



A female finch studies two males (photo-Sarah Pryke)

ScienceWatch – Mom’s Perception of Dad Determines Her Children’s Sex

“Over eighty percent of Gouldian finch chicks will be male if their mother *sees* that the father has a different head color.” – S. Pryke.

The Gouldian finch (*Erythrura gouldiae*) is a beautiful Australian bird that comes in two main color varieties, black-headed (70%) and red-headed (30%). Female finches prefer to mate with a male of the same head color. But the birds are endangered—only a few thousand exist in the wild—and mismatched matings

often occur because birds can’t find matched mates. When that happens genetic incompatibility causes many offspring, but especially the females, to die (84%) before they can breed.

Given such a grim outcome, Sarah Pryke and Simon Griffith, Macquarie University, Sydney, Australia wondered whether breeding females could improve the success of their progeny by influencing the sex of their chicks.

Writing in the March 20, 2009 issue of *Science*, they show that when female finches are forced to mate with a mismatched male, they dramatically alter the sex ratio of their children in favor of the sex more likely to survive—the males. Even more surprising, these changes are brought about by what the mother sees when she looks at the prospective father.

Pryke and Griffith took 100 black-headed and 100 red-headed female finches raised in captivity and mated half of both groups to mismatched males. The other half was mated to males of the same color. Once the chicks reached independence, they and the male were removed and each female was mated to a male of the alternate color. Thus, each female was mated twice, once to a matched male, once to a mismatched male.

The researchers expected the birds would enhance their reproductive success by producing more males from the mismatched matings; nevertheless, the results were unexpected. While the sex ratio of chicks from matched matings approached 50:50, mismatched matings yielded a huge preponderance of males. “We expected some influence on sex ratio, but it was a surprise to find that 82.1 per cent of the offspring were male”, says Pryke. In addition, females in mismatched matings put less time and energy into their doomed brood, by laying fewer and smaller eggs, and feeding the chicks less often.

To determine if the skewed sex ratio was due to some genetic incompatibility or under control of the female, the scientists painted some red-headed males black. When they did “matched” and “mismatched” matings to the painted males, they were astonished. Black-headed females mated to black-headed males that were natural redheads yielded a progeny sex ratio approaching 50%, just as if they had performed a matched mating. By contrast, red-headed females mated to the blackened red-headed males produced a skewed progeny sex ratio (72% males), even though their mates were genetically matched. Moreover, these females also invested less time and energy in their clutch even though the “mismatch” was due to the right male painted the wrong color. Females who were fooled into making a “matched” mating cared for their chicks as they normally would, but they could not overcome the existing genetic incompatibility. Their daughters still died at a higher rate than when the match was true.

The idea that females can control the sex of their progeny is not new and others have done studies to indicate it may occur – see – *ScienceWatch - House finch Adaptability: Mother Knows Best!* (September 2002). However, this is the first clear-cut case of a mother influencing the sex of her offspring by what she thinks the father looks like.

“We still don’t understand how she is doing it”, says Pryke.