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Females Are Dominant Sex, Primate Study Suggests

James Owen in England for National Geographic News November 25, 2003

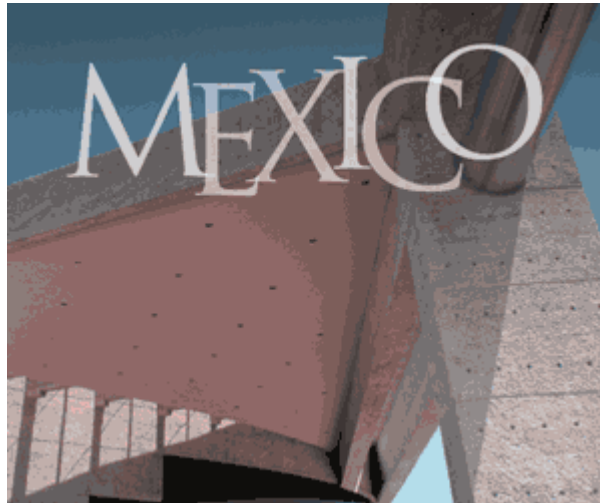
Feminists might be surprised to hear it, but females are the dominant sex in most primate communities. Far from being passive bystanders in a world governed by machismo, a new study suggests females may determine social evolution in primates.

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Researchers believe that "girl power" may not be a new phenomena. A recent study shows that females led the way in the evolution of social relationships among primates.

Photograph courtesy Anna & Patrik Lindenfors



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Researchers based in the U.S. and Sweden who analyzed evolutionary change in groups of primates found the numbers of males lags behind females. The number of females in a group tends to be larger than the number of males; the more females there are the more males there will be, but only after a period, when the males have had time to catch up to the changing population.

As mixed-sex, multi-male groups are common in more advanced primate societies (including humans), scientists say the study highlights the importance of females in understanding social evolution.

The time lag between numbers of females and males was revealed using a family tree (or phylogenetic tree), with various branches showing relatedness between species.

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"A simple example is the relationship between us and chimps which looks like a V," said Patrik Lindenfors, a zoologist at the University of Virginia, Charlottesville. "Chimps are on one tip of the V, with us on the other, and our common ancestor at the bottom. The branches are the lines that connect the three."

Lindenfors and his team also used information on the approximate dates species diverged to work out group composition among their ancestors. "For example, the common ancestor of chimps and humans most probably was group-living because both chimps and humans are group-living," he added.

Such a reconstruction of ancestral group sizes would show one of the following patterns: no relationship between male and female numbers and social evolution, change being driven by either males or females, or the sociality of both sexes evolving in unison.

Lindenfors added: "If one sex drives social evolution then when a change happens to the group composition of this sex, for example the average number of females in a group increases, the other group would change as well, but with a time lag."

This is exactly the scenario the researchers found, with changes in the number of males consistently lagging behind females. Their findings are now published online in the scientific journal *Biology Letters*.

Baboons and Chimps

Almost 40 primate species were covered by the study. They included baboons, chimpanzees, and macaques—all known to live in large, mixed-sex groups.

So why should it be females that first seek to live in larger societies?

Scientists believe communal living is particularly beneficial to females because a ready food supply is crucial for successful reproduction. A primate "sisterhood" would be better equipped to locate and defend food resources than individual animals. Similarly, the risk of predation is reduced if others are keeping a watchful eye.

But for males access to females is considered the major factor influencing reproductive success. Unlike females, which must gestate then rear their offspring, males can breed any time, and the more matings the better. So operating as an unattached "free agent" may be the best approach.

Lindenfors said: "The number of females that they can impregnate is what matters most for reproductive success." But, he adds, "the males should go where the females are."

This last quote refers to the work of behavioral ecologist Jeanne Altmann, who coined the expression. While a single dominant male can monopolize more than one female, Altmann suggested this could be disadvantageous to females because of increased female breeding competition and the danger of outside males killing young they know not to be their own.

Altmann and others suggest females that manage to attract more

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males to their group would increase mate choice and reduce levels of infanticide. Studies also indicate males are better at detecting and defending against predators.

To pull in additional males there would have to be more females in a group than the alpha male could manage. As numbers grow, his chances of hanging on to his harem lessen. Scientists believe females develop sexual strategies to make this scenario more likely.

More Males

Peter Kappeler, president of the European Federation of Primatology, provides an example, saying, "Females can synchronize their receptive periods. If all females of a group become receptive within a short period of time, it becomes increasingly difficult for a particular male to monopolize matings. As a result most females are able to mate with several different males."

However, researchers say synchronized estrus and other adaptations geared towards multi-male, mixed-sex group living would take time to evolve, so male numbers would lag behind. Males would also have to learn to live together while in female company. Then there's the problem of sexually-transmitted diseases, says co-author Charlie Nunn, an evolution and ecology researcher at the University of California, Davis.

Nunn said: "As the number of females in a group increases, there tends to be more males, and with this social system promiscuous mating commonly occurs. This may favor the transmission of STDs, along with many other directly transmitted pathogens." He says this would slow the evolution of larger, multi-male groups.

If females drive social evolution in primates, what about humans? To what extent have female ancestors shaped human society, and if ancient man had it his way how differently would we be living today?

Scientists say these are difficult questions, but Kappeler adds, "This and similar studies are relevant to understanding human social evolution in that they identify general principals which should have affected the evolution of human social behavior."

So when it comes to our own origins, perhaps "girl power" isn't a 20th-century invention after all.

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