How to Rescue the Concorde Fallacy

In a recent issue of *TREE*, Coleman and Gross[1] claim that if life history theory is incorporated, it appears that the Concorde fallacy, originally proposed by Dawkins[2], is itself a fallacy. They conclude that 'There is no role for the Concorde fallacy in understanding parental-investment theory'.

In this last comment they may be right. However, the idea is not new. Dawkins, in *The Extended Phenotype*[3], had earlier observed that while digger wasps seemed to commit the Concorde fallacy, it might be that 'what appeared to be maladaptive was better interpreted as an optimum, *given certain constraints*' (p. 48, Dawkins' italics). What Coleman and Gross propose is essentially the same idea: if certain constraints are taken into account, it appears that committing the Concorde fallacy may indeed be the best option.

Coleman and Gross discuss the Concorde fallacy in relation to the entire lifespan. We think that the Concorde fallacy is at its most relevant in short-term studies of decision making, not in studies involving entire life histories. If the entire lifespan of an individual is considered, it may often appear that constraints and compensatory mechanisms influence behaviour more than instantaneous cost–benefit assessments. The Concorde fallacy can only work on relatively short time scales. It should also only be applied to a certain well-defined activity, not to a complex aggregate of behaviours – which an entire lifespan inevitably is.

We propose a new definition for the Concorde fallacy: an animal is said to commit the fallacy if it continues *a certain well-defined activity* even after the cost associated with this activity exceeds the benefit. An entire lifespan is not such a well-defined activity. Wrong decisions made during a certain activity may be compensated for later by *decisions in another activity*. The Concorde fallacy only works within the particular well-defined activity; its logic has nothing to do with the possible future compensation. If a mistake is made in a momentary investment decision, it still remains a mistake even though it could be compensated for later. We therefore think that it is not valid to criticize the logic of the Concorde fallacy on the basis of entire life history considerations.

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References

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Reply from R.M. Coleman and M.R. Gross

Jokela and Vuorisalo raise three points. First, they suggest that our interpretation[1] of past investment is similar to that of Dawkins[2]. This is not true. Dawkins' discussion concerned the fighting behaviour of digger wasps[3]. Imagine that a burrow provisioned with five katydids (5K) received 2K from wasp A and 3K from wasp B. Dawkins and Brockmann[3] initially expected that A and B should fight equally hard to possess the burrow, since they felt that its value was equal to each wasp, namely 5K. Dawkins' interpretation (Ref. 2, pp. 48–49) of why wasp B actually fights harder was that sensory constraints limit its ability to assess the 5K in the burrow, so past investment is used to estimate the burrow's value. B fights harder because it calculates that the burrow contains more katydids (3+) than wasp A (2+). In contrast, we maintain that a much more general principle is in operation. The life history prediction, as Fagerstrom[4] also pointed out, is that B should fight harder because of its greater past expenditure of lifetime resources (e.g. time and energy) in provisioning the burrow. According to the relative value rule of life history theory[5], the burrow's value is greater for B than for A because of B's reduced potential for collecting Ks. Even if both wasps had the precise knowledge that the burrow contained 5K, B should fight harder because to it 5K is worth more. Past investment changes the value of the current pay-off. Using past investment is not a fallacy, nor maladaptive!

The second point questions whether life history theory applies to instantaneous cost/benefit assessments of well-defined activities. Absolutely! As an additional example to the digger wasp, the defense of offspring against predators by bluegill sunfish, a well-defined activity, is best understood by instantaneous cost/benefit assessment in which the cost and benefits incorporate the relative value rule[6].

The third point is that a new definition would rescue the Concorde fallacy. Since life history trade-offs are such an important part of understanding biology, redefining the Concorde fallacy to exclude this principle seems to us to be of little value.

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Note

The typesetting error in Box 2 of the original paper by Coleman and Gross (*Trends Ecol. Evol.* 6, 404–406) is corrected on p. 36 of *Trends Ecol. Evol.* 7 (February issue, 1992).