

Females compensate for unattractive partners

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The zebra finch forms long-term pair bonds. Female zebra finches pull out all the stops to compensate for the shortcomings of unattractive partners. Image: Max Planck Institute for Ornithology

(PhysOrg.com) -- Attractive males promise quality offspring. Most female birds therefore invest a lot of energy in their attempts to breed with attractive partners. Not so the female zebra finch. If they have unattractive male partners, the females lay particularly big eggs that contain a lot of nutrients. Because the finch pairs stay together for their entire lifespan, the female has no reason to save up resources for a subsequent and better partner. The low genetic quality of the male is compensated for by good egg quality, as discovered by the scientists at the Max Planck Institute for Ornithology in Seewiesen.

Female birds usually breed several times over the course of their lives.

At each breeding attempt they face the question as to what level of resources they should invest in the process. The genetic quality of their breeding partners plays an important role here as attractiveness is associated with the promise of healthy offspring. If the male bird is particularly attractive, the females summon up a particularly high level of energy for their breeding attempts. As a result, the eggs are relatively large or contain a particularly high level of nutrients like carotenoids, for example.

However, as the scientists at the Max Planck Institute for Ornithology in Seewiesen have discovered, in the case of zebra finches, the opposite approach can also be advantageous. The explanation for this lies in the way in which zebra finches live together: the couples usually remain together for their entire lifespan and are, therefore, monogamous. Thus, it does not pay for the females to economize with their resources as there is little likelihood that they will team up with a real "superman" for their next breeding attempt.

In order to find this out, Elisabeth Bolund in Seewiesen paired females with two different males at intervals of four months. One of the males was known to the researchers to be particularly attractive from previous experiments, while the other was viewed as particularly unattractive. Attractive males had other "affairs" in addition to their relationships with their "permanent" partners - and thus fathered significantly more offspring.

When a female was placed in a cage with an unattractive male, she laid particularly large eggs with more contents than the egg she laid when paired with a highly attractive male. Thus, in the experiment, the female zebra finches pulled out all the stops for the unattractive males: "The offspring require more 'seed capital' as the partner does not provide as much quality," explains Elisabeth Bolund. "The female tries to compensate for the deficits her male partner brings to the long-term pair

bond." Similar behaviour has already been observed among other bird species, for example the house finch (*Carpodacus mexicanus*), which also belongs to the finch family.

Citation: Elisabeth Bolund, Holger Schielzeth and Wolfgang Forstmeier, Compensatory investment in zebra finches: females lay larger eggs when paired to sexually unattractive males, *Proceeding of the Royal Society B*, November 5th, 2008; doi:10.1098/rspb.2008.1251

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