Abstract

The selective pressures and type of selection from which the human brain arose have been a source of curiosity and controversy since the dawn of Darwin’s Evolution Theory. Since 1953 Chance and Mead suggested that the need to ensure a sexual partner was the selective pressure favoring neocortex size increase in primates. Later, Jolly in 1966 and Humphrey in 1976 acknowledged the complex social life of primates as the source of neocortex increase and improvement of higher cognitive processes. Yet, it is until 1988, with Whiten and Byrne’s Machiavellian Intelligence hypothesis when the idea that social living is the main force behind the evolution of the primates’ brain is established. The Machiavellian Intelligence hypothesis presumes that throughout evolution, primates have developed a set of social strategies by which individuals search to increase direct or indirect reproductive benefits, resorting to the profitable use of agonistic or cooperative behavior, according to the situation. Various complex social behaviors, such as reconciliation, alliances, and sabotage, are actually known in primates. Among these, the first two are well characterized, their distribution and variability being known among primate species, as well as the consequences of resorting or not to them. On the other hand, the vocalization studies have shown that, besides having a vast diversity of calls, primates are able to distinguish kinship and dominance relationships, relying solely on vocalizations. The aforesaid implies a positive correlation between neocortex size and complex social behavior variety. Although this particular correlation has proven difficult to test, comparative analyses have shown that neocortical size varies as a function of certain socioecological variables. In one of the first works controlling phylogenetic inertia, Dunbar showed that neocortex size changes in relation to average group size of free-ranging primates: the larger the group, the larger neocortical size is. Moreover, it has been found that neocortex size increases along with the mean number of females within the species typical group size. Yet, there is no covariation between neocortical size and mean number of males. More detailed analyses have shown that along with neocortex size, other brain areas, such as the striatum or the amygdala, respectively, increase along with the number of females per group or group size. Another finding has shown that the number of neurons in the parvocellular lamina increases along with mean group size, and only marginally in relation to the proportion of fruit ingested. As such, it stands that social living exerted a major effect in the increase of the parvocellular lamina, than ecological pressures such as food quality...
Keywords
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