Reply to Eens et al.

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LETTER

Reply to Eens et al.: Urban noise can alter sexual selection on bird song

Eens et al.(1) question (*i*) whether our data are sufficient to state that low-frequency songs are sexually selected and (*ii*) whether anthropogenic noise really affects male–female communication, as males may just get closer to make their songs more audible.

In reply to the first criticism, we do not see any reason in their arguments that would raise doubts about whether our statistical reality is reflecting a biological reality. We performed an adequate test on 22 male great tits and found cuckolded males to sing higher-frequency songs compared with noncuckolded males (2). Furthermore, although we could not assign the genetic fathers for all chicks in our study, we do not think it is premature to conclude that reproductive success is related to spectral performance, as it is unlikely that the loss of own-pair paternity is compensated by a gain in extrapair paternity.

It is important to realize that male great tits likely run the highest risk of losing paternity just before the start of egg-laying. We found female nest-box emergence times at this time point to be related to female fidelity (2). Our data further suggest that the time window to escape mate guarding before sunrise is very small and possibly constrained by egg-laying itself. Females do not leave their nest box as early when they have started laying eggs (2). It is also known that eggs can be fertilized by sperm stored before laying (3) and that extrapair chicks are mainly found in the first-laid eggs (3, 4). These data are all in line with a crucial period for paternity guarding just before laying, and this may explain why male peak with song performance especially at this time.

Furthermore, our spectral measure not only included whether males could sing low-frequency song types, but also how often they did. We found that noncuckolded males used the lowest song types from their repertoire more often than cuckolded males. Furthermore, several cuckolded males from our study possessed very low song types, but did not use these when it counted most, 1 d before laying. Importantly, male great tits respond to anthropogenic noise masking by reducing the bout duration of low-frequency song types in particular (5), which suggest a direct restriction of environmental noise conditions on optimal performance for song type use in male–female communication.

In reply to the second criticism, we agree that male approaching behavior during interaction with calling females could be a novel strategy to reduce the impact of masking, and we have investigated this hypothesis in a forthcoming study. However, males spent most of predawn singing from a small number of perches, during which time they occasionally receive feedback from females (6). Our experimental data show that, under these singing conditions, low-frequency song types will be most affected by noise and will be outcompeted by high-frequency song types in eliciting a female response.

To conclude, although we also would like to see more work on the underlying causal and functional relationships between song frequency use and female fidelity, our data do show that urban noise can alter sexual selection pressures acting on bird singing behavior.

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The authors declare no conflict of interest.

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