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Cuckoldry



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Synonyms

[Cuckoldry risk hypothesis](#); [Paternity uncertainty](#);
[Sexual infidelity](#)

Definition

Female internal fertilization has posed the adaptive problem of cuckoldry, or being deceived into providing resources or investment in genetically unrelated offspring, for males across species. Cuckoldry is an adaptive problem for males because investing in a rival's offspring rather than one's own is reproductively devastating, especially for males of high-investing species. Consequently, males in species in which female internal fertilization occurs have evolved anti-cuckoldry tactics.

Introduction

In externally fertilizing species, such as most species of fish, males can be certain of their paternity, and their paternal investment will not benefit

a rival's offspring because external fertilization allows males to witness the fertilization of a female's eggs (Trivers 1985). Cuckoldry, or being deceived into providing investment into genetically unrelated offspring, is an adaptive problem that males face primarily in species in which fertilization occurs within the female, such as humans, cats, and reptiles. Although males may be cuckolded in externally fertilizing species (Jones et al. 2001), the likelihood of paternity uncertainty is lower and less consequential in terms of reproductive costs than for paternally investing males in species with internal fertilization. Internal fertilization affords females the certainty that they are the genetic parent of the offspring they produce. From an evolutionary perspective, females benefit from internal fertilization in part because they can deceive males into providing paternal investment, such as provision of resources and physical protection, in offspring to whom they are not genetically related while producing these offspring with genes contributed by, for example, a genetically higher-quality male. In these circumstances, females may secure "good genes" from one male and investment from the cuckolded male. Cuckoldry thus can be reproductively beneficial for the female and the genetic sire of offspring, while it is extraordinarily costly and rarely beneficial for the cuckolded male.

The Problem of Cuckoldry

Given the amount of time and resources males invest in females and their offspring, it can be

reproductively devastating for a male to be deceived into allocating paternal investment to an offspring to whom he is not genetically related (Platek and Shackelford 2006). In species, such as humans, in which males provide nontrivial, and sometimes substantial, parental care, cuckoldry is especially reproductively costly. Specifically, when a female's egg is fertilized by another male, the cuckolded male will fail to have sired the resulting offspring and, moreover, will invest resources into a rival's offspring. In some instances, cuckoldry can be costly for *both* males and females. One study reported that sand goby (*Pomatoschistus minutus*) males may sneak to fertilize eggs, thereby preventing the desired male from achieving fertilization and disrupting female-driven sexual selection processes (Jones et al. 2001).

Solutions to the Problem of Cuckoldry

To address or avoid the costs associated with cuckoldry, males of many species have evolved anti-cuckoldry tactics that may lower the risk of cuckoldry. For example, male tropical house wrens (*Troglodytes aedon*) may be able to identify paternity markers in eggs laid by females (Freed 1987). Specifically, Freed (1987) examined male destruction of eggs laid after the appearance of new males, finding that resident males appear to be able to identify paternity by behaving differently toward eggs introduced after the new males appeared – in some cases, destroying the eggs if the new male was introduced during the female's fertile period. However, when resident males spent more time with the female during her fertile phase, they were less likely to engage in egg destruction, suggesting that greater resident male vigilance of the female lowers the risk of cuckoldry. Thus, mate guarding, or occupying the female's time and engaging in surveillance of her sexual behavior, is an anti-cuckoldry strategy that males use to lower the likelihood that the female will copulate with other males, thereby preventing cuckoldry. By entering long-term relationships or pair-bonds with females, males can guard the female more frequently or vigilantly

and have more opportunities to copulate with her, increasing the likelihood that the offspring she produces are not sired by rival males (Strassmann 1981). Mate guarding is often costly in terms of time and resources, however.

Human males also use a variety of mate retention tactics, or behaviors that discourage a partner from engaging in sexual infidelity or leaving the relationship, to reduce the risk of cuckoldry (Buss 2002). These behaviors range from vigilance over a female partner's whereabouts to physical or sexual violence against the female. For example, Kaighobadi et al. (2008) reported that accusations of female infidelity predicted men's violence against their partner. Because female infidelity sometimes results in cuckoldry, men sometimes use violence against their partner to discourage them from committing infidelity.

Males may also sometimes *engage* in sperm competition, a process in which sperm from two or more males compete to achieve fertilization of the female's egg, to reduce the risk of cuckoldry. In humans, males engage in more frequent in-pair copulation and mate guarding behavior when they spend less time with their partner since the couple last copulated (Shackelford et al. 2006). Males that are unable to guard a female partner during her fertile phase risk cuckoldry. In instances of greater time spent apart since last copulation, males increase in-pair copulation frequency to engage in sperm competition, reducing the likelihood of conception by a rival male. However, in some circumstances, males engage in sexual coercion to increase in-pair copulation frequency. The cuckoldry risk hypothesis for sexual coercion suggests that sexual coercion is a male tactic used to reduce paternity uncertainty (Camilleri and Quinsey 2009). Specifically, when a male's perceived risk of partner sexual infidelity (and consequent cuckoldry) is higher, they are more likely to sexually coerce their partner, suggesting that *engaging* in sperm competition via coerced intercourse may decrease cuckoldry risk. An additional study investigating 26 species of birds found that males copulated more frequently if the risk of sperm competition

was higher, indicating that birds engage in frequent copulation to lower the risk of paternity uncertainty by engaging in sperm competition (Møller and Birkhead 1991).

Conclusion

Female internal fertilization presents the adaptive problem of cuckoldry for paternally investing males, whereas females may reproductively benefit from internal fertilization by deceiving males into providing care for offspring sired by, for example, genetically superior males. Cuckoldry is an adaptive problem for males because cuckoldry thwarts the male from producing his own genetic offspring, thereby failing reproductively, and causes him to squander his time, resources, and investment in a rival's offspring. As such, males have evolved anti-cuckoldry tactics to lower the risk of cuckoldry, including mate guarding, mate retention tactics, and tactics that motivate participation in sperm competition.

Cross-References

- ▶ [Extra-Pair Copulation](#)
- ▶ [Mate Guarding](#)
- ▶ [Sperm Competition](#)

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