**ON SCIENTIFIC INTEGRITY**

A mini-review of problematic omissions in

**Extremely loud mating songs at close range in white bellbirds**

Podos and Cohn-Haft (2019)

Two science journalists have independently pressed me for comments on this paper. Here I review three significant omissions of information from the published literature that conflict with the authors’ interpretation of their data.

The core issue is one of “scientific integrity,” as defined by Nobel Laureate physicist Richard Feynman:

But there is one feature I notice that is generally missing in Cargo Cult Science.  That is the idea that we all hope you have learned in studying science in school—we never explicitly say what this is, but just hope that you catch on by all the examples of scientific investigation.  It is interesting, therefore, to bring it out now and speak of it explicitly.  It’s a kind of ***scientific integrity***, a principle of scientific thought that corresponds to ***a kind of utter honesty***—a kind of leaning over backwards.  For example, ***if you’re doing an experiment,*** ***you should report everything that you think might make it invalid—not only what you think is right about it***: other causes that could possibly explain your results . . .  (emphases mine; excerpted from Feynman’s 1974 commencement address at Caltech, available [here](http://calteches.library.caltech.edu/51/2/CargoCult.htm)).

Routinely (abundant examples in Kroodsma 2017ab[[1]](#endnote-1)), Podos selectively omits key information from his publications, thereby distorting the research message and deceiving readers into believing something substantial has been accomplished, when in fact it hasn’t.

So the first thing I ask when looking at this Current Biology paper by Podos is this: “What has been omitted this time?”

**OMISSION 1.**

**Published literature:** The three-wattled bellbird (*Procnias tricarunculata*), a close relative of the white bellbird, is renowned for its excruciatingly loud sounds delivered at close range, 10-15 cm from the listener (e.g., Snow 1977, Kroodsma et al. 2013).

**The omission**: Podos and Cohn-Haft declare that “We know of no other species [besides our white bellbird, *Procnias albus*] in which such high-amplitude vocal signals are directed to receivers in such close proximity.”

In view of all that is known about other bellbirds, and especially the three-wattled bellbird, that quote is astonishing.

**OMISSION 2.**

**Published literature:** In both the white bellbird (Snow 1973)[[2]](#endnote-2)and the three-wattled bellbird, males frequently visit each other’s perches. The males are also “blown away” by intensely loud calls/songs in their faces. Distances between the three-wattled bellbirds are not the “less than four meters” as described for white bellbirds, but more on the order of 10-15 cm. One reason for these close encounters by male three-wattled bellbirds is undoubtedly to learn the micro-details of ultra-soft (and loud) vocalizations that all males in the population continuously learn and relearn. This learning process then results in continuous, synchronized changes over the years in the learned songs of all singing males in the population (Kroodsma et al. 2013), a remarkable phenomenon that has not been documented in any other birds, not even the song-learning songbirds.

**The omission**: Podos and Cohn-Haft omit all mention of male-male interactions at the calling perches and the song learning that undoubtedly occurs there. Instead, they mention only female visits, focusing exclusively on presumed female assessment and sexual selection[[3]](#endnote-3).

More astonishment. Could Podos and Cohn-Haft have been unaware of work on the other bellbirds (both omissions 1 and 2), even on their own study species? That is challenging to believe. When they needed a rather obscure factoid on all four species of bellbirds, for example, they knew it, stating in the supplemental material that individual males of all four species routinely return to their own perch. Maybe the short nature of the communication required by Current Biology is to blame for omitting information? No, that’s not an acceptable excuse, as supplemental material has no such constraints.

**OMISSION 3.**

**Published literature:** “*Extensive laboratory data show that birds are much more resistant to hearing loss, auditory damage, and decline in vocal quality from acoustic overexposure than are humans and other mammals*” (Dooling et al. 2019). The middle ears of birds are unlike mammalian ears, as they are connected by an interaural canal, and, in a number of species (bellbirds would not be special), it appears that the pressure in this canal can be modulated by way of the Eustachian tube, thereby mitigating potential damage from loud sounds (Larsen et al. 1996).

**The omission**: No mention of the unique features of avian ears. The only concern is for females who, driven by sexual selection, risk hearing loss.

The tall tale gets taller.

**SUMMARY**

1) By omitting reference to three-wattled bellbirds, Podos and Cohn-Haft establish that they have something exclusive and truly exciting, something beyond anything that has been known before, discovered during expeditions to remote stretches of the Amazon.

2) By omitting all reference to male-male interactions and song learning, the story can become one of sexual selection, of males who are performing at their maximum and discriminating females who are assessing them (though, of course, there are no data).

3) By omitting routine knowledge of avian hearing, Podos and Cohn-Haft are able to spin a fantastical tale of the astounding power of “sexual selection’s power to drive evolution,” with females so intent on assessing males that they risk hearing damage.

The cumulative result of the cascading omissions is a sensational story on sexual selection, so well spun that it is picked up by science journalists everywhere and broadcast to the public.

**ON SCIENTIFIC INTEGRITY AND FRAUD**

Publications in which conflicting information has been intentionally omitted, thereby distorting the research message and deceiving readers, are considered fraudulent. See [encyclopedia.com](https://www.encyclopedia.com/history/dictionaries-thesauruses-pictures-and-press-releases/scientific-fraud) for the following quotes:

*The term ‘scientific fraud’ is used to describe intentional misrepresentation of the methods, procedures, or results of scientific research.*

*More prevalent and more vexing than outright fabrication is the “fudging” or “massaging” of data . . . A related offense occurs when researchers “cook” or “finagle” data by reporting only part of their findings, while omitting to report data or experimental results that do not support their conclusions.* ***By today’s standards, omission of data that inexplicably conflicts with other data or with a scientist’s proposed interpretation is considered scientific fraud.***

**References**

Dooling, R. J., D. Buehler, M. R. Leek, and A. N. Popper. 2019. The impact of urban and traffic noise on birds. Acoustics Today 15:19-27.

Kroodsma, D. 2017a. Birdsong performance studies: A contrary view. Animal Behaviour 125: e1-e16. Pdf is available [here](http://donaldkroodsma.com/wp-content/uploads/2017/02/Kroodsma_2017_forum.pdf).

Kroodsma, D. 2017b. Birdsong performance studies: a sad commentary. Animal Behaviour 133: 209-210. Pdf is available [here](http://donaldkroodsma.com/wp-content/uploads/2017/12/Birdsong-performance-studies-a-Sad-Commentary.pdf).

Kroodsma, D., D. Hamilton, J. E. Sánchez, B. E. Byers, H. Fandiño-Mariño, D. W. Stemple, J. M. Trainer, and G. V. N. Powell. 2013. Behavioral evidence for song learning in the suboscine bellbirds (*Procnias* spp.; Cotingidae). Wilson Journal of Ornithology 125:1-14. Pdf is available [here](http://donaldkroodsma.com/wp-content/uploads/2014/01/Three-wattled-Bellbird-2013-Wilson-Journal.pdf).

Larsen, O.N., R. J. Dooling, and B. M. Ryals. 1996. Roles of intracranial air pressure in bird audition. In: Diversity in Auditory Mechanics. (E. R. Lewis, G. R. Long, R. F. Lyon, P. M. Narins, C. R. Steele & E. Hecht-Poinar, eds.), pp. 11-17, World Scientific: Singapore, New Jersey, London, Hong Kong.

Podos, J. 2017. Birdsong performance studies: Reports of their death have been greatly exaggerated. Animal Behaviour 125: e17-e24. Pdf is available [here](http://donaldkroodsma.com/wp-content/uploads/2017/02/Podos-Kroodsma_2017_forum.pdf).

Podos, J., and M. Cohn-Haft. 2019. Extremely loud mating songs at close range in white bellbirds. Current Biology 29, R1055-R1069. Pdf is available [here](https://www.dropbox.com/s/vls37u2pq1poubv/Podos%20and%20Cohn-Haft.pdf?dl=0).

Snow, B. K. 1973. Notes on the behavior of the white bellbird. Auk 90: 743-751. Pdf is available [here](https://sora.unm.edu/sites/default/files/journals/auk/v090n04/p0743-p0751.pdf).

Snow, B. K. 1977. Territorial behavior and courtship of the male three-wattled bellbird."Auk 94: 623-645. Pdf is available [here](https://sora.unm.edu/sites/default/files/journals/auk/v094n04/p0623-p0645.pdf).

Snow D. 1982. The Cotingas. Oxford University Press. New York, New York.

1. Yes, Podos (2017) will claim that he fully refuted my critique, but, again, what he omitted in his response is telling: Never were the issues of scientific integrity addressed head on. Anyone who wishes to read more about these issues can go [here](http://donaldkroodsma.com/?page_id=1596) or, more specifically, [here](http://donaldkroodsma.com/wp-content/uploads/2018/01/Bullshit-is-Scientific-Fraud-A-Response-to-Podos-1.pdf). [↑](#endnote-ref-1)
2. Quotes from Snow (1973): *A calling male is often visited by other males, both adults and immatures. . . . The occupying male* [the visited male] *finally utters a bell call* [the loudest call] *with a swing from right to left and so directly toward the visitor. The visitor reacts by fluttering several feet away or flying right away. If he only flutters a few feet, he often returns and the performance is repeated a number of times.* [↑](#endnote-ref-2)
3. Quotes from Podos and Cohn-Haft (2019) reveal their exclusive focus on female sexual selection, *in the absence of any data*. Males perform at their maximum and the females even risk hearing loss in order to acquire the details of a male’s show that he puts on just for her! Sample quotes: *“ . . . mating songs . . . sexual selection . . . signalers convey, and receivers discern, information about signaler quality . . . bellbird females . . .intense sexual selection . . . performance capacities . . . strong and persistent sexual selection . . . we observed female white bellbirds . . . within four meters or less . . . benefits females gain in assessing prospective mates . . . female bellbirds might actively balance an interest in assessing males at close range while trying to limit hearing damage . . . Presumably these risks are offset by benefits females gain in assessing prospective mates . . . white bellbirds well illustrate sexual selection’s power to drive evolution . . .”* [↑](#endnote-ref-3)