Introduction

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DOI
10.1075/coll.59.01abo

Publication date
2021

Document Version
Final published version

Published in
Variation Rolls the Dice

CHAPTER 1

Introduction

Ecology rolls the dice

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1. An ecological approach to Salikoko S. Mufwene's intellectual journey

This volume honours Salikoko S. Mufwene's influential contribution to the study of language, and in particular, to creolistics. The title, *Variation Rolls the Dice*, echoes Mufwene's stance that "ecology rolls the dice" in accounting for the competition-and-selection of linguistic variants. This title is also a way to encapsulate what we may learn from Mufwene's life trajectory, his intellectual endeavour, and how his specific life and academic choices contributed to making him the iconoclast scholar he has become.[1] Indeed, Mufwene's academic path as an undergraduate in his native Zaire (i.e., present-day Democratic Republic of the Congo), a graduate student at the University of Chicago, and a faculty member in different universities in the Americas has been one of competition-and-selection. His experience as a sub-Saharan African multilingual speaker-learner of typologically distinct languages with varying degrees of social prestige has profoundly shaped the questions at the core of his research programme. For instance, how can the study of language and its contexts of use help to uncover underlying properties of speaker/signer-learners' (henceforth S-learners') linguistic repertoires, and their instinct for language? How can we account for S-learners' language capacity based on their ecology? How does a comprehensive formal account inform us about the emergence of new languages (e.g., creoles) or shed light on speakers' choice of (or

1. See more on this in the postscript to this volume, "The restructuring of Salikoko Mufwene through competition and selection: A conversation between Salikoko Mufwene and Michel DeGraff".

https://doi.org/10.1075/coll.59.01ab0

shift to) a language in particular ecologies? How do all these questions, examined from the ecological perspective, shed light on the human mind/brain and on how humans evolved such a unique trait: language?

Sali, as he likes to be called by his students, colleagues, and friends, grew up speaking Kiyansi, the language he spoke at home in his village in the Bandundu province of Zaire where he was born, and Kikongo, the dominant language of the region. Like all the pupils attending school in the Belgian exploitation colony of pre-independent Congo, he received his formal education in French in Catholic primary schools and at the seminary.[2] After independence, the educational policy of providing schooling through the medium of French in Zaïre and more generally in former African exploitation colonies stayed in place – a policy which obviously continued to coerce sub-Saharan populations to access formal education through the language of the former colonial power. This language policy has benefited a small elite that (still today) operates transnationally between the African continent and the Western world, whereas the majority of the African populations functions mainly in their vernacular and vehicular languages (see Mufwene 2008).

At the then *Université Nationale du Zaïre* in Lubumbashi, Mufwene learned a "bookish English" (mostly taught by non-native instructors) when he was preparing his *License en Philosophie et Lettres* (BA in Philosophy and Literature) with a major in English Philology. Thanks to a Fulbright scholarship, he pursued a PhD in formal semantics at the University of Chicago under the supervision and mentorship of the late James D. McCawley. He received his linguistics training while adapting his "bookish" L2 English to real-life interactions and absorbing various aspects of the English varieties he was exposed to. At this point, he must have realised that there was a gap between a constructed standard, neatly presented in books taught by L2 teachers to non-native learners thousands of miles away, and what native speakers do with their languages, sometimes in plain "violation" of the neat and unchallenged rules displayed in the prescriptive grammars from which he had learned. He must also have recognised how individual native speakers' language practices and attitudes to their language varied. Most of all, he must have concluded that speakers, whether speaking a socially valorised language such as English or a stigmatised vernacular such as those spoken in his native Congo, are equally subject to the various pressures of their respective ecologies. Indeed,

2. In colonial sub-Saharan Africa, Catholic schools were believed to be the best for training Africans to become "educated" and suited to work in the colonial administration. Sali, like many other children of caring parents, was sent to the seminary because, his parents believed, this would be the best way to secure his future. Well, Sali was born an iconoclast. An anecdote he often tells is that he was expelled from the seminary for asking too many questions!

by socialising with other Congolese students in the Chicago area, he acquired Lingala, a Congolese vehicular language. Peer pressure was an important ecological factor that drove him to learn the language.

Through his language journey Mufwene has experienced first-hand how S-learners' vehicular languages may change during their lifetime under the pressure of different ecological factors, and how these, in turn, may affect their linguistic behaviour in both comprehension and production. He understands the emotional toll that language attrition may take on speakers, especially when they interact with close relatives left behind. He is attuned to how language ideology shapes people's linguistic behaviour and representations: as a child he was subjected to the psychological and physical violence of being taught in the language of the former coloniser at the expense of his native Kiyansi or Kikongo. He knows how speaking a foreign language (i.e., French or English) "with a unique accent" (hard to be localised by American English or French native speakers, as well as by other L2 speakers of the Diaspora) may lead to disenfranchisement and discrimination, independently of one's actual competence in those languages, one's integration into the community, or one's socioeconomic status and cultural capital. He is aware that language indexicalities do not remain the same across contexts. Lingala, commonly associated with the former Mobutu regime in Zaire and the derided way of living in the capital city, Kinshasa, became for him a new index of his "Congoleseness" in the United States.

Mufwene's life experience has partly motivated his commitment to developing a more comprehensive theory of linguistics that focuses on the interactions between the individual S-learners (more precisely their minds) and their ecologies. The importance of Jamaica as an ecological incubator for his subsequent research on creoles cannot be downplayed here. As a newly appointed assistant professor at the University of the West Indies, he embraced a new line of research thanks to the mentorship of colleagues like the late Mervyn C. Alleyne. In this new ecology characterised by diglossia, he witnessed the ways in which S-learners interacted by using a continuum of linguistic variants. He recognised the challenges that creolistics poses to linguistic theory in general. Since then he has dedicated his academic life to unsettling and debunking deep-seated language theories, including those in creolistics.

2. Mufwene's language ecology approach

Mufwene has often acknowledged the influence of Robert Chaudenson's historical approach on his ecological perspective, especially regarding the importance of socioeconomic structures of the *settlement colonies* in which creoles emerged

(see Mufwene 2001).[3] In Mufwene's ecological approach, one cannot understand S-learners' language practices if one ignores the specific ecologies in which they are inserted and have evolved. Regarding creoles, this approach entails analyzing their linguistic properties in light of the sociohistorical, political, cultural, and economic factors that fostered their emergence. Mufwene's keen interest in understanding these properties and integrating them into a comprehensive theory of language evolution led him to translate into English and edit Chaudenson's original French book, *Des îles, des hommes, des langues* (Chaudenson 1992). This revised version made Chaudenson's work available to a broader readership, as Chaudenson himself acknowledges in his (2001b) article "Focus on creolist: Salikoko S. Mufwene". Furthermore, Mufwene's reinterpretation of Chaudenson's work made it clear that "Creolisation", a term that linguists now use exclusively to characterize the development of a new language from a pidgin (see the so-called Pidgin-to-Creole Cycle, Hall 1962), involves minimally three factors: space (i.e., a settlement colony), time (seventeenth eighteenth century colonial expansion), and people (i.e., linguistic and cultural agents in contact). These three factors explain why creoles (e.g., Jamaican Creole, Haitian Creole) may appear more distant from their British English and French lexifiers, respectively, than, say, American English and Quebec French. Although the cognitive processes that S-learners of these languages are subject to are the same, their ecologies are not. A fundamental aspect of Mufwene's uniformitarian approach to the evolution of language is that the cognitive processes that led to the emergence of so-called creoles are not different from those at work in other language change processes (e.g., from Latin to French). The modern mind is the same across modern human populations. Therefore, the relevant explanations for observable differences are found in S-learners' respective ecologies (Mufwene 2001). According to this line of thought, the "distance" between French and Haitian Creole is not more striking than that between Latin and French. In both cases, the feature pool (i.e., the inputs to which language learners are exposed and which trigger learning) defines the range of variation (see Aboh 2015; Aboh & DeGraff 2016; Mufwene 2001).

With regard to language change and linguistic typological variation in general, Mufwene has also credited Voegelin, Voegelin & Schutz (1967) and Haugen (1971, 1972) for his ecological approach to language evolution. This model, based on population genetics and macroecology, takes as its premise that a biological approach to evolution is also applicable to languages. The evolution of language is

3. At the time of writing this introduction, we learned of the passing of the French creolist Robert Chaudenson, one of Mufwene's friends and intellectual companions over the past thirty years.

comparable to that of species (see also Croft 2000, and this volume). For instance, processes of POLYPLOIDIZATION and HYBRIDIZATION, which are relevant descriptive concepts for understanding variation within and across individuals, can be analogized to how a speaker may select, recombine, and incorporate different linguistic features into her/his idiolect. Breaking away from the Darwinian view that has been dominant since the nineteenth century, Mufwene argues that languages are better analogized to viral species (rather than organisms). According to him, both languages (as spoken by individual S-learners) and viruses owe their existence to their hosts, with the exception that in the case of language, it is the host who develops a mental grammar that translates into specific linguistic behaviour in communicative settings (Mufwene 2001, 2008, 2018). Although this marks a major difference between language and biological species in general, the analogy allows us to focus on a core aspect of linguistic theory: the ways in which individual S-learners affect each other through communicative acts that eventually lead to the emergence of communal norms (i.e., what Chomsky (1986) refers to as E-language).

However, Mufwene reminds us to use the biological analogy with caution, by underscoring that language phenotypes (i.e., features on which typological classifications are formed) are not equivalent to the genotypes of viruses. Unlike the latter, linguistic phenotypes are acquired in a piecemeal fashion through S-learners' interactional activities.[4] The latters' agency (and sometimes informed choices e.g., in the context of migration or relocation to a new neighbourhood) is crucial to the emergence of mental grammars that are put to use in communicative settings.

For Mufwene, therefore, the ecology includes different, though interrelated, factors that influence how a language evolves locally (i.e., in the mind of the individual S-learner, and at the population level). The mind and the anatomy of S-learners are, according to him, the most critical drivers of language evolution. It is a truism to say that without the development of the hominins' mental and anatomical structures, modern human languages (if they existed) would have evolved very differently from what we know today. However, most linguistic frameworks ignore this aspect. In studies of language contact, for instance, most discussion of contact scenarios is framed as if populations of S-learners meet as armies on a battlefield. Although particular events in history, such as the slave trade or other forms of forced migration, may bring large groups of people into contact with each other within a short period of time, and thus coerce the development of various

4. But see Aboh (2015), who adopts a stronger biological view in which idiolects can be considered to represent to some extent the phenotype of linguistic genotypes as recombined within individual speakers/signers.

L2-acquisition strategies, one should not forget that the mind is where language contact primarily occurs. It is where structural information is processed, competition-and-selection between different linguistic features happens, and recombination of linguistic features leading to new variants occurs. The task of the linguist is to uncover these processes and explain how they may become a "system" at both the individual and population levels (see Aboh 2015, 2020; Mufwene 2001, 2008; Mufwene & Vigouroux 2017).

Socioeconomic, cultural, and historical factors are, in this regard, essential features of the ecological model. In his work on French and English-based creoles, Mufwene draws our attention to POPULATION STRUCTURE and its interactions with economic practices. Likewise, he warns us not to undermine the importance of geographic ecologies, or territories, as they influence settlers' decisions to favour one type of economy over another, for example, sugar cane, tobacco, or cotton (and subsidiary plants such as aloe vera) in the case of island plantation societies in the Caribbean and the Indian Ocean. Although ecology drives language evolution in this framework, one should also pay attention to Chaudenson's (2001a) idea of PERIODIZATION. Regarding French-based creoles, it prompts us to examine how the colonists' economic decisions depended largely on the time of colonization, the availability of capital, and the potential world market interests (Mufwene 2017). Accordingly, the weighting of ecological factors varies in time and space (Mufwene 2018) and must be addressed from a global perspective; hence the discussion of issues of globalization in Mufwene (2002a, 2002b, 2008, 2015).

From a linguistic perspective, the kind of economy developed in a particular locality shapes the types of interactions that take place there (who interacts with whom), their spatialization (i.e., where people interact), their periodicity, and external constraints exerted on these factors. Mufwene's comparison between different plantation economies from the seventeenth to the nineteenth century, however, makes it clear that economic practices alone cannot explain the emergence of creoles in plantation settlement colonies, any more than slavery (or indentured labour) alone can. He takes the example of Brazil, which never produced a Portuguese-based creole despite being engaged in a sugar cane plantation economy and having slaves more than a century before the establishment of the French and English Caribbean settlement colonies. He argues that the population structure in Brazil produced a different linguistic outcome because, unlike the situation in other plantation-based colonies, residential segregation of slaves from the European colonists and indentured servants was not enforced there, despite the presence of clearly racially based discrimination. Further interdisciplinary research should shed light on which relevant ecological factor "rolls the dice" in each setting.

Regarding colonization, Mufwene (2001) argues that different types of colonies led to contrasting linguistic outcomes. Trade colonies that flourished in the

nineteenth century produced pidgins; nineteenth century exploitation colonies led to indigenized varieties of the lexifier (or colonisers' language); and creoles emerged in the settlement colonies of the late seventeenth and eighteenth centuries. This historical approach enables him to debunk the popular and persisting assumption in creolistics that pidgins are the ancestors of creoles, and to challenge some recent claims about creole types (based on pidgin ancestry) (Mufwene 2020). These new insights make it clear that the ecological approach Mufwene advocates has an explanatory power that is often missing in monolithic theories of emergence often mentioned in creolistics or textbooks (e.g., Derek Bickerton's (1984) language bioprogram hypothesis, Claire Lefebvre's (1998) relexification hypothesis, or Ingo Plag's (2008a. 2008b, 2009a, 2009b) interlanguage hypothesis).

The SPEED OF POPULATION GROWTH is another important ecological factor to pay attention to, as the colonies of Cape Verde and the Netherlands Antilles illustrate. In discussing these cases, Mufwene (2008: 39) hypothesizes that the "rapid population replacement in a steadily growing overall population" favoured the emergence of creoles in these territories (see also chapters in Muysken and Smith 2015 and references therein for a similar view on Saramaccan).

In addition to these external ecological factors, Mufwene identifies internal factors as well. INTERNAL ECOLOGY, in his terms, refers to the "dynamics of both intra- and inter-idiolectal variation within a communal system" (2008: 53). From an internal ecology point of view, competition-and-selection is a process inherent in the dynamics of language evolution. Every idiolect (i.e., the externalisation of individual S-learners' mental grammars) draws on a FEATURE POOL (Mufwene 2001) to which individual S-learners contribute variably. Unlike what occurs in the biological gene pool to which the feature pool is analogized, the transmission of a linguistic feature always involves modification and recombination that are particular to each S-learner. Likewise, linguistic features may have multiple sources. For instance, a process of competition arises in the feature pool when different idiolects (e.g., A, B, C) that generate the inputs have variants of the same feature, namely, sounds, morphemes, grammatical structures, lexical items, etc. Although the selection process entails making some variants dominant over some viable competitors, the process does not necessarily lead to the exclusion of all competitors that were selected against. Quite the contrary, many variants remain "latent/recessive" in the minds of S-learners and may become active again given appropriate circumstances (see Aboh 2015, 2017a, 2017b, 2019, 2020). According to Mufwene (2018: 82), therefore, linguistic changes also depend on the composition of the feature pool, which triggers alternative learning hypotheses that S-learners entertain. The feature pool thus defines the range of variation indirectly, even though one should not neglect the creativity of individual S-learners, and

their propensity for generating new variants that are distant from the features of the source languages forming the feature pool.

For Mufwene, external and internal ecologies bear equally on language evolution, and therefore analysts should not privilege one at the expense of the other: we need experts in each subfield to arrive at the level of granularity that this approach requires. For linguists, this view implies that they should step outside their subdiscipline, and engage fully in interdisciplinary collaboration with other fields within the humanities and in biology. In his empirical work, Mufwene uses Jamaican Creole, Gullah, French-based Creoles, and African American Vernacular as a test-bed, but his conclusions reach beyond these varieties as they inform us about language evolution in general.

One cannot embrace an ecological approach without paying particular attention to the social context in which this scientific endeavour takes place. Regarding creolistics, Mufwene has strongly objected to analyses of creole structures that were too influenced by their idiomatic translations into Western European languages. For the past four decades, he has continuously drawn our attention to the fact that the linguistic community, by characterizing the evolution of creoles as unnatural, abnormal, or exceptional, has not really emancipated itself from the late-nineteenth century social prejudices toward non-European populations (DeGraff 2003, 2005; Mufwene 2001). He has repeatedly called out the Western world's hegemonic interpretations and descriptions of language data from the Global South (Mufwene 2020). In so doing, Mufwene has been inviting us *to reopen the books*, as he likes to put it.

Thanks to some of Mufwene's colleagues and *compagnons de route*, we are inviting the reader to open this book by reflecting on some of the numerous issues that he has addressed in his work. The different perspectives the authors adopt here reflect Mufwene's call to be inclusive in our approach to language, while paying particular attention to details about individual S-learners and their ecologies.

3. The chapters of this book

In Mufwene's (2001) and Croft's (2000) ecological approach to language evolution, language change results from competition-and-selection in which some linguistic features or *linguemes* are selected against others, thus leading to new varieties sometimes relatively distant from the source languages. Although it is conceivable that biological factors like individual differences impact upon the competition-and-selection process, the fundamental questions that arise are what external (social, cultural, economic, historical, geographical) factors are at play, and how the interaction between them eventually determines the structure or social type of the emerging language.

Willam Croft's chapter in this book addresses this question on the assumption that social types constrain the types of contact (and therefore learning) situations in which S-learners find themselves. As a consequence, social and contact types constrain the evolutionary trajectory of languages. To understand this, Croft proposes a sociolinguistic typology of language contact that builds upon Trudgill's (2011) framework to which he adds social contact, social structure, and S-learners' attitude. He submits three socially defined language types: *esoteric*, *exoteric*, and *neogenic* languages. Esoteric languages are only used within a specific speech community. Exoteric languages, on the other hand, serve communication between different speech communities. Finally, neogenic languages emerge in the context of new societies with new identities. As Croft concludes, "each of these three types represent continua of language types that arise under different social circumstances and evolve with different types of linguistic structures and different combinations of linguemes from different speech communities that have been or continue to be in contact." In this view, pidgins are just one extreme type of exoteric language, while creoles represent the type of a neogenic language. Exoteric languages and neogenic languages belong to two different continua, and therefore cannot be seen as resulting from a developmental cycle like the commonly assumed Pidgin-to-Creole Cycle (see also Mufwene 2005, 2008, 2020 for a critique of this developmental scenario). Croft's sociolinguistic typology of language contact not only sheds light on the creole debate and the types of contact languages (e.g., mixed languages, lingua francas) but also provides new analytic tools for understanding the sociohistorical and linguistic complexity of language contact and change.

In this regard, a relevant distinction established by Mufwene (2001, 2002a), and already mentioned above, relates to how different forms of colonization (i.e., trade, exploitation, and settlement) have produced particular socioeconomic and cultural ecologies that eventually impacted upon the structure of the languages in contact, and their evolution. In Mufwene's terms (2001: 204), trade colonization (usually the earliest form of contact between populations) consisted of "sporadic contacts [...] restricted to a specific socioeconomic function, like exchange of commodities. Such contacts restricted regular access to the full lexifier and led to the development of pidgins."

Exploitation colonies (e.g., the mode of colonization of sub-Saharan Africa), were characterized by colonizers controlling the colony administratively and economically for the benefit of European governments and companies. Government representatives and company clerks sent to the various colonies only settled there for the term of their mission. Colonization led to two kinds of new language varieties which diverged structurally from their lexifiers: (1) those lexified by European languages (the indigenized varieties), and (2) those lexified by

languages indigenous to Africa. Settlement colonization was intended to provide "new homes" for the European colonists, who would recreate there parts of the Europe they had left behind. As a matter of fact, many colonial settlements in the Americas were named after regions, villages, or cities in Europe, unlike what occurred in African exploitation colonies. Settlement colonies, which led to the emergence of creoles, usually

> started with intimate interactions between the two parties. [Institutionalised] segregation was subsequent to the increase in the sizes of the European populations and the larger proportions of non-Europeans. Multilingualism led the Africans to adopt the languages of the groups in power as their vernaculars. These were restructured during the appropriation process. (Mufwene 2001: 171)

Gillian Sankoff's chapter on Tok Pisin and the history of language contact in Papua New Guinea is a meticulous case study of how trade colonization, followed by exploitation colonization, gave rise to different socioeconomic and cultural dynamics that favoured the emergence of the so-called South Pacific Jargon, the ancestor of Tok Pisin. Her contribution focuses on the Buang people in the Snake River Valley of Morobe Province. As Sankoff explains, she "appl[ies] a close-up lens to study how changes in the linguistic landscape brought about by colonization have been assimilated to the local cultural construction of the relationship between language and society."

Sankoff enlists Mufwene's insights to shed light on the history of Tok Pisin. She discusses how South Pacific Jargon resulted from trade in the early part of the nineteenth century, whereas the transition from a trade to an exploitation colony by the late nineteenth century led to the spread of pidgins, then to the emergence of urban vernaculars and nativized pidgins. While painstakingly documenting the history of these transitions, she also examines the intricate roles of socioeconomic and political factors, national identity dynamics, population movements and S-learners' linguistic capital in the spread of language-contact varieties like Tok Pisin. She highlights the fact that such linguistic expansion sometimes occurs at the expense of local indigenous languages – though Tok Pisin itself would eventually be considered "indigenized," as Mufwene has continuously argued in his work. Sankoff's chapter is a superb case study of such "indigenization" processes in parts of Papua New Guinea where she has done extensive fieldwork. Her chapter provides robust empirical support for an ecological approach as developed in Mufwene (2001), while pointing to the necessity of a typology of contact, as Croft advocates in his contribution to this volume.

In Croft's account, pidgins are distinct from mixed languages: the latter (but not the former) are a form of neogeny in which multilingual S-learners (of presumably equal social status) engage in communicative practices, including

code-switching/mixing, which may lead to new speech patterns. The latter may subsequently conventionalize to become a speech form shared by an emerging community with a new identity. It is reasonable to assume that similar communicative patterns contributed to the spread and nativization of Tok Pisin.

Carmel O'Shannessy's chapter on Light Warlpiri, a mixed language spoken in Northern Australia, is another case in point. Building on theories of code-switching/mixing (e.g., Meyers-Scotton 2003), she argues that insertional code-switching (Muysken 2000), whereby a verb phrase from Kriol (an English-based creole) is inserted into a Warlpiri's frame, accounts for the "mixed" structural properties of Light Warlpiri. In a way somehow indicative of the Saussurean systemic approach to language, this pattern triggers the emergence of other creative patterns within the verbal domain and at the nominal and clausal levels. These innovations exhibit aspects of all the source languages, including Warlpiri, Kriol, and English varieties that speakers are exposed to. Though the bulk of its syntax is modelled on Warlpiri, Light Warlpiri displays new grammatical properties not found in its source languages. As O'Shannessy puts it, "the result is a way of speaking that is mixed at every level but draws on Warlpiri structure more than on any of the other sources." Light Warlpiri can therefore be classified as a "mixed language" somehow different from the popular cases discussed in the literature, such as Michif or Media Lengua.

A fundamental aspect of Mufwene's ecological approach to the evolution of language is (individual) variation, and how it plays out in the competition-and-selection process that may ultimately lead to language change at the population level. Such a change can be observed, for instance, in intergenerational differences, with children using more systematically and frequently grammatical patterns than adults (see also DeGraff 2001a, 2001b, 2002, 2003, 2005).

Vivien Dunn, **Felicity Meakins**, and **Cassandra Algy** investigate such an ongoing change in small-scale spatial descriptions of Gurindji Kriol-speaking children. Like Light Warlpiri, Gurindji Kriol is a mixed language which combines the nominal syntax of Gurindji (a Pama-Nyungan language), with the verbal syntax of Kriol (an English-based creole). However, at the clausal level, both Gurindji and Kriol provide for the lexical elements that are computed in the nominal or verbal domains (see Meakins 2013). The two languages differ concerning spatial expressions: speakers of Gurindji generally prefer cardinal direction terms in both small-scale and large-scale space, as opposed to speakers of Gurindji Kriol who avoid this strategy in descriptions of small-scale space relations. Due to contact between these different languages, traditional Gurindji is only spoken by older generations, while younger adults and their children mainly speak Gurindji Kriol. The question that arises is whether this asymmetry may lead to a new system in subsequent generations' small-scale spatial descriptions in Gurindji. Based on the "Man and Tree" task given to children and adolescents, aged between nine and

seventeen, who have acquired the Gurindji cardinal system, the authors contend that this age-group uses a different strategy from their parents. Whereas the latter mainly rely on the cardinal system, the younger generation uses both cardinal- and landmark-based strategies to different degrees. As the authors conclude, however, "the landmark-based strategies are used in a quasi-absolute manner such that the spatial relations system remains conceptually geocentric." This instance of language change (or shift) is in line with Mufwene's ecological approach, in which the emerging system is never isomorphic with the source languages, as it presents new properties that embed aspects of the relevant donor languages.

Another relevant aspect of Mufwene's ecological approach is how the process of competition-and-selection unfolds and (partly) determines essential aspects of individual mental grammars. Their cumulative effect may lead to group linguistic behaviour which, in turn, fosters a change at the population level, i.e., language change. In the words of Mufwene (2001: 162):

> In the competition-and-selection approach […] the language that prevails actually wins a pyrrhic victory, as it adapts itself to its new speakers and contexts of communication, i.e., to part of its changing ecology. This validates again approaching languages as parasitic species and seeing their evolutions in terms of how they adapt to the responses of their new hosts while affecting, or eliminating, other linguistic species that they come in contact with […] The strong version of my approach to language evolution is that the competition-and-selection process has been typical of language change in any community and at any time.

When applied to the context of creole languages, with their alleged special structural type compared to non-creole languages, this approach makes it clear that classical Stammbaum trees used in genetic classifications are partial and imperfect. They are partial because they usually ignore the host, as well as the relevant contact settings concomitant with language change. They are also imperfect, because they treat change from an internal language perspective only. According to Mufwene, creole languages are no more illegitimate descendants of all their "donor" languages than Modern Romance languages (e.g., French, Portuguese, Spanish) would be of Latin. In French-based creoles and Romance families, the prevailing language wins a pyrrhic victory because it is a recombined variant of its donors (Aboh 2015; Mufwene 2002c). Because change is contingent upon recombination, there may be no structural distinction between so-called creoles and non-creole languages. Both come into being through the same process, and the prevailing language bears aspects of its source languages. Therefore, understanding language change requires investigating the genesis of the process in the source languages in contact.

Pieter Muysken†, like Mufwene, has always stressed that there are no structural traits that set creole languages apart as a type. Creoles, however, can inform us of

particular cognitive processes at play in contact situations. His primary interest in studying substrate influence is to unravel the principles underlying language contact, and show how linguistic phenomena ensuing from such contact can inform us about crucial grammatical aspects of the prevailing language. In his chapter on the formation of Northern Quechua languages, Muysken carefully examines the possibility of substrate influence by taking into account complex socioeconomic, political, and cultural factors that may have led to different situations of language contact or language shift. Because languages are dynamic systems in a state of constant flux, any endeavour to identify substrate influence proves to be very difficult. Muysken provides various guiding principles fully compatible with Mufwene's ecological approach:

1. Avoidance of the "Cafeteria Principle": The sociolinguistic history of the variety in question constrains the choices of source languages for substrate influence;
2. "Mutual Reinforcement": Patterns that exist in more than one substrate are more likely to be adopted by the emerging contact language (see Aboh & Ansaldo 2007);
3. "Conservative Substrate Influence": Properties in the emerging contact language become entrenched if they match properties in (a subset of) the substrate languages;
4. "Multiple Causation": Substrate influence can always converge with some other explanatory principle, with a mutually reinforcing effect between these strategies.

Based on these principles, and keeping in mind the role of acquisition (whether L1 or L2), Muysken surveys a rich array of facts in his comparison of Quechua languages, including fascinating cases of structural changes in Northern Quechua. Among such changes, he analyzes those affecting: case marking; person and number marking on pronouns and verbs; copula constructions; negation markers; markers for evidential, desiderative, intentional, hortative, purposive and potential; diminutive or pejorative suffixes; inalienable kinship; and phonological features, among others. Toward the end of his chapter, he provides a useful table summarizing all possible instances of substrate influence he has analyzed. Muysken's chapter clearly highlights that understanding how languages can influence each other, such as in the case of substrate influence, requires fine-grained analyses of the new varieties and how they compare to their source languages. Such a comparative approach calls for not only a well-informed understanding of the sociohistorical context in which the varieties emerge, but also a detailed knowledge of their grammars.

In creolistics, there have been many studies on various aspects of creole languages to determine which grammatical aspects of their source languages (the so-called substrate languages) contributed to their development (see Muysken and Smith 2015). The aspects of creole languages that figure prominently in such studies involve complementation (Aboh 2006; Winford 1985), serialization (Veenstra 1996), TMA-sequencing (Muysken 1981), noun phrases (Baptista & Guéron 2007, and predication (DeGraff 1992; Winford 1993).

Surprisingly, coordination/conjunction is one of the grammatical phenomena that hasn't received much attention in the field. Although there are some broad characterizations in APiCS (see Michaelis et al. 2013) and some descriptions of coordination/conjunction in individual creoles, not much is known about the syntactic and semantic properties of different coordination types within related creoles, and how these creoles compare to their source languages.

Bettina Migge's contribution aims to fill this gap. Her chapter adopts a three-way comparison between the Eastern Maroon Creoles or Nenge(e) and Western Maroon creoles (Matawai) of Suriname, and their main source languages, namely English and the Gbe languages. Regarding NP coordination, the Suriname Creoles display a relatively common pattern across creole languages. They use a unique form for expressing comitative, instrumental, and NP coordination. However, things are different with VP coordination. Although Haspelmath et al. (2013: 284–287) suggest that creoles do not generally distinguish between NP and VP coordination, the Suriname data show otherwise. Worth noting is how they also involve several VP conjunctions derived from various sources. Migge's chapter sheds light on the undocumented fact in creoles that the different VP coordinators occur in different temporal contexts. Accordingly, there is an interaction between tense/aspect specifications and VP coordination in these creoles. In addition, VP coordinators in these creole languages can be stacked to encode various meanings, including emphasis. Migge's descriptive analysis, based on a very rich data set, shows that the Suriname Creoles involve different coordinator-types, the usage of which suggests different developmental paths. Her chapter provides the first empirical ground for investigating how competition-and-selection operated in the emergence of various coordinate structures in the Suriname Creoles.

Marlyse Baptista's contribution on variation, competition, and change is a direct application of Mufwene's competition-and-selection framework. Based on the Swadesh list (Swadesh 1952), her study seeks to understand variation across five dialects of Cabo Verdean Creole, spoken on different islands in the archipelago, namely, Santiago, Fogo, Brava, Santo Antão, and São Vicente.

In addition to providing evidence in support of Mufwene's framework, Baptista sheds new light on lexical variation in Cabo Verdean varieties. She helps us conceptualize the nuts and bolts of Mufwene's framework, by comparing it

with Darwin's biological evolution theory. She focuses mainly on the impact of idiolect-level variations in Mufwene's competition-and-selection framework, on the one hand, and on the long-term effects of individual-level "infinitesimally small inherited modifications" on natural selection in Darwin's framework, on the other. Baptista's chapter raises two issues that require further investigation under the competition-and-selection model: (1) the granularity of the features subject to competition-and-selection; and (2) the role of semantic nuances in determining the "competing weight" of these features. These questions directly relate to the context of learning, which includes both the inputs the learner is exposed to and the learning biases that s/he is subject to. Baptista's contribution prompts us to address the role of L1 and L2 learners in generating the variation observed across the five Cabo Verdean varieties.

Daniel Véronique's chapter examines the role of naturalistic L2 acquisition by late learners in the development of French-Related Creoles (FRC). This approach may appear counter-intuitive, given the fact that creoles were not the creations of adults only, but emerged from interactions between L2 and L1 acquisition, that is, DeGraff's (2002) L2–L1 cascade (see also Aboh and DeGraff 2014). To understand this cascade, however, one needs to identify which L2 acquisition patterns could have populated the inputs that subsequent L1 acquirers of the creoles could be exposed to (see also Dunn, Meakins and Algy this volume; Muysken this volume). This is the focus of Véronique's chapter, in which he further calls for a more constructive dialogue between the fields of Second Language Acquisition (SLA) and creolistics. Véronique's methodology involves comparing linguistic patterns observed during the acquisition of French as a Second Language (FSL) to similar patterns in FRC. Unlike Plag's (2008a, b, 2009a, 2009b, 2011) interlanguage hypothesis, Véronique seeks to identify which most relevant linguistic features or patterns – arguably the results of acquisition processes – could have generated the inputs that subsequent generations of learners were exposed to. In terms of a uniformitarian approach to learners, Véronique argues that some processes governing the emergence of a mental grammar in the mind of the creole S-learner are the same as those relating to the L2 S-learner. Building on previous work on SLA varieties (e.g., Klein & Perdue 1997; Perdue 1996), Véronique compares aspects of FRC to FSL by examining, for instance, uninflected verb forms, the placement of negation vis-à-vis light verbs, presentationals, and lexical verbs. Based on the striking similarities between aspects of FRC and those of FSL, the author concludes that the restructuring of grammar in creole languages must have followed the same cognitive processes as in SLA. This chapter does not adhere to all aspects of Mufwene's ecological approach. Yet, its results are compatible with this approach in showing that (1) one need not evoke special cognitive processes other than common learning strategies adopted by S-learners to explain the structure of

creole languages; and (2) the speaking-learning ecology can constrain these strategies. These constraints result from language practices and community dynamics that typically inform us of the socioeconomic, cultural, and political forces at play within a particular speech community.

Lisa Lim and **Umberto Ansaldo** examine the relevant ecological factors to explain Peranakans' language practices and identity dynamics in local, transnational, and digital ecologies. They focus particularly on the role of these Malay-speaking descendants of South Chinese immigrants and Malay-speaking women in the development of Baba Malay, and, subsequently, in the spread and indigenization of English in the region. Thanks to their multilingual repertoire, which included English, the Peranakans played an important role as power brokers during the European colonization of the Straits of Malacca in the nineteenth and twentieth centuries. As was also the case in other trade and settlement colonies, these colonial intermediaries managed to convert their linguistic resources into economic capital. Further inquiry should tell us the extent to which their economic success shaped other communities' language ideologies regarding English in the region.

Peranakans' language and identity dynamics challenge some of the received ideas about the link between language and identity. Indeed, the Peranakans embrace their multilingualism (English, Malay, and Chinese) rather than their vernacular, Baba Malay, for defining their ethnic belonging. Accordingly, they don't seem to experience the loss of their vernacular, and subsequently, their shift to English, as a threat to their multifaceted cultural identity. We may wonder whether their privileged socioeconomic position during the colonial period plays any role in their strong sense of cultural identity, built independently of their ethnic vernacular. Is the fact that their shift to the British colonizers' language was not coerced through symbolic or physical violence, as was the case in other settlement colonies, part of the explanation?

What is striking about the Peranakans is less that they no longer speak their vernacular, but that they don't discursively construct the non-transmission of the language as an issue. However, Baba Malay is not completely absent from the public arena: used in cultural performances such as rap and hip hop, it is resemiotized as a language of modernity. We can see in this new usage of the language not just a way of keeping the cultural heritage alive, as Lim and Ansaldo argue, but also an act of creating new associations, a new cultural history of Baba Malay, for the younger generation. Also worth noting is how the presence of the Peranakans in modern Singapore's urban- and mediascape has become more conspicuous, with their cultural heritage being used as part of the branding of the city-state. The traditional image they help to construct offers an appealing contrast to the "global tech hub" aspects of the city.

The Peranakans' case corroborates at least two points made by Mufwene in several of his publications: (1) ethnic languages are not always a defining feature of cultural identity claims; (2) colonization as a factor in language shift and identity dynamics should be evoked in nuanced ways. Besides paying close attention to the type of colonization involved, as already mentioned, linguists should also refine the over-simplistic dichotomy between colonizers and colonized, by examining the population structure of any given territory. Lim and Ansaldo's chapter is in line with the World Englishes scholarship that advocates for the linguistic legitimacy of localized English varieties, in this case Peranakan English. However, we wonder if social stratification based on English variety also exists within the Peranakan community, and whether such stratification correlates with varieties internal to this community.

If ecology and the variation therein roll the dice, the next step for linguists would be to model these factors in order to determine their specific roles in the emergence of a new variety. One possible way to approach this question is to examine loan words as a window into contact dynamics, and investigate how S-learners integrate them into their repertoires.

Liqin Zhang, **Franz Manni**, **Ray Fabri**, and **John Nerbonne**'s chapter takes on this task by applying a computational analysis to loan words in two unrelated language groups: Turkic and Indo-Iranian. Their working hypothesis is that if two words from unrelated languages are similar in meaning and pronunciation, then one of the languages probably borrowed from the other, or even from a third one. Loan words can, therefore, inform us about aspects of the history of a community. Liqin et al.'s analysis rests on Mennecier et al.'s (2016) survey of Central Asian languages. Using the two hundred-word Swadesh list, they collected acoustic and lexical data of eighty-eight informants with a different L1 from the two language families: Kazakh, Kyrgyz, Karakalpak, Uzbek (Turkic), Tajik, and Yaghnobi (Indo-Iranian). They compared three different algorithms used to assess pronunciation similarity: PMI (Frequency)-Based Edit Distance, Spectrogram-Based Edit Distance, and Sound Class Algorithm (SCA). Although all these algorithms identify a large number of loan words, SCA appears to detect loan words most effectively with a superior recall, i.e. "the fraction of the humanly recognized loans that the process detects". Liqin et al.'s chapter offers promising avenues to contact linguists, by providing quantitative tools that will help direct their analytical gaze towards the relevant ecological factors that explain language contact in a given context.

Another aspect that still requires a principled account within the ecological approach is what makes a selected feature spread against others within a speech community: how does the competition-and-selection proceed? Various factors come into play here. As discussed in Aboh (2015), there are purely linguistic factors (like the features related to the interfaces) and also learning factors. Areas of

grammars that are hard to acquire may be more prone to allowing restructuring patterns which may spread across the community.

Nour Efrat-Kowalsky's chapter on grammatical gender in Dutch can be read as a proof-of-concept of this hypothesis. Gender assignment in Dutch has been known to be notoriously difficult for various learner profiles, including L1 learners, 2L1 learners (i.e., bilinguals), and early and late L2 learners. All these learner profiles exhibit overgeneralization of the common gender to some extent. Efrat-Kowalsky's starting point is to investigate how such a non-standard feature could spread within a community.

Through an analysis of tweets, the author shows how language users tend to overgeneralize the common definite determiner *de* with neuter nouns, a feature usually associated with immigrant Dutch varieties in the scholarly literature and in Dutch society. Her analysis concludes that even monolingual L1 speakers use *de* with neuter nouns, although to a lesser extent than bilinguals and L2 learners. The methodology she adopts enables linguists not only to track the life-cycle of a linguistic feature, but also to gather language-in-use data quickly. It also provides access to language users' (mediated) social networks, thanks to their self-declared identification and that of their interactants.

Social Network Analysis has long been a part of the toolkit of linguists studying language variation and change (see for instance Milroy 1987). Although analysing tweets makes language users' communicative behaviour easily measurable, we shouldn't forget, that Twitter is just one of the multiple social networks of an individual, as seemed to be the case of the tweeters examined by Efrat-Kowalsky. Indeed, S-learners belong to different social networks, each of which involves different linguistic practices and therefore competences. The ecologies of S-learners are therefore multiple. Accordingly, Granovetter's (1973) distinction between weak and strong ties is still relevant in the age of increasing online communication. Further analysis should help us to understand whether on- and off-line interactions exert similar sociolinguistic pressure on language users' performance, or complement each other.

The type of analysis offered by Efrat-Kowalsky enables us to formulate new hypotheses about the potential factors that contribute to language variation, and subsequent language change. More importantly, this study highlights the importance of the individual speaker in language variation, as opposed to the status-based social groups emphasized in earlier sociolinguistics work. One of the chapter's main contributions is to hypothesize that *learnability* (i.e., what can be learned or not) is an important ecological parameter that accounts for the spread of linguistic features among a diverse range of speakers. Corroborating Mufwene (1996), Efrat-Kowalsky argues that the less costly or complex it is to acquire, the more likely a feature is to be adopted by individual S-learners and therefore spread

within a community. This hypothesis is also reminiscent of Martinet's (1949, 1955) principle of economy in language, and Zipf's (1949) "principle of least effort". According to both authors, linguistic behaviour is shaped in part by the minimization of effort. Efrat-Kowalsky's chapter is also part of a growing scholarly literature that highlights how online communication provides invaluable linguistic data that can help us better understand how language patterns emerge.

Finally, the book closes with an updated version of a conversation between **Salikoko S. Mufwene** and **Michel DeGraff** (previously published in *Carrier Pidgin* 29, 2001), in which Sali reflects on the intertwinement of his personal and intellectual trajectories, and the genesis of some of his concepts and positions. Sali had no idea that the updated version would be published in this volume, which honours his work and his legacy in creole studies and theoretical linguistics.

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