Towards an action-based approach to the evolution of language and music

Language and music considered as cognitive systems form a mosaic, consisting of multiple components with different evolutionary origins (Boeckx, 2013; Fitch, 2006). From a comparative language-music perspective, some of these components might be shared and based on the same evolutionary genesis, while others might be different and emerged independently in the course of evolution. Moreover, from a comparative between-species perspective, some might be shared with other animals, while others might be unique to humans. This shared-distinct dichotomy dominating the recent comparative approach usually depends on tailor-made categories fitting to just one domain or species and thus limits the range of investigation by its all-or-nothing contrastive view (De Waal & Ferrari, 2010; Theofanopoulou & Boeckx, 2015). Alternatively, the current paper suggests an action-based approach as a promising comparative approach to investigate language and music. In particular, based on the findings from cognitive and evolutionary neuroscience (Lieberman, 2002, 2016; Merchant et al., 2015; Merchant & Honing, 2014; Patel & Iversen, 2014; Rauschecker & Scott, 2009), I discuss how the cognitive systems language and music might be implemented in the brain in form of *distributed networks* on the basis of domain-general, action-based neural structures, particularly the basal ganglia, the cortico-basal ganglia-thalamo-cortical circuits, and the dorsal stream including Broca's area. This approach, on one hand, avoids the problematic shared-distinct dichotomy by examining cognitive systems in terms of *distributed networks* realized by means of the basic domain-general neural structures which also underlie action cognition such as representing goals, action planning and control as well as sensory-motor integration. On the other hand, it does not reduce distinct cognitive domains to a single all-purpose system because it explains the way how those neural structures implement each cognitive system differently. Moreover, such an action-based network approach to cognitive systems provides rich between-species comparative strategies because the above mentioned neural structures and networks are largely (but not completely) shared with non-human primates' action cognition (Mendoza & Merchant, 2014). Thus, the result of the current paper provides a strong support for hypotheses suggesting to regard current neurocognitive systems such as language and music as products of evolutionary changes from ancestral systems such as action cognition (Boeckx & Fujita, 2014; Fujita, 2016; Marcus et al., 2006).