New perspectives on the origins of language. Ed. by Claire Lefebvre, Bernard Comrie, and Henri Cohen. (Studies in language companion series 144.) Amsterdam: John Benjamins, 2013. Pp. xvi, 582. ISBN 9789027206114. $165 (Hb).

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Investigating the origins of language is undoubtedly one of the most fascinating quests of modern science. There are a number of reasons why this is so. First, language may not be THE ONLY THING that makes us humans, but it is surely one of a few salient traits of our humanity. Then, consider the mindboggling range of exciting questions that we ask when trying to deepen our understanding of what human language is: When did humans start speaking? Was it a gradual development? And if so, were there stages of protolanguage leading up to its modern form? Or did modern language emerge abruptly? What kind of cognitive and social dynamics would have been in place to facilitate its development? Is there only one origin or are we contemplating multiple origins in different locations? What does this tell us about the evolution of diversity and human dispersal? We could go on. What is obvious, as clearly shown in *New perspectives on the origins of language*, is that, in order to tackle these questions properly, linguistics cannot go at it alone, at least not in its traditional or 'core' sense. If linguistics wants to have a go at these highly significant questions for an understanding of humanity, it needs to evolve into a highly interdisciplinary science, intimately connected with the fields of anthropology, paleontology, primatology, zoology, neuroscience, and genetics (among others). The book under review makes a strong case for a new interdisciplinary field devoted to the study of language origins, and shows us that the field has already made some significant advances. We may never be able to positively answer all of the questions, but we are developing methodologies and refining tools that can shed a lot of clarity about our human origins, including language. Besides offering a brief insight into some of the developments reported in the book, this review also focuses in particular on the role that the discipline of linguistics specifically can play in this growing field of inquiry.

Lefebvre, Comrie, and Cohen present us with twenty-one chapters expanded from the invited lectures of the Summer Institute in Cognitive Sciences 2010. The chapters are organized into five parts. Part 1 gives an overview of the historical and philosophical perspectives on language origins from ancient times till the last century. Through addressing critical questions of language origins and adopting various methodologies from a number of nonlinguistic fields, the other parts reveal two distinct features of modern research on language origins: first, the scope and complexity of the topics concerning language origins vastly exceed what linguistic theories and methods typically cover; and second, the specificity and limitation of relevant disciplines make it difficult to obtain a comprehensive understanding of language origins based solely on a single discipline (cf. Gong, Shuai, & Wu 2013, Gong, Shuai, & Comrie 2014). Both features lead to the uniqueness of this line of research, compared with other traditional fields. In order to discuss the physiological, biological, and sociocultural prerequisites for language origins, fields such as anthropology and archaeology need to play a role in the discussion. As shown in Part 2 of the anthology, these disciplines examine the anatomy, products, and sociocultural relics of early humans. In this way we can gather evidence of the presence or absence of certain bony conformations in humans that are associated with speech and syntax, reconstruct the socioecological niches in which language originated and was used, and approximate the cognitive and social complexity of extinct language users. A systematic comparison between language and other forms of communication systems can further reflect the characteristics of language as a communication system, and studies in evolutionary biology and animal behaviors do fulfill this purpose. This is illustrated in Part 3 where, through a comparison of language with birdsongs, primate calls, and gestures, we learn about common and distinct features of animal communication systems. Some chapters also incorporate genetics and neuroscience research to further discuss the roles of particular genes (e.g. FOXP2) or brain organizations (e.g. lateralization in processing particular linguistic features) in acquiring and using language or other communicative means. Part 5 advocates computer simulation as an efficient tool to predict, recapitulate, and quantify the evolutionary processes of language origins within individuals and among group members. The

computational approach can illustrate how language emerged as a collective behavior via individual learning, biological evolution, and sociocultural transmissions (Brighton et al. 2005, Gong, Shuai, & Zhang 2014), which offer useful guidance for proposing and verifying particular scenarios of language origins.

Part 4 is concerned with contributions of a specifically linguistic nature. PETER F. MAC-NEILAGE offers a thesis to answer the following questions: What kinds of sound patterns were first linked to words? And how did the linkage occur? The clue to answering these questions lies in the babbling of infants, defined as 'one or more instances of a rhythmic alternation of a closed and open mouth, produced by a mandibular elevation/depression cycle, accompanied by vocal fold vibration, and linguistically meaningless, though giving the perceptual impression of a consonant-vowel (CV) sequence' (302). Babbling of the *bababa* type appears to be a good candidate for the precursor of speech for a number of reasons. First of all, babbling shows a serial order, that is, sequences of consonant-vowel alternation. The CV syllable type is allegedly the only type of universal syllable and predominates in most languages (Maddieson 1999). Note that the production of syllables shows high rhythmicity from early on, and rhythm has been recognized as an important organizational aspect of the serial order that underlies complex behavior (Lashley 1951). In addition, babbling results in a limited inventory of consonants and vowels (Locke 1983, Mac-Neilage & Davis 1990; see table 2, p. 307), all achieved by the rhythmic production of CV clusters via mandibular oscillation combined with vocal fold vibration. What is crucial here, MacNeilage maintains, is that the first meaningful words that the infant produces for the first months are derived almost entirely from the sound patterns of babbling. This also explains the most common early errors, such as consonant deletion and consonant harmony, which follow babbling features.

So if babbling is indeed the precursor of speech, how do we explain its emergence in evolutionary terms? In the study of naturally occurring behavior (ethology), a central concept is the 'fixed action pattern', or ritual behavior. Think of grooming or courtship as examples of stereotyped movement that can be seen as innate rituals in nonhumans. Similar to these, babbling displays the same characteristics of rhythmic and repeated movements observed in infants, which also include rocking, waving, bouncing, and so on (Thelen 1981). These rhythmical patterns are explained as programs designed to obtain motor control. Babbling is thus just one of the many rhythmic behaviors of infants. How it became available to them in the first place can be explained by those mandibular activities such as chewing, sucking, and licking that are typical of all mammals. These are body mechanics related to the need for continuous ingestion that allows mammals to maintain constant body temperature, and thus are directly related to our evolutionary past. There is independent neurobiological evidence for this, linking brainstems that control mastication to the control of speech (Lund & Kolta 2006). The third and final step of the thesis must concern the transition from babbling to words. This in MacNeilage's view can be found in baby-talk, the first words uttered by the infant, in particular the words for kin. This stage can really be seen as the 'invention' of language if you like, or what McShane (1979) called the 'nominal insight', the realization that things can have names. Baby-talk may be seen to follow from babbling in that it displays a preference for the same CV structure, and for CVCV repetition (MacNeilage 2008). The words for 'mother' and 'father', in particular, show a remarkable tendency across languages: the word for female parent tends to include a nasal consonant, one of the few preferred consonants in babbling; and the form for male parent tends to have a nonnasal consonant that is often coronal or labial.

The significance of *mama* and *papa* sequences in the evolution of human language is the focus of the study presented by PIERRE J. BANCEL and ALAIN MATTHEY DE L'ETANG. There are three strands to their argument: (i) babble-like sequences such as *mama* and *papa* are some of the obligatory steps toward full articulation; (ii) child-parent cooperation during the babbling stage ensures that these sequences are transmitted the way children produce them, rather than undergoing accommodation to a language-specific lexicon; and (iii) words such as *mama*/*papa* belong to the earliest stage of human language, that of Proto-Sapiens, estimated at around 200,000 years ago. According to this scenario, the evidence in favor of *mama*/*papa* sequences as some of the earliest

words of human language rests on overwhelming historical comparative data. Based on Starostin and Nikolayev's etymological database (2007), the authors locate *ma* and *pa* roots for 'mother' and 'father' terms respectively in Proto-Indo-European (**ma-*, **pa-*/**tat-* or **tet*), Proto-Dravidian (**appa*), Proto-Turkic (**ana*, **ata*/**apa*), and even Chinese. According to these authors the overwhelming amount of data rules out chance resemblance, and the historical comparative evidence goes against the idea that these forms are simply recreated independently with every generation of speakers, as suggested by Trask (2003). Based on this reasoning, Bancel and de l'Etang sketch a possible scenario for the emergence of language in which, in the beginning, sequences of the *mama*/*papa* type were produced as some of the earliest sounds because of simple biological and neurochemical constraints. It is no accident that this canonical babbling would be associated to the immediate kin, since complex socialization counts as one of the earliest and most fundamental features that distinguish humans from other primates. Parents would have recognized these sequences and adopted them as actual words, that is, fixed a meaning to them. This explains why such forms have remained so remarkably consistent in the evolution of language. From here, assuming the ability of linguistic transmission in early humans, the rest can be accounted for by increased sound-to-word correspondences in kin as well as other areas of the lexicon (next step possibly pronouns; see pp. 362–63 and 375–77). This is a fascinating account of language origins that suggests articulate speech could have been discovered by accident and emerged as part of the unique social environment of early humans.

From early sounds and words we turn to the origins of grammar itself. In their chapter 'On the origin of grammar', BERND HEINE, GUNTHER KALTENBÖCK, and TANIA KUTEVA tackle the difficult question of how grammatical structure might have evolved. In an earlier work (Heine & Kuteva 2007), the framework known as GRAMMATICALIZATION—the study of how lexical items evolve into function words and then grammatical structures—was proposed as a possible account for the evolution of grammar in the history of human language. In that work Heine and Kuteva suggested that in the earliest phase of language only nouns would have existed. In a second phase verbs would have developed, followed by adjectives and adverbs, and then later other grammatical markers (for a summary see figure 1, p. 381). That scenario assumes that human cognition would have been the same 100,000 years ago as it is today, and that language evolution can be treated as a case of language change driven by creative recombination. In this chapter the authors turn to another question, that of linguistic fossils. According to some (see e.g. Jackendoff 2002), some elements of modern language might be leftovers from a previous stage. These are typically elements with phonology and semantics but no syntax, including vocative expressions ('ladies and gentlemen'), imperative phrases ('hold on'), and formulaic expression such as greetings and interjections ('damn'). Heine and colleagues call this set 'theticals' and argue for the necessity of a new area of study, that of THETICAL GRAMMAR (TG). According to their thesis, TG relates to social interaction and the expression of emotions, that is, elementary functions of human communication, and could be a candidate for an early form of grammar. The authors suggest that evidence may be found in neurological correlates. As it turns out, this is not so easy to establish. In a recent study on the processing of small clauses, another candidate for linguistic fossils, Ansaldo and colleagues (2015) found that small clauses activate both the left and the right hemispheres (LH/RH), and even if the RH shows more activation than in the processing of syntactically developed structures, the LH is still heavily involved.

DENIS BOUCHARD focuses on the neuronal system that underlies language. The key idea here centers on what Bouchard calls the 'offline brain systems' (OBS). In his view, a unique aspect of the human cognitive system is the capacity of mental constructs without sensory input. This can be seen, for example, in our ability to create visual imagery from memory. OBS did not emerge specifically for language, but were essential in allowing humans to form the link between things or concepts and signs in our minds. The first step in the evolution of language was, according to Bouchard, the evolution of this representational capacity. Once signs were born, the second step was the development of a self-organizing system based on recursivity, which allows for the emergence of grammar. What is important in this proposal is the refutation of universal grammar, in the sense that the human brain does not possess language, which can be seen as a neurological

side effect. Instead, humans can be said to have 'a language-ready brain with neuronal systems unique to our species (OBSs) that provide us with a qualitatively different memory' (435).

CLAIRE LEFEBVRE tackles the role of pidgin and creole languages in the field of evolution. Since Bickerton 1990, 2009, there have been two related assumptions: that pidgins, as restricted systems, might offer us clues to the nature of protolanguage; and that the development of some pidgins into creole languages might reveal how modern language evolved from a proto stage. The question Lefebvre asks is: Are pidgin and creole languages relevant in understanding language origins? The answer is an emphatic and resounding 'no'. Despite much evidence in support of this, it is an answer the field and its related disciplines need to hear over and over again. There are two parallel lines of argumentation on which Lefebvre's refutation builds: (i) the hypothetical properties of protolanguage do not correspond to the typical properties of restricted pidgins; and (ii) while protolanguage and modern language differ in a number of substantial aspects, pidgin and creole language are largely similar. After a review of the data, Lefebvre synthesizes the picture in a number of tables (473–75). The salient differences between protolanguage and restricted pidgins can be seen in the fact that pidgins, unlike protolanguage, display functional and grammatical categories, fixed word order, recursion, and verb-argument linking. In addition, restricted pidgins are independent of context, which protolanguage allegedly was not. Crucially, all of the properties that appear in restricted pidgins and differentiate them from protolanguage are also found in creole languages. This goes to show that pidgins and creoles are far closer as language types than the pidgin-to-creole scenario maintained, and as a consequence the idea that creole genesis might reveal aspects of language evolution is untenable. Due to the deep and intrinsic structural differences of protolanguage and pidgin and creole languages, the nature of the changes that characterize the process of creolization, whether viewed in terms of grammaticalization or contact-induced changes, cannot be reasonably likened to the developments that took protolanguage to its current modern form.

The focus of this review has been on the contributions of a specifically linguistic nature to the study of origins. This is important because, of all of the disciplines that participate in this important interdisciplinary quest, linguistics has appeared to be somewhat late, and shy, to the party. Linguistics has obviously severe limitations since it can stretch its reach at best up to a period of time roughly 10,000 years ago (Trask 1996), a time when languages would have been fully modern and developed. This is of course an important stage, as shown by Bancel and de l'Etang, who in their contribution make a strong claim for the importance of the comparative method and long-distance comparison. The synergy between this approach and the one by MacNeilage also shows the potential of cross-fertilization between historical and developmental perspectives. When we turn to the more theoretical approaches we see an added challenge, that of lack of concrete evidence to support the hypotheses being offered. What all of these approaches do share in common out of necessity is an evolutionary developmental biology (evo-devo) approach to the study of language origins. While this is indeed the necessary stance for linguistics to take at this point in time, it must be taken with care; as shown in Lefebvre's contribution, there are cases, such as creole genesis, in which evo-devo simply does not work.

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Strengthening the PRO hypothesis. By LISA A. REED. Berlin: De Gruyter Mouton, 2013. Pp. x, 385. ISBN 9781614510413. $150 (Hb).

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This book deals with the phenomenon of control, which represents a core topic of investigation both in the early generative theories and in modern minimalist approaches. The major interest in this topic is related to the syntactic status of the unpronounced subject of control infinitives, inflected infinitives, subjunctives, and indicatives.

Chronologically speaking, in the framework of GOVERNMENT AND BINDING, PRO and its distribution are analyzed on the basis of the binding theory. Accordingly, since PRO is simultaneously an anaphor and a pronoun, further stipulations are needed in order to avoid violations of the binding conditions. One necessary requirement for PRO is that it does not have binding domains and, hence, it should not be governed and Case-marked. This is known in the literature as the PRO theorem, introduced by Chomsky (1981).

A second stage in the investigation of control constructions began with the rise of the MINIMALIST PROGRAM (see Chomsky 1995 and subsequent work). Chomsky and Lasnik (1993) propose that PRO is the only NP that can bear null Case due to its covert nature. Chomsky and Lasnik (1993) and Chomsky (2001) also argue that null Case is only assigned by a nonfinite T. Landau (2003 and subsequent work) proposes an Agree-based approach to PRO and rejects a null Case approach. The advantage of his approach is that he can account for the crucial contrast between raising and control constructions. This difference is observable in languages with case concord, like Icelandic. When the embedded predicate assigns quirky case to its subject in Icelandic, this case shows up on the matrix subject in raising but not in control constructions. The