BRAIN GROWTH IN CHIMPANZEES: WILD VS. CAPTIVE, MASS VS. VOLUME

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Introduction. This study compares postnatal brain size change in two important samples of chimpanzees (Pan *troglodytes):* brain masses of captive apes from the Yerkes National Primate Research Center, and endocranial volumes (ECVs) of wild-collected individuals from the Ta'i Forest, Cote d'Ivoire. Unlike for other skeletal collections, age at death is known for every individual in these samples. These cross-sectional datasets therefore allow inferences of patterns and rates of brain growth in these populations. Previous studies have revealed differences in growth, development and health between wild and captive animals, but such habitat effects have yet to be investigated for brain growth. It has also been hypothesized that brain mass and endocranial volume follow different growth curves.

Materials and methods. To address these issues, I compare the Yerkes brain mass data (n=70) with the Ta'i ECVs (n=30), modeling both size and velocity change over time with polynomial regression.

Results and discussion. Yerkes masses overlap with Tai volumes at all ages, though values for the former tend to be slightly elevated over the latter. Velocity curves indicate that growth decelerates more rapidly for mass than ECV. Both velocity curves come to encompass zero between three and four years of age, with Yerkes mass slightly preceding Ta'i ECV. Thus, Yerkes brain masses and Ta'i ECVs show a very similar pattern of size change, but there are minor differences indicating at least a small effect of differences in habitat, unit of measurement, or a combination of both.

Conclusions. The overall similarity between datasets points to the canalization of brain growth in chimpanzees: there is little to no deviation from a genetically defined pattern of brain development despite environmental differences.