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Fish pain's burden of proof

Commentary II on [Key](#) on Fish Pain

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Abstract: A hypothesis like Key's, that fish cannot feel pain, should really be stated as a null hypothesis — an assumption that there is no difference in the things being compared. Then evidence — including anecdotal evidence — for and against rejecting the null hypothesis can be examined and weighed. Key (2016a) has proven only that fish lack mammalian brains.

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[Beyond Words: What Animals Think and Feel](#) is Carl's seventh book. <http://safinacenter.org/about-carl-safina/>

The hypothesis that fish feel pain and the hypothesis that fish do not feel pain are equal assertions. The burden of proof lies equally with their proponents to support their respective assertions. Neither assertion is really a good hypothesis. A hypothesis like this one should really be stated as a null hypothesis — which means an assumption that there is no difference in the things being compared — and then evidence for rejecting the null hypothesis can be examined and weighed. So I believe the real hypothesis underlying this debate would be: “There is no difference between fish and humans in pain perception.” Then data would be collected and analyzed, results would be presented and interpreted. Problems arise because few people state hypotheses in this way; most researchers instead try to “prove” their assertions (which is an obvious bias). A further problem is that in this particular case, pain perception cannot be measured between fish and people in the same way. Key (2016a) has proven only that fish lack mammalian brains.

Unfortunately for the quality of this debate, rather than actually exploring the question the researchers on both sides have to varying degrees argued like trial lawyers, as proponents for pre-formed conclusions. For his part, Key (2016a,b), who believes that fish experience nothing because they do not have a mammalian neocortex, does not even address most of the opposing arguments or evidence. For example, ravens can solve puzzles better than dogs (Jacobs & Osvath 2015), yet they lack a neocortex. Such facts utterly undermine Key's assertion; he ignores them. An actively feeding shark that has just voraciously eaten several chunks of fish bites a stinging jellyfish in apparent error and immediately shakes its head to eject the jellyfish. Jellyfish contain nutrients; why would the shark act as though feeling the pain of the stings?

Why, indeed, would jellyfish sting predatory fish if fish cannot experience pain? Indeed, jellyfish and stingrays were stinging fish millions of years before mammals existed. The observation is anecdotal but it is anecdotal evidence bearing directly on the question. Key does not address such evidence or arguments; he dismisses them with strings of labels: anecdotes, anthropomorphism, just-so stories.

It matters little what category labels can be pinned to these observations. What matters is whether those interpretations are valid, whether the insights are correct, the conclusion true. Surely it is better to consider an anecdote that may be instructive than to summarily dismiss it merely because it's an anecdote.

Like many laboratory scientists, especially those who study only humans, Key ignores evolution, the unifying principle of all biology. Evolution's main message and effect is the continuity of life. And evolution's corollary is that through the flourishing diversification of the living world come different solutions to the same problem, such as wings in insects, bats, and birds; and neural pathways in brains. Key might be a very good neurobiologist but he appears to be completely without traction or experience when it comes to what non-human animals do, much less what they might be experiencing, how, and why (Safina 2016). His collateral claim (Key 2015) that we humans dress for work in the morning "non-consciously" and drive our automobiles "like automatons" is — at least in my wholly anecdotal experience — simply bizarre.

References

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EDITORIAL NOTE: When invited to comment on Key's Response, [Marshall Devor](#) replied:

"Key's level of scholarship on the subject of pain, certainly in humans, is insufficient. I tried to correct the record with appropriate references in my commentary ([Devor 2016](#)). Key's response ([Key 2016b](#)), however, is an elementary-level attempt to educate the reader on pain pathways that is neither accurate nor responsive to the critical points I had made. Among other things, Key points out that pain is eliminated by lesioning the spinothalamic tract; as documentation, he provides one single-case report. There is an extensive, 50-year literature on the failure of this operation to provide durable pain relief that Key is unaware of, or chooses to ignore. Neither strategy is satisfactory, from a scientific and scholarly standpoint. Facts have to be confronted. The original target article ([Key 2016a](#)) showed a similar pattern: all too much unreferenced misrepresentation and misinformation. I don't think my commenting yet again in detail would serve much purpose."