

Organizadores

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**DA FONOLOGIA À
ECOLINGUÍSTICA**

ENSAIOS EM HOMENAGEM A

Hildo Honório do Couto

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THE ECOLOGY OF LANGUAGE: SOME EVOLUTIONARY PERSPECTIVES⁶⁵

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1. Preliminaries

I have explained my take on the ECOLOGY OF LANGUAGE in Mufwene (2001, 2005, 2008) and acknowledged therein the intellectual debt that we owe to Voegelin, Voegelin, and Schutz (1967) and Haugen (1971) for showing how a concept originally developed by biologists to account for the vitality of organisms and species in their natural habitats could be extended to explain the fates of languages in their social environments.⁶⁶ This is the fundamental position developed in the

65 This is essentially a position essay in which I summarize my personal manifold interpretation of the ECOLOGY OF LANGUAGE and situate myself in relation to Hildo Honorio do Couto, whose scholarship is being celebrated in the present volume. The pragmatic constraints of its production prevent me from elaborating some of my own views and likewise from citing as many references as I could. Many of those omitted may be found in the representative writings of mine cited below. May the reader accept this deliberate and practical omission.

66 As in Mufwene (2004, 2008), I am avoiding here, with the term *vitality*, the dominant bias of linguistics, especially of the past quarter century, which has drawn attention almost exclusively to language endangerment and loss. The discipline has hardly articulated the ecological dynamics that still keep alive many languages, major and small ones alike, and help some of them expand demographically, geographically, and/or ethnographically, regarding contexts of use in the latter case. I use *vitality* rather neu-

branch of biology known as macroecology, from which I have sought inspiration since the the 1990s. It is reflected in my discussion below, which also clarifies those respects in which I have diverged from other linguists who have also invoked language ecology in one way or another, especially advocates of language revitalization.

As observed by several linguists since the 19th century, especially Darmesteter (1886), languages too have lives. However, as clarified in Mufwene (2001, 2008), we can account for the birth, vitality, and death of languages adequately only if we also conceive of them as species, albeit of the viral kind, whose existence depends on the interactional practices of their speakers, who are both their creators and their hosts. The focus on species, rather than organisms (the tradition since the 19th century) is critical, because it highlights the significance of variation within a language as an extrapolation from what is otherwise a population of idiolects spoken by individuals communicating with each other. The vitality of languages depends on how regularly the populations, consisting of individuals, associated with them get to use them in various settings, with the consequences varying depending on whether they are used in all domains of the speakers' knowledge/experiences, only in some but not in others, or in none at all.⁶⁷

trally, as an umbrella term that applies to all the possible evolutionary trajectories that the life of a language can take, although every now and then I use it more narrowly in the phrases *loss/lack of vitality*.

67 As explained in Mufwene (2004, 2008), languages are not born in the same ways that individuals or organisms are. In this respect, as in many others (Mufwene 2001), languages are indeed like biological species, in that their births are stipulated post-facto, without any acknowledged period of incubation or pregnancy, after speciation has been determined between the variety considered new and another considered older. It takes some critical mass of speakers associated with the new variety for some observers to stipulate its birth. Likewise, unlike the death of an organism, that of language or species is gradual, marked by the contraction of the population of its speakers and the contraction of its domains of use, except of course in cases of genocide. As it is not clear whether Latin is a dead language or continues a metamorphosed life through

Thus the vitality of languages conceived of as parasitic phenomena depends not on what languages themselves do, if these had any agency at all, but on what their speakers do. This observation suggests, as I argue below, that there can be no accurate account of the ecology of a language that does not factor in the populations associated with specific languages and the ethnographic settings in which they evolve, including the socioeconomic structures that lead speakers to decide what particular languages are more advantageous to them in particular communicative events. (See Mufwene & Vigouroux 2012 for a more comprehensive characterization bridging the evolutionary and synchronic/ethnographic dimensions.) This position implies that VITALITY becomes an issue only in situations where more than one language is spoken, a situation typically created by population contact, the traditional prerequisite for language coexistence, thus a situation of language contact, and often of language competition.⁶⁸

I would be remiss not to clarify now already that COMPETITION, which is typically used in association with (natural) SELECTION in Darwinian evolutionary theory, should not be interpreted in linguistics (no more than in biology) as

the Romance languages (but note the birth of the latter by speciation!), I will not deal with claims of language death by structural erosion or contamination from another language.

68 Although I refer only to languages throughout this essay, my arguments apply also to cases when dialects of the same language come in contact with each other, especially when the relations are not egalitarian, such as between standard and nonstandard varieties. Note also that competition does not always result in one language (variety) driving its competitor(s) out to extinction. Sometimes the ultimate outcome of the competition is nothing more than a division of labor between domains of usage, which underscores why it is informative to articulate concretely what particular ecological conditions lead to the extinction of some languages. This is more accurately done when also factoring in the variable SPACETIME dynamics explained by Wallerstein (2004) and integrated in my ecology-of-language approach in Mufwene & Vigouroux (2012), as explained below. The question becomes even more compelling when the same language thrives in one territory but loses its vitality in another, as in the case of several European and African languages in New World colonies.

if languages had some animacy and actively vied for speakers. Although a language prevails on its competitor(s) when it is used in more domains and is spoken by more speakers, *COMPETITION* means no more than how unequally coexistent languages are often ranked by the population(s) associated with them in the “spacetimes” in which they are used.⁶⁹ The ranking is social, having little if anything to do with their particular structures, but everything to do with socio-economic and political power and social attitudes, and evidently with the social benefits that are derivable from speaking one or another language in particular domains associated, for example, with the particular kinds of jobs one aspires at, the particular social positions one would like to hold, one’s shopping practices, or one’s activities in other public spheres, in one’s neighborhood, and at one’s home, especially when the spouses or partners have different ethnolinguistic backgrounds in the latter case.⁷⁰

69 We determined in Mufwene & Vigouroux (2012) that Wallerstein’s (2004) notion of *SPACE TIME* (sometimes reproduced as *TIME SPACE*, as in Vigouroux 2009) may be more suitable than the traditional ethnographic notion of *SETTING*. It captures more adequately the fact that a place is conceived of more accurately as shaped by the population evolving in it at a specific time in its history.

70 I focus on speaking in this essay because it is in spoken, rather than in written form, that a language maintains its vitality. Experts in dead languages can write them without bringing them back to life. It is not clear that Classical Latin may be considered a living language simply because the Vatican’s curia can still speak it as a *lingua franca*. Perhaps keeping a language alive has to do especially with using it in more than a restricted ethnographic domain, including socialization/enculturation at and/or outside home. The latter condition is true of, for example, French Creole in Martinique and maybe also in Guadeloupe, both overseas departments of France, where parents refrain from speaking it with their children, encouraging them to become French vernacular speakers. However, children learn it passively from hearing their parents talking to each other (in their presumably secret or intimate code) and activate this passive competence in socializing with slightly older peers, especially during their teenage years. Those of them who wind up in metropolitan France in their adult lives even experience more pressure to speak *CrJole* as an identity marker, especially when they feel treated as outsiders. Thus, Hazael-Massieux (1999) need not have feared the endangerment of French Creole in these overseas departments of France, at least not now.

Competition arises from the choices that speakers face; and it need not be resolved in exclusive terms, with one language driving its competitors out. Often, the outcome is an ethnographic division of labor between at least some of the competing languages. This may be observed in Africa, where European languages, spoken primarily as *lingua francas* within the elite class (though a small proportion of these also use them as vernaculars, especially in South Africa), are restricted to ethnographic domains introduced by the colonial regime but seldom in those that are traditional to indigenous cultures. (This is especially true for the majority of speakers, who use them with varying degrees of fluency.) Thus they are used in the modern education system, though more and more countries are endeavoring to use indigenous languages in (the lower, first three years of) primary school, in (higher level of) public administration and of the economic sector, and in the higher court system (Mufwene 2008).⁷¹

SELECTION is thus the way that competition is resolved, through the agency of speakers, either in associating particular languages with specific domains (though the division of labor is not always clearcut!) or in letting one language prevail in all domains, as within dominant, mainstream populations in European settlement colonies, including those that produced creoles. The selection process need not be conscious, as speakers typically focus on communicating in ways that are beneficial to them, even when this simply means being understood,

71 Proselytizing has typically taken the other option, except in the formation of the intellectual leadership, because the cause of spreading a particular faith, such as Christianity, is served more expeditiously in the language of the population targeted by the proselytizers. In plantation settlement colonies of the Americas, in which the slaves constituted the overwhelming demographic majorities, things did not proceed this way simply because there were too many languages spoken each only by small proportions of the total populations in the plantations spacetimes. However, in exploitation colonies of Africa, missionaries typically identified an indigenous language that had wide currency in a region and adopted it for their mission.

without foresight of how the choices they make language- or feature-wise affect the future of their language(s). In some drastic cases of social conflicts, as has happened in some Central European territories, the competition is resolved politically by dividing what used to be the same countries into separate countries that each become constitutionally monolingual.⁷²

I should also explain at this point that I speak of “evolutionary perspectives” in this essay because matters of language vitality, including birth, maintenance, and loss fit in the proper domain of language evolution and “evolutionary linguistics,” as explained in Croft (2008), Mufwene (2013), and McMahan & McMahan (2013). Evolutionary linguistics should be concerned not only with the emergence of structures and architecture of languages and with their speciation in documented history, but also with various aspects of their vitality, indeed on the model of evolutionary biology, more specifically macroecology, in which various ecological factors are invoked to account for the changing dynamics of ecosystems. Linguists interested in language vitality in situations of population contacts, thus of language coexistence and competition, are concerned with the changing dynamics of ecosystems in which languages belong and therefore with one facet of language evolution.

What this essay is not concerned with is one branch of the scholarship on language ecology, identified by its practitioners as “ecolinguistics,” which has capitalized on linguistic diversity (e.g., Couto 2007, 2009) and often promoted advocacy for endangered languages (e.g., Mühlhäusler 2003). Although I believe that highlighting linguistic diversity and its

72 To be sure, this characterization is not completely accurate, as it was typically assumed or claimed before the separation that the then politically unified populations had spoken the same language, variable though it was. From the point of view of the sociology of language, one may argue that the separation has simply promoted the different varieties to the status of separate languages, as is evident from the creation of academies intended to make them more different than they used to be.

usefulness to humanity is only a derivative of language ecology proper, I want to state unequivocally that linguistics will be very much enriched by learning the extent to which linguistic structures, especially within the lexicon, are shaped by the social and non-social ecologies in which particular languages evolve, what Couto (in press) calls “natural ecology.” This includes the faunas and floras in which their speakers evolve, as well as their socioeconomic organizations. Although I have argued that languages emerged in mankind to serve as means for rich and explicit communication beyond our animal mind-reading capacity (Mufwene 2013), I also submit that languages would not function adequately as communicative systems if they did not also evolve as representational systems reflecting cognitive organizations significant to the populations speaking them. These cognitive categories impose culture-specific meaning-packaging chunks in the ways languages function as communicative technology, beyond some universals in the general architecture of the technology.

2. Whorfianism and the “cascade of ecological determinisms”

These considerations about how languages vary from one culture to another in the ways they package information, reflecting in part their “natural ecologies” (Couto, in press), are in fact where ecolinguistics overlaps with the ecology of language as I conceive of it. Mufwene (in press) and Mufwene & Vigouroux (2012) speak of a “cascade of (partial) ecological determinisms,” which accounts for the differential evolution of European languages in the colonies. What we tried to highlight is the fact that the colonization of the world by Eu-

rope from the 15th to the 19th centuries was driven by economic considerations, which were subject to climatic considerations. For instance, it is not by accident that colonies that thrived on sugarcane cultivation were concentrated around the tropics, on islands and in coastal areas, where sugar cane can be cultivated successfully. The tropical temperatures were found suitable, in places where the vegetation is not arid and a minimum of twelve inches of rain water per year was guaranteed. Otherwise, an affordable irrigation system was developed, as in colonial Haiti.

When, a century after sugarcane had been exploited successfully by small farmers in Brazil, Caribbean planters not only adopted this industry but also decided to revolutionize it by developing huge plantations with enslaved laborers, they also found it necessary to impose a racially segregated population structure soon after the latter became overwhelming demographic majorities, in order to control the circulation of weapons and prevent possible insurrections (Wood 1974). This socioeconomic evolution was unlike in Brazil, which, despite having many more slaves than all the Caribbean colonies combined, spread its slaves over numerous small farms in which they remained minorities and assimilated with European indentured servants.⁷³ Consequently, while the Caribbean wound up with a segregated population structure, which favored the emergence of creoles among the slaves, Brazil maintained a racially-integrated population structure, though it was economically stratified, which did not produce a Portuguese creole. As explained in Mufwene (2001, 2005, 2008), segregation of populations and rapid population replacement appear

73 According to Schwartz (1985), Brazilian small farmers relied on cooperation with neighbors in scheduling harvesting and processing the crop at mills that they shared but could not afford to own individually, unlike on the large Caribbean plantations, which developed into self-sufficient industrial estates.

to have been more critical ecological factors in the emergence of creoles (by structural divergence from the colonial variety spoken by the White colonists) than the traditionally-invoked demographic disparities of 20% Europeans vs. 80% African slaves. As a matter of fact, these demographic disparities did not obtain in many colonies that produced creoles, for instance, Barbados.

Segregation and rapid population replacement appear to have applied also in Cape Verde, which produced a creole, though it had no viable sugarcane cultivation nor even any other kind of agricultural industry requiring large slave population in permanent residence. It functioned as a slave depot preparing slaves for their exploitation in Brazil, though race segregation was apparently imposed in order to control effectively the population of slaves that, though largely transient, always constituted the overwhelming majority in relation to the European and Creole population. In the case of the Netherlands Antilles, an additional factor was the geographical isolation of the slave population from Brazil (a form of segregation!) after Portuguese had been kept as their vernacular and would be in contact with Dutch, the language of the colonizing nation, and Spanish, spoken in the neighboring territories. Just as ecology is said to roll the dice in biological evolution, languages also evolve at the mercy of the socio-economic ecologies in which they are embedded, though these also depend on the geographical ecologies (consisting of climate and soil) that enabled them.⁷⁴

⁷⁴ More interested readers are encouraged to read Mufwene & Vigouroux (2012), in which Wallerstein's (2004) notion of *SPACE**TIME* (see also Vigouroux 2009) is borrowed to shed more light on the dynamic interactions of space and time in the construction of population structures. To make more sense of all this, one must embrace the social geographers' position that space shapes society as much as society shapes it, as also suggested by the "niche-construction" theory (e.g., Odling-Smee *et al.* 2003). Thus, from the point of view of language evolution, the Caribbean differed from Brazil

3. The significance of INDIVIDUALS and POPULATIONS as ecological factors

All the ecological factors I have discussed to this point are not only external to language but also indirect. They do not work directly on language but on the populations of individuals that speak them. We can say that individuals, working each in their own respective interests for survival in or adaptation to the new socio-economic ecologies, react to the new ecological pressures in ways that “maximize their fitness,” making them more adaptive. Everything being equal in their ecologies as explained above (though this was not always the case, Mufwene 2008), a whole lot of how speakers behave depends on their learning skills and their motivation in particular (see also Mufwene & Vigouroux 2012).

Thus, one cannot claim to approach language dynamics and evolution ecologically without factoring in the **SPEAKER** as the most direct external ecological factor to language, as he/she contributes variation to the emergent, ever-evolving language and participates in: 1) the spread or elimination of variants through the selections he/she make from among the competing variants (be they languages or linguistic features), 2) the emergence of new norms, and 3) sometimes the emergence of new varieties. Speakers operate within specific population structures, which constrain who they can(not) interact regularly with, and when they can(not) accommodate the practices of other speakers and thereby converge with or diverge from them. However, there would be no population

by the particular social practices that fostered race-based language speciation within the former’s colonial population but not in the latter. We must also remember that even in places where race segregation was institutionalized, the colonial languages did not evolve uniformly among the slaves. Creole continua date in fact from the early days of the emergence of creoles.

structure to speak without the ontologically prior existence of individuals, who must be organized in some ways for the survival of the whole, even when the social organization means the exploitation of a subgroup by another.

We must definitely make sense of the complex dynamics of inter-individual and inter-group interactions in order to understand how structures of languages evolve toward new norms, how they speciate, and how they maintain or lose their vitality. Note that even inter-group interactions presuppose inter-individual interactions on patterns that are typically dyadic or triadic (Mufwene 2008, Mufwene & Vigouroux 2012). Although the possible algorithms for making sense of these dynamics are complexified by the fact that the interlocutors often change, we can assume that there are some speakers who interact with each other regularly enough to generate convergence of small-scale norms within networks and communities of practice (Lave & Wenger 1991, Eckert & McConnell-Ginet 1992). On the other hand, as noted in Mufwene & Vigouroux (2012: 123), “The community of practice alone will not account for all aspects of language practice. It must be complemented by an ecological, albeit ethnographic, approach that highlights how language practices are shaped by and in turn construct the physical space in which they occur.”

As networks and communities of practice overlap, through individuals that participate in more than one network or community of practice, larger-scale norms associated with towns, cities, regions, or nations can emerge, though norm emergence does not at all entail that such populations become linguistically uniform (Mufwene 2001ff, Mufwene & Vigouroux 2012). As speakers have different interactional histories and are subject to various other ecological pressures (notwithstanding differences in their learning skills), there will always be variation among them.

When they also diverge between populations or communities of practice, the extrapolations projected from such emergent norms have traditionally been characterized as dialects or languages, depending on the ancestry of the varieties and/or political attitudes. Such differential evolution may be illustrated with the speciation between Peninsular and Brazilian Portuguese, or between different modern English varieties, or between the language varieties called creoles and their Indo-European lexifiers. But such inter-group variation has also been identified intra-nationally between different regions, such as between different dialects of American English, of Jamaican Creole, or of Haitian Creole. Archipelagos must have naturally favored such differential evolution, especially at times when mass cross-island transportation was not as regular and affordable as it is nowadays. Archipelagos embody discontinuous geographical spaces and their inhabitants have interacted more regularly among themselves, on their respective islands, than with those on other islands. This is confirmed by the emergence of various dialects of Cabo-Verdiano in Cape Verde (Baptista 2003).

Population structure can also produce what Couto (in press) calls “language islands,” according to himself, what has been traditionally identified as “language enclaves.” He explains them as minority languages spoken by populations surrounded geographically by speakers of a dominant language, such as pockets of Native American languages still spoken in parts of Brazil, while the nation is evolving toward monolingualism in Portuguese as a vernacular. Another kind consists of languages spoken by immigrant populations that have remained together, largely isolated from the host population and have resisted adopting the latter’s language as their vernacular. Couto’s examples include German used as a vernacular in countries where it is not the dominant language (such as Hun-

gary, Poland, and Romania, among other European nations). There have actually been many such cases in recent colonial history, such as German in rural Wisconsin (Salmons 2003, Wilkerson & Salmons 2008).⁷⁵ I am sure this was the case for many other European languages that died before German in Anglophone North America. If this characterization does not apply to Francophone Quebec (but cf. Chaudenson 2008), it certainly applies to other, smaller Francophone communities in the North America.

We must bear in mind that language islands presuppose social islands, pockets of populations isolated from majority populations that surround them. Like geographic islands, which can be connected to mainlands by bridges or boats or canoes, social islands need not be isolated. In the language of macroecology, they can be connected to majority or mainstream populations by “dispersing individuals” (Hanski 1996), though this notion has been conceived of on the assumption that large populations consist of discontinuous “habitat patches.” Here again, we are brought back to the role of individual speakers, whose social practices bear on how the languages of their communities evolve. Dispersing individuals can introduce elements from outside that can affect structures of their heritage languages, especially if such individuals are influential or numerous. They may also introduce some bilingualism, if they introduce economic or other kinds of activities that operate in the outside language, such as trade or popular culture.

But a good proportion of the dispersing individuals may also be associated with exodus from home, in search of better economic opportunities. Such population movements

75 I will deliberately ignore “language isolates,” which are genetically defined, from this discussion, although much of what applies to the vitality of language islands applies to them as well.

may erode the vitality not only of an island population but also of its language, especially when there is massive emigration in favor of a territory that is economically more affluent. Those natives who return “home” later speaking only the language of the demographically and/or economically dominant population likewise erode the vitality of their heritage language. Native American populations in the USA have very much been affected by such population movements since the 19th century, especially also with the expansion of populations of European descent into their reservations (Banner 2005). Hitherto isolated Native American populations in Brazil are now having similar experiences too (Ball, in press; Moore, in press).

Exogamy is another ecological factor that can be associated with population structure, just like education outside one’s heritage community, where social segregation is not rigid. It is thus that several European immigrants to the Americas and Australia have shifted to the dominant European vernacular of the destination colony. In industrialized nations, the assimilation of island populations to cultures of the dominant populations has typically entailed loss of their heritage languages. An interesting research topic suggested by Couto (in press) is what particular factors are likely to obliterate (the cultures of) island communities and thereby endanger island languages.

As argued in Mufwene (2001), individual speakers are ultimately the “unwitting agents of change”; they roll the dice of language evolution through their interactional and communicative practices. They filter all the ecological pressures exerted on their populations, deciding which particular responses “maximize their fitness.” Their populations and respective languages suffer the consequences incrementally, depending on how fast and widely new trends spread within them.

4. The MIND as an ecological factor

There is one other important ecological factor whose significance is underscored best by the phylogenetic emergence of language, viz., (the emergence of) a human-specific mind that is capable of processing and storing a lot of information, as well as of producing or learning modern human languages. The evidence from inter-individual communication among humans and between humans and animals suggests that only humans can learn the language(s) of their social environment and, for that matter, the language of any other human population that they are interested in interacting with. Animals are typically unable to learn not only human languages but also means of communication that are specific to other animals even within the same genus. For instance, adult song birds cannot learn to sing like song birds of a different species, whereas adult humans can still learn to speak the language of another population, although hardly with native competence.

The topic is more revealing regarding communication between humans and non-human animals. As usually reported in the literature, the other animals that manage to understand bits and pieces of human languages, and even those that can mimic them (such as Alex the African gray parrot), can only do so in a very limited way. Communication is generally limited to their survival needs but barely at all for simple needs of socialization. Adult animals hardly match the communicative and socialization capacity of a two-year-old human child. However, what has received less attention is the fact that, although we are as good at reading the minds of other animals as they are with ours, no humans have been reported yet to communicate with animals in the latter's means of communication. The lesson appears to be that both parties are severely constrained as much by their anatomies as by their mental

specificities from learning means of communication that are associated with other species. Humans can learn each other's languages across ethnolinguistic populations because they belong in the same species, are endowed with similar mental capacities specific to humans, and have fundamentally similar communicative needs.

A critical ecological factor in communicating in a human language is being endowed with a modern human mind.⁷⁶ As argued in Mufwene (2013), this has that has enabled us to produce modern cultures largely in response to pressures that hominines have experienced to share their feelings and knowledge about what Couto (in press) identifies as our “natural ecologies,” as explained above. In return, linguistic communication has enabled both individuals and populations to increase their knowledges, often saving each other time in not having to re-invent the wheel and accumulating more information collectively. Thus languages around the world have enabled hominines to cooperate and collaborate toward their survival in the face of changing “natural ecologies” to which we have had to adapt. Learning from each other through language has reduced cases of “reinventing the wheel” and reduced fatalities among us, as we are not equally gifted at solving various problems. It has also expedited the solution of problems, especially through the collective and gradual invention of

76 I insist more on the mind than on the anatomy, because, as explained in Mufwene (2013), the former domesticated the latter, phylogenetically favoring speech and saving signed language as a fall back option. The reasons are numerous, though a critical ecological factor typically overlooked in accounts of why speech has been favored is the fact that deaf people have hardly lived in separate communities of their own, or in ones where they could interact with each other regularly enough to develop a sign language (different from idiosyncratic home signs to communicate with speakers). What we also do not know is how many sign languages may have emerged in hominine phylogeny that did not survive for the same population-structure reasons. We must also bear in mind that the languages spoken today are only very remotely connected phylogenetically to the first full-fledged modern languages that emerged some 50-30 kya, according to some estimates (Mufwene, to appear).

technology. This human-specific capacity to communicate, no evidence has been reported of it among other animals, not even those that have been trained to communicate with us. It also holds the key to language change and various aspects of language vitality.⁷⁷

The mind is home to the coexistence and competition of languages (Weinreich 1953). It determines whether the different linguistic systems a speaker develops remain separate and intact, or whether they become contaminated by each other, apparently for reasons of economy of memory space in information storage (Mesoudi 2011: 31). It also responds to external ecological pressures of communication regarding which language to use and how it must be adapted to each communicative event. It is the patterns arising from its responses to communicative pressures that roll the dice on the fate of the languages that the speaker knows, viz., whether or not their structures change and how, and whether they thrive or suffer from atrophy (what linguists have traditionally called “attrition”) and may eventually die. At the communal level, which is the focus of historical, genetic, and evolutionary linguistics, language change, language speciation, language maintenance, and language loss are the ultimate outcomes of the cumulative behaviors of individual members of a population. Although there are often intentional institutional interventions to determine or control various aspects of language evolution (such as with the creation of academies), we all know that such attempts have typically either failed or not been as successful

77 Putting the whole evolutionary scenario in perspective, it is debatable whether it is language that makes us uniquely human. It looks like the credit should go to the human mind, which has produced not only human languages but also various cultural practices that are specifically human, concurrently with languages. It is even debatable whether linguistic anthropologists should continue speaking of “language and culture,” since languages themselves appear to be cultural productions, regardless of the role human-specific biology in their emergence (Mufwene 2013).

as planned, because speakers contribute to the evolutionary trajectories of their languages unwittingly through the usual deviations associated with “learning with modification” in studies of cultural evolution, unaware of the ultimate consequences of their behaviors. Also, the occasions when speakers reuse the same words or phrases are not always identical to previous ones, which can trigger new evolutionary trajectories. In any case, speakers typically notice changes affecting their languages or their own loss of competence in some of them long after they have repeatedly contributed to these cumulative outcomes of their behaviors.

5. The internal ecology

The facet of the ecology of language that I have said nothing about so far in this essay is what I identify as “internal ecology” in Mufwene (2001, 2005, 2008). This has nothing to do with the traditional distinction between externally and internally-motivated change in historical linguistics. Historical linguists have typically associated externally-motivated change with language contact and treated every other change as internally-motivated. This tradition suggests either that languages have histories which are independent of the agency of their speakers, or that speakers in an ethnolinguistically unmixed population should not be separated from their languages. Both inferences are untenable in ecological approaches to language. To be sure, what historical linguists have had in mind is simply to consider as internally-motivated those changes that originated within the population of native speakers independent of influence from outsiders. Thus, if the grammar of the standard or written variety of a language changed simply because attitudes to nonstandard elements had changed and the elite

stratum of the population had become more tolerant of some nonstandard features, the change was internally-motivated. The account would also be the same if population movements within the national boundaries of an ethnolinguistically un-mixed population produced structural changes resulting from new patterns of contacts between and mutual influences from its dialects. In contrast, I submit that, since the speakers themselves are not part of their languages, though they trigger changes in the structures and vitality of their languages through their communicative behaviors, all language changes are externally-motivated.

On the other hand, changes are also largely determined by the composition of the feature pool of a particular language, which avails structural materials that can be coopted for new functions and in which variants stand as ecologies to each other (Mufwene 2001, 2005, 2008). In phenomena such as grammaticization, nothing happens that is not licensed by the extant grammar. For instance, while functioning as a semi-auxiliary verb in *Is Paula coming with us?*, the verb *go* in English continues to behave as a motion verb inflected in the progressive in the present tense, modified by its own copular-auxiliary *be* inflected in the 3rd person singular. Although it is used as an auxiliary, it is blocked from the Subject-Auxiliary Inversion rule. This usage diverges from the more traditional usage pattern of the motion verb *go* in that its complement is a verb in the infinitive and only the complementizer *to* can be used between it and its complement. Thus the grammatical change undergone by the verb *go* to also function as a semi-auxiliary verb is very much determined by the internal ecology that the extant grammar of English already is.

Likewise, in Gullah, the English creole spoken on the coast of South Carolina and Georgia in the USA, the morpheme *fuh* 'for' functions as an obligation modal in the construction

Robert fuh come see me ‘Robert has to/must come (to) see me’ simply because the preposition *fuh* can also be used predicatively without a copula in a construction such as *dis book fuh me* ‘this book [is] for me’, unlike in English. One can even argue that it remains a preposition even in this derivative grammatical function, though its complement is a verb, rather than a noun, in this case. Similar considerations apply to verbs that have evolved into auxiliary verbs in syntactic environments in which they could take verbal or clausal complements. Although their specialization has led them to behave differently from other transitive verbs in English (especially regarding contraction, the Subject-Auxiliary Inversion, and the ability to combine with the negation marker *not*), they continue to behave like other verbs in the Romance languages. The case of articles is also worth mentioning here. While in some languages they have evolved from demonstratives or the quantifier ‘one’ in the case of the indefinite article, they have also continued to hold the same syntactic position as their etyma, unless a subsequent change, also consistent with other phenomena in the language, caused them to change positions. In languages such as French, it is not always clear whether it is the quantifier or the article *un(e)* that is used. In all these cases, the extant grammar of the relevant language functions as the internal ecology determining how extant materials can be co-opted, or exapted, for new functions.

Other changes can occur because an alternative way of expressing the same meaning is preferred to another, such as the use of the auxiliary verb *avoir* ‘have’ or *être* ‘be’ with the main verb in the past participle, instead of only a verb inflected in the ‘*passé simple*’ to convey PAST tense in modern French. Regardless of whether the trigger of the change was contact of the French population with speakers of other languages using this periphrastic strategy (see Heine & Kuteva 2005 regarding

areal linguistic features), the fact is that the alternative that has prevailed was once a variant of the one that has been abandoned.

In some other cases, some sort of compromise is found between the competing variants. Thus, the tense auxiliaries *will* and *be going to* have specialized in the kinds of FUTURE they express in some dialects of English, with the latter associated with INTENT or DETERMINATION, while the former is more neutral. Dynamics within the system of a language are more complex than illustrated with these few examples. The point was simply to show that every language has an internal ecology that influences how it evolves, going all the way to how it allows foreign elements in. It is in this context that I introduced the notion of FEATURE POOL in Mufwene (2001).

6. Final remarks

It is difficult to account for historical and phylogenetic aspects of language evolution without invoking changes in the ecology of human communication, regarding whether these are caused by changes in their mental capacity and/or social organizations, by population contact, or by simple population dispersal, which can entail an unequal, non-uniform distribution of variants between the allo-populations. As explained in Mufwene (2013), changes in the hominine mental capacity, undoubtedly compounded with population growth, exerted a lot of ecological pressure on our hominine ancestors to develop more efficient and explicit communication technology, which has culminated in modern human languages. Regarding population dispersal, I also argued in Mufwene (2008) that changes in the distribution of variants affect the balance of power among them and can set in motion new dynamics of

usage that can produce change and sometimes language speciation.

Offsetting the balance of power among variants is also one of the things that language contact, an important ecological factor, can do, such as in favoring some variants over others, under the influence of the other language(s) that a particular language comes in contact with. For instance, in the emergence of creoles, contact between the European lexifier and substrate languages with isolating morphosyntax has typically favored periphrasis over inflections, especially in the expression of TENSE and grammatical PLURAL, as in the case of *dem bin talk* ‘they talked’ and *di book dem* or *dem book* ‘the books’ in several English creoles. Although a large proportion of this essay was devoted to what Couto (in press) labels as “natural ecology” of a language, especially its population structure, one cannot at all ignore the significance of individual speakers as the ultimate and most direct ecology of a language. They are the unwitting agents of changes not only in its structures but also of its vitality.

The mind remains the most important driver of evolution, as it filters all influences from outside and within the speaker. This is evident even in incipient pidgins, which, while reflecting drastic changes in the structures of the lexifier, remain human languages nonetheless. They maintain a fundamental character of the architecture of languages in being compositional from sounds to words and from words to sentences, and in preserving what Hockett (1959 and Martinet (1960) (mis) identified, respectively, “duality of patterning” and “double articulation.” They also exhibit some grammar, however primitive this may be, as at least they maintain a distinction between nouns and verbs, they resort to demonstratives and quantifiers to specificity reference, and they have predication, regardless of whether or not the relevant word order is variable. Acting

as a critical ecological factor, the modern human mind of the contact populations has prevented the lexifier from disintegrating completely, *pace* McWhorter (2001).

I cannot conclude this essay without underscoring the fact the ecology of language is also relevant to synchronic linguistics, especially regarding the ethnography of communication, to which a great deal of Mufwene & Vigouroux (2012) is devoted. We highlighted the fact that, within the limits of his/her competence, a speaker is a dynamic agent that adapts his/her linguistic behavior to varying communicative interactions, always adjusting to current ecological pressures as lived in the present. In the final analysis, one must realize that although speakers reflect the history of their language(s) and their own personal interactional histories, they shape the ongoing history of their language(s) through how they use it on different occasions to meet their respective communicative needs.

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