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Toward a broader spectrum Primatology: Integrating epidemiological and experimental approaches

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Primatology is the scientific study of primates, but research takes many forms--ranging from highly controlled experimental studies involving major interventions and manipulations to naturalistic observations and surveys. Some primate research involves cross-sectional comparisons, while other projects follow individuals longitudinally. Some work seeks to characterize populations, while other studies emphasize individual differences. Goals vary from seeking understanding of human evolution or human health to conservation of nonhuman primate populations. Some investigators whose work involves nonhuman primates is aimed entirely at improving human health. Others consider nonhuman primates worthy of study in their own right to understand them as themselves. Four projects will be described that included various methods and, at times, integrated epidemiological and experimental methods. The "Prematurity in Primates" project in which the Principal Investigator, Gene P. Sackett, at University of Washington used records from a primate breeding colony to identify the most and least successful breeders and included them in a series of detailed follow-up studies. The second was "The Sulawesi Primate Project," an international collaborative multidisciplinary field research project in Indonesia (coordinated by the author), that included screening of wild captured and pet macaques for retroviruses, assessed adult onset diabetes risk, enabled genetic comparisons, and provided surveys of the conservation status of wild populations. The "Great Ape Aging Project" (JME, PI) identified the oldest great apes in US zoological gardens and research colonies and attempted to support and noninvasively monitor their health and behavior. When apes died their brains were obtained, archived, and studied in great detail for possible evidence of neurodegenerative pathology. The existence of the "Comparative Neurobiology of Aging Resource" has enabled many very detailed comparisons of human and nonhuman primate brains. Finally, a data mining "Cortisol and Aging Project" is described that examined longitudinal data from a colony of rhesus macaques maintained for many years by Dr. Barbara Hansen for the study of naturally occurring adult onset diabetes. The author examined fasting AM cortisol values cross-sectionally for all available specimens and, longitudinally, for 30 individuals. Remarkably, the cross-sectional relationship between age and cortisol in macaques was identical to that reported from a large epidemiological study of humans. Even so, individual profiles were highly variable, with few individuals showing progressive increases in cortisol with age. This result calls into question the application to individuals of generalizations about populations, and supports the value of more individualized medical approaches. The four projects described here clearly show how valuable integrated multidisciplinary and interdisciplinary collaboration can be, and how productive such approaches are in fulfilling the promises of primatology.

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