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# Deep male voices not so much sexy as intimidating

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Male voices are not deeply pitched in order to attract female mates, but instead serve to intimidate the competition, according to a team of researchers studying a wide variety of primates including humans.

"We wanted to determine if sexual selection had produced sex differences in humans and closely related species," said David A. Puts, associate professor of anthropology, Penn State. "If similar vocal sex differences appear across species with similar levels of mating competition, then we infer that sexual selection produced these sex differences."

The researchers conducted three studies and found that a deep-pitched male voice was seen as dominant by other males, but had a smaller impact on attracting females. They also found that the sexual dimorphism of vocal pitch—how different the two sexes were—was greater in humans than in any other ape species measured in their study. They report their results in a recent issue of the *Proceedings of the Royal Society B*.

"We find that masculine traits in humans are not the same as, say, in peacocks where the beautiful tail attracts a mate," said Puts. "For example, beards make men more dominant looking, scarier and seemingly more dangerous, but most women prefer clean-shaven men." Human male traits imply physical aggression and formidability and seem to provide competitive advantages in fighting or threatening other men more than they help attract women.

The researchers first looked at the fundamental frequency of male voices across the anthropoid primates—those most closely related to humans, including gorillas, chimpanzees and orangutans. Fundamental frequency is the average rate of vocal-fold vibrations. They used 1,721 vocal calls, free of background noise, from individuals of known species, sex and adult status. They used mating systems —monogamous, promiscuous or polygynous—as a proxy for the intensity of sexual selection. Promiscuity differs from monogamy and polygyny in that females more frequently have multiple sex partners, which makes predictions of sexual dimorphism more difficult. In polygynous species, some males can monopolize many mates leaving other males unmated. This tends to make sexual selection more intense in polygynous species than in monogamous ones. Anthropologists classify humans as moderately polygynous.

The researchers found that the differences in fundamental frequency between sexes decreased toward monogamy and increased toward polygyny.

Next the researchers looked at 258 female and 175 male college students who read a standard passage that was recorded without any background sounds. Then 558 women and 568 men rated the recordings. Each female recording was rated by 15 men for the potential for short- and long-term romantic attractiveness using a standard rating system. Each male recording was rated by 15 men for dominance and 15 women for short- and long-term romantic attractiveness.

The researchers found that fundamental frequency predicted men's perceived dominance over other men, and to a lesser degree their attractiveness to women, but that it did not predict women's attractiveness to men for either short- or long-term romantic relationships. The researchers then recorded 53 women and groups of 62 and 58 men and tested their saliva for cortisol and testosterone. In

women, there was no connection between vocal pitch and either cortisol or testosterone.

"For both groups of men, high testosterone levels and low cortisol levels occurred in men with low fundamental vocal frequency" said Puts.

This is a pattern that has been shown to predict male dominance, attractiveness and immune function.

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