Why don't cockatoos have war songs?

BBS Commentary on Mehr et al. "Origins of music in credible signaling" & Savage et al. "Music as a coevolved system for social bonding"

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Abstract:

We suggest the accounts offered by the target articles could be strengthened by acknowledging the role of group selection and cultural niche construction in shaping the evolutionary trajectory of human music. We argue that group level traits and highly variable cultural niches can explain the diversity of human song, but the target articles' accounts are insufficient to explain such diversity.

Text:

It is rare (but not uncommon) that music is performed alone or specifically for oneself. Most functional accounts of music evolution therefore rightfully place group functions such as bonding and coordination at the forefront of their hypotheses. The target articles by Savage et al. and Mehr et al. excel at providing functional group accounts for their hypotheses using phylogenetic and comparative accounts of animal vocal behavior. But a question remains regarding the differentiation of human musicality from the music-like behaviors of animals. We want to ask not what features human music has *in common* with animal vocalizations, but ask instead, "why is human music *unique*?" That is, why do we see an increase in the diversity and flexibility of form-function links in human song compared to birds and non-human primates? We propose a simple answer to the dilemma by noting that it is not just human music which is unique, but human sociality, which may have had a fundamental role in the evolution of music. In short, the uniqueness and diversity of human music could be the result of the manner in which human songs are nested within complex and highly variable social and cultural environments.

Both articles compellingly point to comparative examples of music-like behaviors in other species in order to show continuity between non-human and human musicality. In the case of Mehr et al, phylogenetic examples from the primate kingdom are highlighted to emphasize the role that territorial calls may have had in shaping group songs. In Savage et al., examples from primates, whales, and birds are used to show that coordination of melodic, harmonic, and complex rhythmic patterns is less developed in these social species. Meanwhile, these coordinated actions serve as a sort of glue for the role of *communitas* in human sociality. Despite this difference, they also note that some birds demonstrate human-like beat perception and rhythmic abilities. One notable example of such a bird is Snowball, a sulphur-crested cockatoo who can famously entrain to a musical beat (Patel, et al., 2009) and has recently showcased a diversity of spontaneous dance movements in response to music (Keehn et al., 2019). Additionally, thrush nightingales, like humans, demonstrate cultural evolution of categorical rhythms (Roeske et al., 2020). These nightingales also produce isochronous rhythms, a pattern important for synchronous coordination in human music and dance (however, nightingale rhythmic coordination is notably different from that of human music-making, Roeske et al., 2020). There is now some evidence of similar coordinated rhythmic abilities in primates (Gamba et al., 2016). In sum, both humans and non-human animals share similar, yet not identical, capacities for rhythm and synchrony, both fundamental features of human musicality.

If we share so many important music-like features with primates and birds, as in the case of Snowball, why is it that our *repertoire* is so much more diverse? A general musical toolbox as proposed in Savage et al.'s hypothesis is insufficient for explaining musical diversity, as the authors note themselves, stating, "Each feature may have been initially based on behavioral innovations... each innovation opened a new cognitive/musical niche selecting for independent specialization of relevant neural circuitry." Likewise the more *specific* territorial defense feature of our primate ancestors as proposed by Mehr et al. is insufficient to explain the plethora of form-function links that are the hallmark of their theoretical approach. In both articles, the role that group selection plays in shaping form-functionality is largely downplayed. This approach is limiting, as group selection is essential when we begin to ask questions such as, "why don't cockatoos have war songs?"

This is where integrating an understanding of selection for group-level traits is critical (Smaldino 2014; Zefferman & Mathew 2015; Richerson et al., 2016). Cockatoos lack war songs

because cockatoos lack *war* (see Hobson 2020 on the individualistic nature of bird fights). Unlike the examples from both birds and primates, humans occupy a unique social niche characterized by both its productivity and recombination (cultural evolution) and its ability to create new problems and avenues for these processes (cultural niche construction). While many birds indeed exhibit cultural evolution of their songs and material culture, as in the case of bowerbirds, and possess the same hallmarks as human song's "unique" features such as its incremental change, learned elements, and social preferences, the application of these features is largely tied to singular and highly specific functions such as mate choice or predator evasion. In the case of humans, form-function links in song are highly varied precisely because our 'functions' vary along an extremely diverse social dimension.

Smaldino (2014) refers to many of these unique traits as emergent 'group-level traits,' which are those traits which "are properly defined only at the level of group organization." A timeline of the evolution of human music should certainly take into account the evolution of group-level traits, all the way from our basal primate origins to what Peter Turchin (2016) has coined our "ultrasociety". Unlike primate and avian societies, human societies exhibit group structures that are both hierarchical and multidimensional, with differentiation within and between levels, and traits distinguishing these structures and levels (Moffett, 2019; Smaldino, 2019). The adaptive significance of these traits almost certainly had an effect on the evolution of human music diversity (related proposals have been suggested for the evolution of language—see Thompson et al., 2016). It is not unlikely that as human social life expanded the importance of culture in shaping human behavior did as well, with vocal plasticity both in the forms of speech and music finding its way into our social niches.

We believe that the accounts by both articles greatly expand our understanding of human music evolution and are a long awaited start to a serious conversation on the origins of music. However, both approaches would be enriched by granular attention to the unique social evolution of our species, particularly the way our complex social structure has shaped the cultural evolution of behavior—from kinship, to occupations, to social differentiation. The complex and highly variable social and cultural environments associated with human ultrasociality almost certainly had a functional effect on music evolution.

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