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AGE, REPRODUCTIVE STATUS, AND COGNITION IN FEMALE CHIMPANZEES

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Hormonal status and age are potential modifiers of cognitive function in women. Their influence on cognition has also been studied in monkeys, but not in chimpanzees. We monitored ovarian status of female chimpanzees by examining patterns of genital swelling and by measuring urinary ovarian steroids. Our oldest female chimpanzee, age 53, still had ovulatory cycles, as confirmed by hormonal measures. Although no female was menopausal (defined as 12 months or more in good health without menstruating), some were acyclic because of an underlying physical condition, such as an enlarged uterus. We tested these same chimpanzees on a variety of tasks measuring spatial and social aspects of cognition. Tasks were based upon those administered to young chimpanzees and children by Hermann et al, (Science, 2007, 317, 1360-1366.) and included measures of Spatial Memory, Object Permanence, Transposition, Rotation, Relative Numbers, Causality, Tool Properties, Communication Comprehension, Communication Production, Sensitivity to Attentional States, and Gaze Following. By comparing non-cycling and cycling females, we were able to simultaneously examine the influence of reproductive status and age on these tasks. There were no differences in performance between cycling and non-cycling female chimpanzees and no influence of age on these measures. These are among the very first observations of cognitive function in aging chimpanzees; they have particular relevance for the influence of age and menopause on cognition in women.

Keywords: chimpanzee, cognition, ovulation, menopause