THE 'MUSICAL' ORIGIN OF LANGUAGE GRAMMAR AS A MILESTONE FOR THE DEVELOPMENT OF A COMPLEX CONCEPTUAL MIND

PIOTR PODLIPNIAK[1]

[*]Corresponding Author: podlip@amu.edu.pl
[1]Department of Musicology, Adam Mickiewicz University in Poznań, Poland

1. Abstract

Speech is composed of two elements: 1) affective prosody (Brown, 2017) and 2) articulate vocalizations which are claimed to be processed by two different neurological pathways (Ackermann et al., 2014). At the psychological level, affective prosody is based on continuous changes of parameters such as pitch and loudness, whereas articulate vocalizations consist of perceptually discrete entities such as phonemes and words that enable combinatoriality (Hilliard & White, 2009). While articulate vocalizations transmit meaning by means of the exchange of mental concepts, affective prosody acts as a source of emotional induction. Moreover, compared to articulate vocalizations, affective prosody is less susceptible to volitional control (Ackermann et al., 2014). As language grammar seems to be a framework for the exchange of complex conceptual meanings, its origin is usually claimed to be related to articulate vocalizations and the conceptual mind (Ginsburg & Jablonka, 2019). However, the crucial features of language grammar – hierarchy and recursion – are also present in music (Pinker & Jackendoff, 2005; Rohrmeier et al., 2015) which is devoid of propositional semantics (Lerdahl, 2013), and which shares many traits with affective prosody. The main aim of this theory-based proposal is to present a scenario in which language grammar might have originated from primary 'felt' sound relations used to induce emotions, rather than from articulate symbols. From this perspective, the mechanisms that enabled proto-musical forms of rhythm and pitch hierarchies could have been exapted to serve a hierarchical framework for sound (and gestural) symbols in order to enable the exchange of

information about increasing social complexity. This exaptation could have led to the emergence of language grammar and a complex conceptual mind.

In order to trace the sequence of events that led to the evolution of language grammar, a comparison between speech and music is proposed. For instance, the presence of the elements of affective prosody in many mammalian vocalizations, as well as in all forms of human vocal expressions (Ross et al., 2009), can lead us to assume that speech prosody consists of features that evolved long before the emergence of language. In addition, propositional meaning in the form of referential concepts seems to be much older than *Homo sapiens*. These concepts could have probably been externalized by means of both sounds and gestures long before the appearance of hominins. After all, the simple forms of such externalizations are still observed in apes (Kalan et al., 2015).

It has been proposed that language could have evolved as a result of a merger between two functionally different communicative protolanguages: one designed to express external meaning and another designed to express internal meaning (Podlipniak, 2022). If this scenario is true, the human conceptual mind owes its complexity to the evolution of both of these communicative systems. Although prosody is usually perceived in a continuous way it can also be experienced, under some conditions, as being composed of hierarchically organized discrete pitch and rhythm units (Deutsch et al., 2008), which suggests that hierarchization is achievable without semantics. Moreover, as simple temporal hierarchies have been observed in infant-directed speech and song (Falk & Kello, 2017), as well as in non-human vocalizations (Ravignani et al., 2019) which are devoid of propositional meaning, it is reasonable to assume that hierarchical communication has its roots in the affective prosody. This view is supported by the fact that in the least grammatically complex natural languages the grammatical relations depend mainly on prosody (Gil, 2005; Jackendoff & Wittenberg, 2014; Sandler, 2017). From this perspective, the appearance of a complex semantic compositionality was possible thanks to the exploitation of the previously existing mechanisms that enabled hierarchical ordering of affective sounds in the domain of symbolic articulate vocalizations. In other words, the emergence of language grammar could have been the result of the exaptation of cognitive mechanisms used in preconceptual proto-musical expressions into the creation and externalization of hierarchical relations between concepts and words.

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