FROM GRASPING TO GROOMING TO GOSSIP

DAVID A. LEAVENS
School of Psychology, University of Sussex, Falmer, East Sussex, BN1 9QH, United Kingdom

JARED P. TAGLIALATELA
Department of Biology and Physics, Kennesaw State University, Kennesaw, GA, 30144, U.S.A.

WILLIAM D. HOPKINS
Neuroscience Institute, Georgia State University, Atlanta, GA, 30303, U.S.A., and Division of Psychobiology, Yerkes National Primate Research Center, Atlanta, GA, 30322, U.S.A.

Abstract

The unique challenges posed by evolutionarily novel situations can illuminate the limits of flexibility in animal signalling systems. Here we describe the innovative application of species-typical calls by chimpanzees exposed to the novel circumstances in which the animals are dependent upon others to act on the world for them, what we have previously termed The Referential Problem Space (Leavens, Hopkins, & Bard, 2005). When chimpanzees are put into the Referential Problem Space, they frequently display attention-getting calls and other auditory signals (Hopkins, Taglialatela, & Leavens, 2007; Leavens, Russell, & Hopkins, 2010; Taglialatela, Reamer, Schapiro, & Hopkins, 2012). Interestingly, the kinds of calls that chimpanzees use in these evolutionarily novel circumstances are, for the most part, amplified versions of the same calls that they display in grooming contexts both in the wild and in captivity (Leavens, Taglialatela, & Hopkins, in press; Taglialatela et al., 2012). Thus, this class of auditory signals, used in affiliative, grooming contexts, is chosen overwhelmingly by chimpanzees for application towards novel ends.

This is consistent with Dunbar's (1996) hypothesis that early humans substituted auditory contact for manual grooming as group sizes exceeded ca. 150 people. We will review the biomechanics of call production in primates, describe the
most typical kinds of calls that chimpanzees use to capture the attention of human interlocutors in captive environments designed to elicit referential communication, describe their uses by wild or free-ranging great apes, describe some of the unique call signatures of enculturated great apes, and then summarise the relevant evidence from oro-facial and neurophysiological asymmetries, which show that these attention-calls display an opposite pattern of cerebral functional organisation from that displayed by more “emotive” calls.

Taken together, these findings highlight a theoretically significant intersection between Dunbar’s (1996) Gossip-as-Grooming hypothesis and Corballis’s (2002) Hand-to-Mouth hypothesis. The former implies that grooming calls are those most readily adapted to new ecological circumstances, while the latter implies that the mouth is the next-most-flexible site for intentionally communicative signaling, after the hands. The empirical findings we describe support both of these implications, derived from two disparate theoretical strands. Moreover, this body of evidence suggests that the evolutionary pathway to spoken language can be extended to far earlier than the hominin split from the rest of the great apes: humans were pre-adapted for speech. (This analysis will appear in Leavens et al., in press.)

References