

The Language Origin Paradigms: Conceptual Typologies, Results Accumulation, and Theoretical Perspectives

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Abstract

Studies of the origin and early evolution of language are undergoing rapid development. New directions, topics and methods of research are appearing. It becomes necessary to structure the research field, as the formation of a single space of intellectual attention contributes to a more productive communication between different groups of scientists, better mutual understanding, and strengthened arguments. The article proposes the grounds for typologizing the concepts of the origin of language and identifies three main paradigms on the basis of these typologies. The sharpest disputes are between Continualism (“human language is only quantitatively different from animal language”) and Saltationism (“human language is so fundamentally different from the communicative systems of animals, that it could only appear as a result of some amazing leap or unique mutation”). Continualists usually focus on the communicative and cognitive abilities of different species (with a clear preference for apes). Saltationists focus on the linguistic, mental and cognitive structures of humans. Both of these polar approaches are opposed by the Multistage ecosocial paradigm, which emphasizes a long, multistep process of glottogenesis with behavioral adaptations of hominid groups to the changing natural and social conditions of their existence. A list of the most plausible, theoretically substantiated propositions is given, as well as research results supported by a variety of circumstantial data. The theoretical and methodological perspectives of the multistage ecosocial paradigm related to overcoming from its drawbacks are presented. A generalizing conceptual framework corresponding to the basic principles of evolution, the laws of social interaction should be constructed. The extremely heterogeneous arsenal of methods should also be structured in a single scientific logic.

Keywords: language origin, glottogenesis, stages of language evolution, cognitive evolution, typologies of conceptions, research programs, nomological approach, cultural drive, gene-cultural coevolution.

1. Introduction

The explosive growth of scientific interest in language origins during the last three-four decades has led to an abundance of conceptions (ideas, versions, hypotheses, approaches) of varying degrees of plausibility and validity. If we apply Herbert Spencer’s well-known principle to the evolution of glottogenesis research itself, then differentiation must necessarily lead to integration, designed to reconnect a multitude of separated elements. In this regard, along with the emergence of new synthesis reviews,¹ the formation and development of the project Causal

¹ Many works give informative reviews, particularly (Bickerton 2009; Fitch 2010; 2017; Bernabeu & Vogt 2015).

Hypotheses in Evolutionary Linguistics Database (CHIELD, <https://chield.excd.org/>) seems natural, claimed, and promising. The project

“...allows users to apply computational search and visualization methods, in order to express, explore, and evaluate hypotheses” (Roberts et al., 2020: 3).

CHIELD aims to collect and process information about thousands of variables, many thousands of relationships between them,² to test many hundreds (thousands in perspective?) of hypotheses and theories. Such a bold project deserves all the support it can get. However, does its current version integrate the efforts of very heterogeneous research groups and centers?

In his *Sociology of Philosophies*, Randall Collins convincingly demonstrated the need for a focused field of intellectual attention and competition of opposing positions to scientific and philosophical creativity (Collins, 1998). According to the “law of small numbers,” there should not be many such positions (no more than 5-6), only then the attention of many researchers remains focused, and the probability of successful advances in epochal thought turns and discoveries increases.

It is convenient to represent “scientific research programs” (Lakatos, 1978) as “conceptual paradigm + methodological approach” pairs as such positions. The first component includes basic ontological notions expressed in initial principles, concepts, categories, schemes. The second component includes ways of judgments justification, rules of correct, reliable research methods, truth criteria.

It is hardly possible by the early 2020s to speak of holistic, structured research programs in the field of language origins, which different scholars and groups perceive as distinct positions opposing each other. For such a structure of the intellectual attention field to emerge, it is necessary to identify the main aspects and lines of separation. Let us first consider the fundamental ontological aspects. If it is possible to compile aspects and typologies covering the most significant glottogenesis conceptions, then definite combinations of types from different typologies form the initial versions of alternative paradigms.

The reasoning becomes too abstract, so let us give the main typologies of evolutionary concepts of glottogenesis (may I hope the reader will forgive the complete neglect of non-evolutionary, i.e., creationist ideas). The names of well-known authors and their publications indicate the conceptions corresponding to the individual types of conceptions.³

2. Typologies of conceptions

Structure of evolution and the problem of language Rubicon:

- *Continualist conceptions* – multiple features of sound communication, already present in animals, naturally developed, combined in human ancestors, and as a result turned into articulate speech⁴ (Darwin, 1871/1981; Christiansen & Kirby, 2003; Turner

² “Version 1.1 of CHIELD includes 400 documents and 3,406 causal links between 1,700 variables” (Roberts et al., 2020: 9).

³ Almost all conceptions are multi-component and do not have to fit seamlessly into one type, so the same authors appear in different typologies and types. Consequently, there is no claim to an exhaustive listing of the literature: authors’ names and references only play the role of illustrative examples.

⁴ “It is not the mere power of articulation that distinguishes man from other animals, for as everyone knows, parrots can talk; but it is his large power of connecting definite sounds with definite ideas; and this depends on the development of the mental faculties” (Darwin 1871/1981: 54).

& Maryanski, 2008; Fitch, 2010; Turner & Machalek, 2018). Adherents of these concepts either do not mention the *language Rubicon*⁵ or explicitly reject its existence.

- *Saltationist conceptions* — a single mutation or a crucial cognitive invention led to the emergence of language with syntax, recursion (Bickerton, 1981; Chomsky, 1986; 2016). In one term or another, the authors insist on the cardinal importance of the language Rubicon, on its insurmountability through evolutionary development as a gradual adaptive change.⁶

- *Variant*: the faculty of language in the broad sense (FLB) developed gradually from animal communicative abilities, and the faculty of language in the narrow sense (FLN) with recursion emerged through rapid mutation processes and computations outside of the domain of communication (Hauser et al., 2002). In other words, FLB developed without any essential barriers (continualism), but FLN appeared just in a disposable and dramatic crossing the language Rubicon (saltationism).

- *Multistage conceptions*: there are some steps⁷ of preparation for the speech, breakthrough to speech, and increasing complexity of language (Donald, 1998; 2001; 2017; Jackendoff, 2002; Bickerton, 2009; Wildgen, 2012; Dediu et al., 2013; Sterelny, 2016; Fitch, 2017; Gabora & Smith, 2018). The language Rubicon is real and substantial, but our ancestors overcame it evolutionarily through multiple stages and over an exceedingly long time.

Direction of causality:

- *The causality “bottom-up” and “inside-out”*: from parts, elements to a whole system, from quantity to quality, from a mechanism to a process. *Change of a structure → selection*. This type includes explanations based on ideas of Neo-Darwinism (random mutations + natural selection), “natural” anatomical and physiological changes. The continualist and saltationist conceptions are usually inclined to such internalism.

- *The causality “top-down” and “outside-in” means* from a whole — to a part, from a system — to an element, from a process — to a mechanism, from a function — to a structure. Such schemes as *function → adaptation (a providing structure in a wide sense)* and *challenge → response* also belong to this type. A tension (a need, disturbance of homeostasis) leads to mass behavior activity, subsequent changes in abilities, and organic prerequisites. Such external explanations usually presuppose climatic and/or geographical determinism.

- *The cyclical causality and spiral development* emphasize feedback loops, interactions between environment and populations, functions, activity, and structures, between “outside-in” and “inside-out” impacts. Multistage concepts focusing on the interconnection of environmental, technological, social, and communicative drivers tend to elaborate ideas of coevolution and spiraling development (Donald, 1998; 2001; 2017; Bickerton, 2009; Dor, 2015; Sterelny, 2016; Laland 2017).

Ontological levels of “springboards to speech” and main drivers:

- *Biology: anatomy, physiology, neurosciences, genetics*:

⁵ The “language Rubicon” means the qualitative boundary between the communicative systems of animals and human language.

⁶ See the recent criticism in (de Boer et al., 2020).

⁷ Punctuated equilibria which hold that evolutionary transformations took place in sudden, radical steps (Gould & Eldredge, 1977).

- Brain growth, enlarged Broca’s area, the action of “mirror neurons,” overlapping neurons (Deacon, 1997; Kay et al., 1998; Dunbar, 2003; Givón, 2009; Arbib, 2005, 2017; Gabora & Smith, 2018);
- A consequence of laryngeal transformation, increase in thoracic vertebrae size that enhanced breathing control (Maclarnon & Hewitt, 2004; Fitch, 2010);
- The emergence of *FOXP2* (Enard et al., 2002).
- *Ecology, environment, climate, demography* (Alexander, 1990; Lovejoy, 2009; Bingham, 2010; Bickerton, 2009; Powell et al., 2009; Richerson et al., 2009; Laland, 2017; Page & French, 2020).
- *Material technology, cultural innovations, symbolism:*
 - “Labor theory” going back to the ideas of L. Geiger and L. Noiret; action planning and imagining the future product (Engels, 1884/2010; Iriki, 2005; Stout, 2002; 2005);
 - Need to teach mastery (Morgan et al., 2015; Laland, 2017);
 - Cultural innovations (Richerson et al., 2009);
 - Symbolical activity (Donald, 1998; Henshilwood & Dubreuil, 2011).
- *Linguistics:* the genesis of syllable and sound distinctions, protosyllables, their chains, the identification of relics in modern languages, analogs in pidgins⁸ and creole languages, in deaf languages, in various speech disorders in patients, in babbling, the first speech of children mastering a language (Jackendoff, 2002; Dessalles, 2007).
- *Psychology: cognition, memory, attention, emotions* (Luria, 1981; Byrne, 1996; Breyll, 2021).
- *Social relations and processes, interactions within and between groups:*
 - Gesturing, facial lip movements (Arbib, 2005; Corballis, 2010; Heyes, 2012);
 - Grooming (Dunbar, 1996; 2003; Wildgen, 2012);
 - Singing, recitatives, rituals, games, and other “useless” practices (Darwin, 1871/1981; Burling, 2005; Power, 2014);
 - Parenthood, learning (Hrды, 1999; Lovejoy, 2009; Power, 2014; Morgan et al., 2015; Laland, 2017);
 - Changes in gender relations have led to the need for flirting, seduction (Lovejoy, 2009; Deacon, 1997; Miller, 2000; Burling, 2005; Power, 2014);
 - Collaborative activities include mobilization in the struggle for prey, recruiting, group hunting, keeping the fire going, and cooking (Bickerton, 2009; Wrangham, 2010);
 - Violence, dominance, leadership, “Machiavellian reason,” conspiracy (Byrne, 1996; Wrangham, 2019);
 - The result of coalition dominance over singles, self-domestication [Belyaev, 1979; Bingham, 2010; Hare et al., 2012; Dor, Jablonka, 2014; Wrangham, 2019].

⁸ Pidgins are languages formed between representatives of foreign language groups, for example, in cross-border trade). Pidgins lack syntax and grammar but use simple word order schemes (e.g., “subject-action-object,” “subject-predicate”) that allow communicating effectively simple meanings when the context is known to interlocutors.

- Joint intentionality, normativity, interactive rituals, rephrasing and guessing (Christiansen & Kirby, 2003; Knight, 2006; Tomasello, 2008; Zlatev, 2014; Rozov, 2022);
- New economy with deferred liabilities, exchange, gossips (Sterelni, 2016).

For obvious reasons, specialists in their fields focus on analyzing, describing, and searching for the drivers of glottogenesis in their respective types of processes. However, there is no doubt that processes in all ontological levels took part in the origin and evolution of speech and language. Let us now consider the main methodological approaches.

Empirical, inductive, and idiographical approaches

- *Reconstructions and path tracking* of the emergence of speech and language development without any attempt at explanation, but with only a description of successive phenomena: “how it probably happened.” The majority of springboard conceptions use this type of narrative
- *Particularist ad hoc explanations* pretend to justify judgments about consequences by judgments about concrete local causes; there are no general hypotheses or laws on which these conclusions are at least implicitly based; the approximate formula of such explanations is: “certain conditions arose at that time and place, and so the old structure developed (transformed) into a new one.”
- *The use of analogies* includes observations of the development of the speech abilities of young children, studies of patients with aphasia, languages of the deaf, the development of pidgins and Creole languages, and animal communication.

Modeling, experimental, and deductive approaches⁹

- *Experiments with analog models*; the reasoning includes phenomena similar in some features to language emergence and evolution: mastering speech by children, adult subjects’ mastery of making tools, using abstract symbols, teaching, f. e., chimpanzees or bonobos using sign-labels (Morgan et al., 2015; Tamariz & Kirby, 2016; Kirby, 2017; Lloyd, 2004; Rumbaugh, 2013; 2015; Fitch, 2017).
- *Experiments with robots* that can interact and communicate (Nolfi & Mirolli, 2010).
- *Abstract computer simulations* (Markov & Markov, 2020).

The synthesis of inductive and deductive approaches:

- *Systematic comparisons using general principles* (Turner & Maryanski, 2008; Cavalli-Sforza, 1997; Richerson & Boyd, 2005; Irvine et al., 2013; Dediu et al., 2013; Dor & Jablonka, 2014; Donald, 2001, 2016, 2017; Roberts et al., 2020).

3. Three approximate paradigms of glottogenesis

As discussed above, no self-conscious and opposing research programs have emerged. A massive portion of the concepts form the following potential paradigms:

- The Continualist-Biological paradigm:
 - neglecting or rejecting the language Rubicon;

⁹ Most conceptions combine two or more approaches, principles of explanation; therefore, the given examples of publications play only a tentative illustrative role.

- focusing on anatomy, physiology, brain, tools;
- causality is mainly “*bottom-up*,” “*inside – out*” (genetics), and “*outside-in*” (selection);
- reconstructions, path tracking, and particularist explanations.
- The Saltationist-Cognitivist paradigm:
 - the emphasis on the language Rubicon as a barrier that could not be overcome evolutionarily;
 - focusing on language and cognitive structures;
 - causality is mainly “*top-down*” (from a mind to a brain, speech behavior) and “*outside-in*” (from functions in the environment to a mind);
 - modeling, experimental, and deductive approaches.
- The Multistage-Ecosocial paradigm:
 - the language Rubicon is real, but it was overcome through several evolutionary stages;
 - focusing on interaction and coevolution of all ontological levels and structures (niches, social orders, behavior, mentality, language, brain, neuron ensembles, anatomy, physiology, genetics);
 - causality is multilevel, based on feedback loops, coevolution, and spiral dynamics;
 - the synthesis of inductive and deductive approaches, systematic comparisons, testing hypotheses.

The third paradigm seems to be the most reasonable and promising, and I will further present it in more detail. If the provisions of the first two paradigms will ever be systematized, their adherents will best do it. Let me cite a critique of my conception (Rozov, 2022) from both sides to argue for their existence. The anonymous American reviewer writes explicitly from the position of biologically oriented continualism:

“All Great Apes – Chimps, Gorillas, and Orangutans – have the neurological capacity for language. They can understand English or any language if raised in an English-speaking environment from infancy. Moreover, they can “speak” through sign language of the deaf or type their speech on a computer with dedicated icons denoting meanings [...] So, I suspect that this is an author who has read a lot, but who also does not know a key part of the literature on the origins of speech and cognitions. He apparently does not understand that speech evolved out of a pre-adaptation among great apes (with whom humans share a common ancestor), and so language was not the problem, but rather articulated speech because great apes do not have the capacity [...] And even in the proposal there is some obvious ignorance. For example, whether Neanderthals had speech is ridiculous; they had a 1600 cm³ brain, much larger than humans, and you bet that they could talk.”

Well known in Russia biologist Evgeny Panov who authored many books about anthropology and cognitive evolution, criticizes my conception from the opposite position:

“Is it possible to believe that the transition period from the early precursor to the late precursor took about a million years? In my opinion, it is admissible to suppose that the jump-like emergence of linguistic abilities occurred for the first time as a result of an epiphany of some prehuman Einstein, who realized that a sound signal is a sign-symbol of something existing in its environment (for example, a rock or a tree),

something that we call a signal referent. If such a step was taken in understanding the underlying meaning of a single protophrase, the transition to the formulation of protophrases must hardly have stretched over a million years.”

Here I am not going to argue with my critics. The quotations are just illustrations of the actual existence of the first two paradigms. The third one is in the crossfire of both.

It is a particular topic how the paradigms connect with different research activities and how is it possible to relate each paradigm to some extensive, long-run scientific research program in terms of Imre Lakatos (Lakatos, 1978). Research possibilities of the first two paradigms seem somewhat limited. The continualists usually focus on various species’ communicative and cognitive abilities (with evident preference to apes). The saltationists concentrate on human language and mental and cognitive structures, emphasizing their absolute specifics.

Only the Multistage-Ecosocial paradigm is sufficiently wide to embrace many research tasks and approaches. Now there is no definite self-conscious scientific research program for this paradigm. Nevertheless, most accumulated ideas and results are mutually compatible. Structuring them opens the vast space of prospective research directions. Arguments are in the cited works.

4. The Multistage-Ecosocial paradigm: main ideas and results

1. Speech and language¹⁰ appeared as an *adaptation (a providing structure)* during biological, social, and cultural evolution. The studies and results (Alexander, 1990; Pinker, 1994; 2010; Jackendoff, 2002; Bickerton, 2009; Bouchard, 2013; Dediu et al., 2013; Dor et al., 2014; Henrich, 2015; Sterelny, 2016; Laland, 2017) include the following interrelated trends and principles:

- an increase in the number of putative stages (phases, steps) of language evolution; addition of initial stages up to the epochs of Heidelbergians, Habilises, or even Australopithecus (0.5, 1.6, or 4-6 mya¹¹);
- attention to *constructing new techno-natural and social niches*;
- *significance of social relations and orders*, greater attention to intragroup and intergroup interaction and communication under the *multilevel selection mechanisms*;
- the close connection of language with other cognitive abilities and spheres (consciousness, memory, culture, thinking, searching, and constructive activity).¹²

¹⁰ Here and below, speech and language are distinguished quite traditionally according to F. de Saussure (Saussure, 1986). Before the appearance of writing, speech as a behavioral process of speaking/recognition and language as a coherent set of sign and semantic constructions were just two aspects of a holistic phenomenon. Speech always used language components at any stage of its development, including the most ancient ones. Language manifested outwardly only in speech and was transmitted across generations exclusively through speech. The same attitude took place at all stages of glottogenesis. All new language structures were born in speech, reproduced in it, and served as “springboards” (ingredients) for forming linguistic innovations again in the speech processes.

¹¹ From now on, “mya” means million years ago, and “kya” indicates thousand years ago.

¹² “The problem with many efforts to understand the evolution of language is that the lenses used are often focused too narrowly. By placing language within the context of our species’ overall repertoire of communicative abilities and then seating this within culture-gene coevolution, we can begin to see the synergistic relationships between tools, practices, norms, communication, and language. Languages are a subset of culture that are composed of communicative tools (words) with rules (grammar) for using those tools” (Henrich, 2015: 232).

2. Speech and language at each stage of evolution belong not to an individual, brain, or organism but to community (group, union, population, society)¹³ members who use the sign and semantic system for communication, remembering, the transmission of experience. Language is in some sense a “social technology,”¹⁴ but it does not mean that hominids and Sapiens (before the invention of writing) ever focused attention on it as something separate from their interaction.

3. As in other aspects of sapientation, *functional changes preceded structural changes, and behavioral innovations preceded genetic shifts*. The *function→adaptation* scheme usually accompanies the “*top-down*” and “*outside-in*” causality principle. Challenges to the living system come from outside, or from needs of “higher” processes to “lower” mechanisms, from needs, concerns, stresses related to survival in a given niche to providing structures: behavioral, mental, physiological, anatomical, genetical (Givón, 2009; Bickerton, 2009; Dor, 2015; Laland, 2017).

4. “*Bottom-up*” and “*inside-out*” causality is also significant since the supporting elements, connections, structures are not entirely plastic. All of them have some degree of rigidity, limits of variability. They are more able to change in some directions and less able to change in others. Therefore, the “underlying” mechanisms set the framework of variability (a “channel,” a “track”) for the “overlying” processes but can also provide the latter with new “beneficial” opportunities (in terms of delivering functions, needs). Providing structures of different nature (from genetic to anatomical and psychophysiological) appeared through mechanisms of *gene-cultural coevolution* and *cultural drive* due to attempts, i.e., definite mass behavior of multiple generations to respond to various challenges and difficulties (Wilson, Lumsden, 1983; Dediu et al., 2013; Laland, 2017).

5. At the initial stages, speech abilities already developed through *positive feedbacks* with morphological changes of the larynx, brain enlargement, especially frontal (volitional) and temporal (speech) areas, neural and muscular mechanisms of breathing control. Modern dating of hominid anatomical changes related to speech ability is based on archaeological data (Deacon, 1997; Martínez et al., 2004; Wood & Bauernfeind, 2012; Boer, 2011; 2017). Consider the following summary with all concessions concerning approximation and differences in the dating:

- from 1.6 mya to 100 kya, the vertebral column (the thoracic vertebrae) developed steadily, allowing *control over breathing*;
- between 400 and 300 kya, the skull changed, indicating the *lowering of the larynx*, this shift is considered a prerequisite for the ability to articulate speech;
- ca. 300 kya, *the sublingual nerve canal increased* and approached the size characteristic of modern humans, indicating the possibility of controlling fine motor skills (Donald, 2011; 2017);
- specific sapient changes in the “speech gene” *FOXP2* appeared ca. 300-200 kya (Enard et al., 2002);

¹³ “Not all human minds have language, but all societies do [...] All human societies use different variations of the same technology, locally designed by cultural evolution for the universal function of the instruction of imagination. This is an *absolute universal*” (Dor, 2015: 150).

¹⁴ “The question of the evolution of language is no longer a cognitive question: it has to do with the evolutionary history of the technology – its invention, development, propagation, and diversification, the social contexts within which it emerged in ancient human communities, the ways it changed society once it was established, and so on. It is a question about the *social-technological* development of humanity. The question of the evolution of human minds (in the plural) and their relations with the emergent technology is thus secondary: it has to do with the involvement of individual human minds in a technologically-driven process” (Dor, 2015: 190).

- the structure of *the hyoid bones* (nerve channels) in the remains of Protosapiens or Early Sapiens, dating from ca. 100 kya became identical to humans.

6. *The formation of joint intentionality* and basic *moral rules, norms*, especially those related to solidarity, communication of meaningful information, kinship relations, regular collective actions. This mutual assistance became a necessary condition for speech development (Tomasello, 2008; 2019; Stringer, 2012; Zlatev, 2014; Dor, 2015).

7. Regular suppression, prevention of in-group aggression and violence evolutionarily led hominids to self-domestication (Belyaev, 1979; Hrdy, 1999; Lovejoy, 2009; Bingham, 2010; Hare et al., 2012; Power, 2014; White et al., 2015; Wrangham, 2019). These structures included:

- the practice of cooperative threats and collective violence against abusers;
- egalitarian (including female) coalitions;
- ostracism of rapists and brawlers;
- norms of sharing the spoils.

8. Speech abilities, and hence the linguistic structures (distinctions, units, constructions) appeared separately over an exceedingly long time (hundreds of thousands of years); alternation of breakthrough and long cumulative periods in language development is supposed by analogy with the development of stone technologies (Bybee, 2002; Burling, 2005; Bickerton, 2009; Bouchard, 2013: 211-215; Donald 1998; 2001; 2016; 2017; Dessalles, 2007; Hurford, 2012; Fitch, 2017; Gabora & Smith, 2018):

- hominids consistently and concomitantly reached certain stages in the development of language and consciousness;
- there was coevolution in aspects of articulation, meaning understanding, verbal memory, the ability to describe distant events, to identify relationships, and to switch contexts;
- the likely stages of increasing linguistic complexity were protowords, pidgin-sentences (without word order), sentences with syntax and grammar, logical models including recursion, rhetorical constructions, adornments of speech, professional terminology;
- along with the multiplication of elements came various convolutions, which enabled complex content to be conveyed and understood by simple means, using subconscious structures and skills.

9. The step-by-step development of speech abilities (and relevant language structures) retook place *through positive feedback* to several fundamental processes of *social and mental sapientation*:

- in the establishment and expansion of *social norms* in sexual and parental relationships (Hrdy, 1999; Lovejoy, 2009; Heyes, 2012; Power, 2014; White et al. 2015);
- *in planning, coordinating group actions*, including protection from predators, finding, and cutting up carrion of animals, hunting, finding new types and sources of food, gathering, *maintaining fire and cooking*, organizing stays, dwellings (Gärdenfors & Osvath 2010: 104-114; Bickerton, 2009; Wrangham, 2010);
- in the exact copying of complex actions, including tools making (Morgan et al., 2015; Laland, 2017: 188-207);
- in establishing *relations of prestige and leadership* in the group (Zlatev, 2014; Laland, 2017: 267; Tomasello, 2019);

- in providing relations of *exchange, kinship* within and between groups, in discussing and resolving conflict situations (Stringer, 2012; Sterelny, 2016);
- in *gossip, wit, and courtship* (Miller, 2000; Dunbar, 2004; Power, 2014);
- in a variety of types of *symbolic behavior*, including early art forms, burials with inventory, magical and religious rituals (Dor et al., 2014: 208-248);
- in the accumulation of a wide variety of cultural patterns or memes, in the learning, socialization, and enculturation of younger generations, respectively, in the *generational reproduction of culture* and social experience, with *language development reducing the costs of growing memory and the difficulty of transmitting experience* (Falk, 2004; 2016; Morgan et al., 2015; Laland, 2017: 184, 266; Markov & Markov, 2020).

10. In “here and now” micro-situations, processes of emotionally intense interaction *like rituals* usually accompanied the use of speech (Deacon, 1997; Collins, 2004; Laland, 2017; Tomasello, 2019); probably, the development of speech and language was profoundly connected:

- with the *emotional intensity* of initial speech communication, with difficulties of understanding, *with repetition*, with the use of facial expressions and gestures;
- with *systematic correction of each other's mistakes*, the joint concentration of attention, synchronization of rhythms, emotions, and simultaneous actions.

Appearance and evolution of language as a “technologically-driven process” (Dor, 2015: 190) had primary causes and drivers in changing ecological (techno-natural) niches and changing social orders. Figure 1 presents a model of interaction between phenomena of distinct ontological levels.

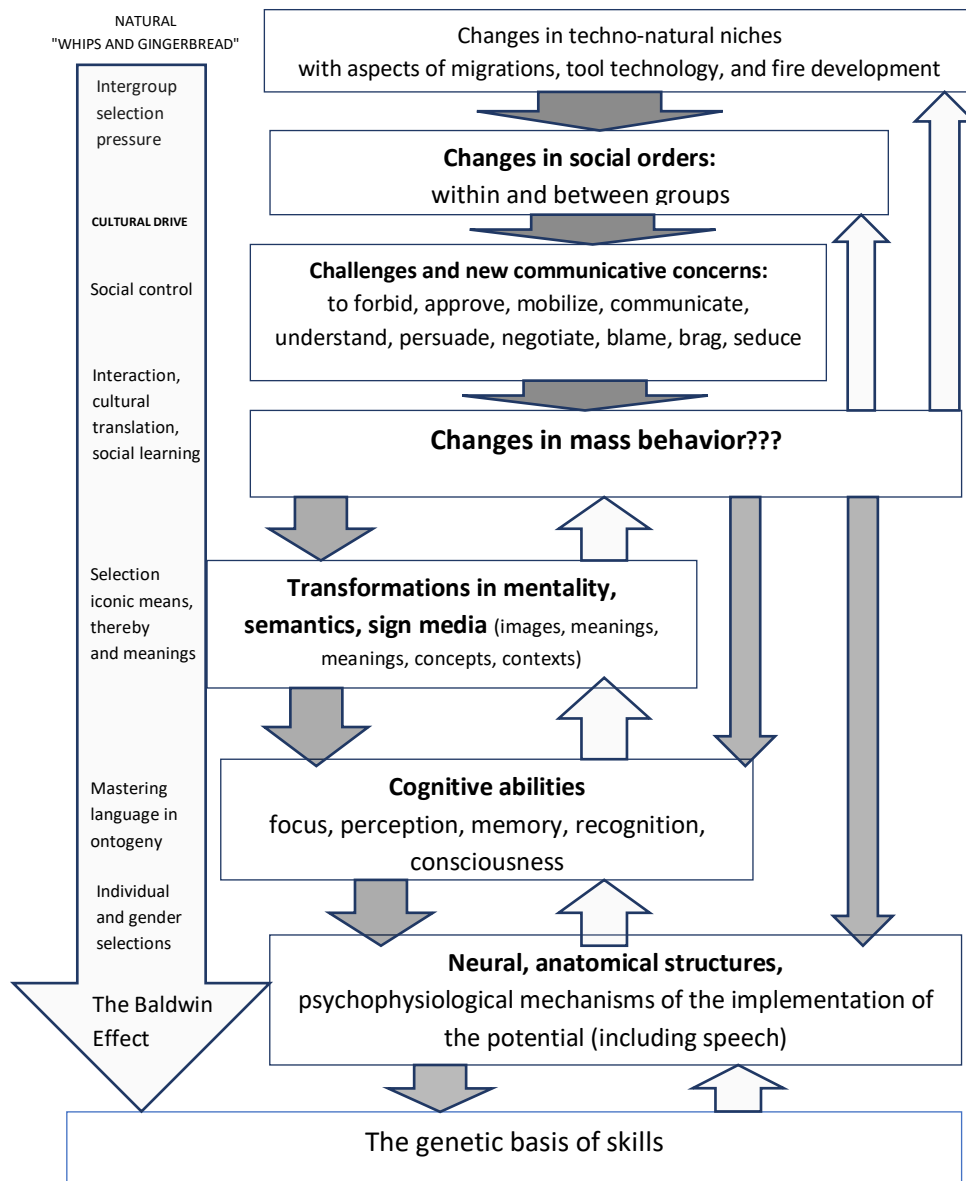


Figure 1. Levels of changes in glottogenesis and causal links between them

In the Figure 1, the shaded arrows mean causal influences “from the top-down” and “from the outside in”: from processes to mechanisms, from functions, needs, concerns – to providing structures. White arrows mean the reverse causality vector – costs, constraints, and opportunities “supplied” by structures. The levels in bold are the focus of this study. This model serves as a starting point for the multistage conception unfolded in (Rozov, 2022).

Attention should be paid to the block “Changes in mass behavior” (with question marks). It is central to the diagram since it is the source of causal connections to the rest of the blocks. According to the Multistage Paradigm, the central problem of glottogenesis is as follows: *what shifts in hominid mass behavior led to the progressive development of language and consciousness (see points 1-10 above), and what were the driving forces behind these changes at each evolutionary stage?*

5. Theoretical and methodological perspectives

Despite solid research findings and the level of agreement on principle points reached, the emerging paradigm is far from complete. Instead, it represents a kind of springboard for another advance in knowledge. New research goals are related to the main difficulties and shortcomings of the paradigm: the absence of a generalizable conceptual framework,¹⁵ the extreme heterogeneity of methods and research directions, no correlation or weak connection between interpretative aspects.

These difficulties and the conducted typology of concepts allow us to formulate the following requirements for the further development of the Multistage Ecosocial paradigm:

- articulated principles of evolution;
- a basic conceptual construct (scheme, set of models) capable of encompassing all stages of glottogenesis;
- the sequential transition from stage to stage according to general hypotheses or laws correlating with evolutionary principles;
- inclusion of processes of all levels of movement (from genes to intergroup interaction) into conceptual “cells” with causal, functional, structural, or other links;
- the possibility of including versions of “springboard” concepts from various spheres of our ancestors' life during the anthropogenesis epoch (interaction with the natural environment, instrumental activity, relations in groups and between groups, spheres of subsistence, security, sexuality, parenthood);
- a methodological approach encompassing multiple methods of obtaining, interpreting indirect data on glottogenesis, turning them into a kind of megamachine for hypothesis making and testing, is needed. It is necessary to present the regular connections between the phenomena in a pair of theoretical and empirical hypotheses for each stage.

Let us return to the broad questions raised at the beginning of this article. Structuring studies of the origin of language as a single field with focused intellectual attention seems necessary and promising. It is not necessarily that the three paradigms presented above, with such names, will be the prominent opposing positions in this field. Let them be other paradigms, but there should not be more than five, preferably less.

As an adherent of the Multistage Ecosocial paradigm, I hope for its victory and domination. In this case, according to the laws of intellectual dynamics (Collins 1998), it will split into several positions. For example, one can expect that there will be an opposition of advocates of the long evolution of language (starting from *Australopithecus* or even earlier), the medium duration (from *Homo habilis*, *Homo heidelbergensis*), or the short duration (the Early Sapienses or even *Cro-Magnons*). Other lines of division are also possible.

What positive changes might occur if this or that version of structuration became widely known and the currently unfocused intellectual attention became focused?

At the level of language origin theorizing, we should expect a new explosion of creativity, a vigorous competition between explanatory concepts. Theorists will try to get into the center of intellectual attention, and to do this, they will express their ideas using concepts familiar

¹⁵ “...There is a period of roughly 2 million years during which most of the action must have occurred, with only a few anatomically distinct stages between *Homo habilis* and *Homo sapiens*. A complete model needs to explain how all of the empirically deduced derived components of language evolved during this period. Most existing models attempt only to explain some of the DCLs (= derived components of language) (e.g., speech or syntax, but not both), and few grapple with the entire package” (Fitch, 2017: 11).

to the representatives of competing concepts. The ideas and models contributing to the “Great Game” of colliding paradigms will naturally enjoy the most significant interest.

At the level of specific empirical research and development of new methods, processes similar to the orientation of chaotic particles of iron powder when approaching a magnet will occur. The scholars and grantors will direct their interest to such research programs and results, which will shift the scales in favor of one paradigm or another. Therefore, we should expect a flourishing of empirical research in the logic of critical experimentation. Interpretations and reinterpretations of their results will become the focus of attention in the same “Big Game.”

Significant and promising transformations may occur in the design and strategies of such field-spanning systems as CHIELD. Already the micro-scale of accounting for connections between single variables gets sense and becomes intriguing in the meso-scale of competition between competing conceptions, say, between “gossip” by Dunbar and “ritual” by Knight, Power, and Watts (Roberts et al., 2020: 10-11). A continuation of the same logic in projects of this kind would be a macro-scale focusing on the competition between a few major paradigms and related research programs.

The consolidation of the intellectual field and the growth of focus will be long-lasting and productive through the active involvement of at least 10-15 leading journals that systematically publish articles on the origins of language. Convictions of an editorial board, traditions, and specialization of each journal often lead to the dominance of a particular group of concepts or paradigms. Here, as elsewhere, isolation leads to stagnation. Therefore, the openness of each journal to different concepts, stimulating discussions, and responding to intellectual clashes in other journals will contribute to an optimal atmosphere for productive creativity.

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