context too that linguistics must factor in the role of ideology not only in individual linguistic behaviors but also in the construction of concepts such as SPACE and TIME.

Acknowledgements

This article is a substantially revised, elaborated, and updated version of one we published under almost the same title in 2012, in Cahiers de Linguistique 38(2): 111–138, in a special issue titled Construction des connaissances sociolinguistiques: Du terrain au positionnement théorique, edited by Françoise Gadet. We are grateful to our anonymous reviewer and to the editors of Language Ecology for their advice. We are alone responsible for the remaining shortcomings.

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doi: 10.1515/IP.2007.001

doi: 10.1146/annurev-anthro-102214-014035


doi: 10.1515/9783110219166.1.69


doi: 10.4324/9780203440292


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