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The Role of Modes of Communication

Members of higher-FF groups, such as some galagos, may be able to coordinate their movements by leaving scent marks and calling to each other from a distance (Bearder 1999). The ability to monitor social partners and rivals at a distance (via vocalizations and scent) and especially over time (via scent) could release them from the need to maintain proximity without reducing the quality or complexity of their social relationships. Fissioning in taxa employing scent marking and long-distance calling may not produce as much uncertainty about social relationships as it does in taxa that are more dependent on visual and tactile signals. Modes of communication that transmit over long distances and persist over time may therefore permit a higher level of coordination among dispersed conspecifics than is usually inferred from their low rates of close-range social interactions. Conversely, even in species that usually travel in cohesive groups, occasional separations may select for complex signals that can be used during reunions to communicate essential information for facilitating social interaction. An example is the "wheeze dance," which is sometimes observed during reunions of white-faced capuchin monkeys (Manson and Perry 2004) and which is comparable to the embraces of members of higher-FF groups that reduce tension at times of fusion (Schaffner and Aureli 2005; Aureli and Schaffner 2007) despite these monkeys living in lower-FF groups. Thus, variation in signaling between lower-FF and higher-FF groups may be a matter of a quantitative rather than a qualitative distinction.

We do not mean to imply that the quantitative measures used in our framework can adequately capture all of the nuances of social relationships upon which variation in communication styles is based. Instead, we suggest that even simple measures, such as those that quantify display durations and their interactive components, can provide a preliminary basis for comparisons among species and for testing hypotheses about the multidimensional fission-fusion space.

Obviously, more comparative data on social communication from a wide diversity of species are needed to evaluate predictions derived from our framework. For example, different signals at reunions are also expected in carnivores that differ in their degree of fission-fusion dynamics, such as spotted hyenas, wolves, and dwarf mongooses (fig. 4; cf. Holekamp, Boydston, and Smale 2000). In addition, regardless of their placement on the social landscape (fig. 4), gathering systematic data on the behaviors in which individuals engage preceding separation or immediately following reunions could be compared with similar behaviors that occur in other contexts. This would elucidate not only whether certain behaviors are unique to higher-FF groups but also whether behaviors within a given species are unique in the context of fission and fusion events. Intraspecific variation in the frequency, duration, and use of signals could occur as a function of the degree of cohesiveness across different age-sex classes (e.g., African elephants; Poole, Lee, and Moss n.d.; fig. 4).