Manipulative begging by parasitic cuckoo nestlings and paradoxical host behaviour

In his News & Comment1 on a study by Davies et al. about begging in cuckoos, Lotem raises issues that deserve further attention. Davies et al. identified the begging call of European cuckoo (Cuculus canorus) nestlings as a super-normal stimulus (roughly defined as a stimulus that is more intense than the whole brood norm) that is capable of coevolving anti-rejection responses. This coevolutionary process is thought to have driven the evolution of handicap, eliciting preferential care by hosts by numerical inferiority that could compensate for their parasites handicapped by their odd appearance or size, growth or predation risk. However, as for the effect of food share is difficult to identify, conclusively because cuckoos and nestlings may differ in other relevant ways (e.g. perception, constraint) that nobly affects host preferences. Namely, cuckoos pretend to be normal nestlings instead of a single high-quality one. However, the new discovery is not consistent with the MM (Model of Manipulative Interference Model, MIM)" that was resistant to evolutionary modification (because of, for example, perceptual constraints) would work equally well. This suggests a major role for the specific trick used by the cuckoo is different from the traditional one, to the problem of host preference. My suggestion that Davies et al. studied an expression of genetic parent–offspring conflict8, that is puzzling that hosts even tolerate the parasite, let alone favour it. The Manipulative Interference Model (MIM) distinguishes two signals exaggerating traits that honestly covary with need while cuckoos parasitic nestlings are expected to provide a different answer from the traditional one to the problem of host preference. Namely, cuckoos pretend to be several normal nestlings instead of a single high-quality one. However, the new discovery is not consistent with the MM model. In fact, although the specific trick used by the cuckoo is different from the traditional one, it is puzzling that hosts even tolerate the parasite, let alone favour it. According to the Manipulative Interference Model (MIM), those parasites that compete with the host young2,6. However, because we cannot determine if this is the only reason; perhaps there are additional ones. Being satisfied with the immediate and obvious explanation, as suggested by Redondo, might not be the most productive methodology, because it weakens the motivation to consider alternative or to look for additional factors. Redondo is correct in predicting that my idea will not work in systems where the parasite is raised alongside the host's own young and cannot monopolize the benefit of its begging efforts. But perhaps this is the reason that mimicking a brood is performed by the single chick of the common cuckoo, rather than by parasites that compete with the host young4. If the suggested asymmetry can lead to different manipulative strategies among brood parasites (where `y' is always zero), a similar effect on begging differences between a single cuckoo and a host young is likely, irrespective of the difference in `y' and its additional effect. More important, although the idea was inspired by the case of the cuckoo, such an asymmetry in securing a benefit share of collective begging might be found in many normal broods, where cuckoos and differences in `y' are irrelevant.

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References


Reply from A. Lotem

I welcome Redondo’s clarification that Davies et al. ‘‘new finding’’ can be viewed as a specific case of his Manipulative Interference Model (MIM). My suggestion that Davies et al. study provides a different answer related to the precise way in which cuckoo chicks manipulate their hosts, not in questioning whether they do so. Regarding the title question of my article ‘‘Why should true offspring not do the same?’’ there is no doubt that because of the lack of genetic relatedness parasitic nestlings are expected to beg more2,6. However, because we cannot feasibly predict how much more, we cannot determine if this is the only reason; perhaps there are additional ones. Being satisfied with the immediate and obvious explanation, as suggested by Redondo, might not be the most productive methodology, because it weakens the motivation to consider alternative or to look for additional factors.

Redondo is correct in predicting that my idea will not work in systems where the parasite is raised alongside the host’s own young and cannot monopolize the benefit of its begging efforts. But perhaps this is the reason that mimicking a brood is performed by the single chick of the common cuckoo, rather than by parasites that compete with the host young4. If the suggested asymmetry can lead to different manipulative strategies among brood parasites (where ‘y’ is always zero), a similar effect on begging differences between a single cuckoo and a host young is likely, irrespective of the difference in ‘y’ and its additional effect. More important, although the idea was inspired by the case of the cuckoo, such an asymmetry in securing a benefit share of collective begging might be found in many normal broods, where cuckoos and differences in ‘y’ are irrelevant.

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References