

**SENESCENCE AND TERMINAL INVESTMENT IN FREE-RANGING FEMALE RHESUS MACAQUES
(*MACACA MULATTA*)**

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Long-lived species may show age-related changes in reproduction that may be explained by two non-mutually exclusive processes. The process of senescence predicts decreased female reproductive output with increasing age due to age-related declines in body condition. The terminal investment hypothesis predicts increased female reproductive effort with increasing age, as there is a reduced likelihood of aged individuals successfully reproducing in the future. Non-human primates are ideal organisms for testing the relative effects of these processes, as they are long-lived and produce offspring heavily dependent on maternal investment. In this study, we integrated data collected over 50 years from 637 adult female rhesus macaques (*Macaca mulatta*) and their offspring residing on Cayo Santiago, with new morphometric and behavioral data collected from 26 adult females and their infants, to test for effects of senescence and terminal investment. We examined relationships between maternal age and the body condition of both mothers and infants, mother's interbirth intervals, measures of mother's behavioral investment in offspring, and offspring survival and fitness. Older mothers had lower body mass indices and were less active, had longer interbirth intervals, invested more behaviorally in infants, but nonetheless had infants of lower masses and survival rates. Our results provide strong evidence for reproductive senescence in free-ranging female rhesus macaques, but are also consistent with some of the predictions of the terminal investment hypothesis. This research was supported by the National Institutes of Health (grant number R21-AG029862 to D.M., and grant number CM-5-P40RR003640 to the CPRC).

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