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Peacock's Tail: Tale of Beauty and Intimidation

A peacock with its long colorful tail is one of the most prodigious visual attributes of our planet. It was famously featured on a cover of Amotz Zahavi's 1997 book, dedicated to the 'handicap principle'. According to this principle, the honest signal can only be a morphological or behavioural element which comes with a cost to the bearer. So in the case of sexual selection, for example, the power of charming the opposite sex is so great that it outweighs the problems of survival that are caused by this morphological or behavioural feature. The peacock's tail (known as 'train') is definitely the best known example of this principle.

So let us now discuss this topic in a bit more detail.

As we could see from the discussion above, any unusual exaggerated morphological feature (like brilliant colors, or unusual morphological forms, or sounds) can potentially be a sign not only to prospective mates to attract them, but a warning sign to predators and rivals as well. So if in one case it is a display of beauty and healthy genes, in other case it is a warning and intimidation through the size, colors and behaviour.

In this light, the peacock tail is not very different. It is huge, it is spectacular, and it can have both functions: it can definitely attract the viewers with even a faint aesthetical sense, and it can also scare away all the potential opponents with its extraordinary size and colors. The central question is: which function of the peacock tail is primary – attraction of females, or the intimidation and warning of rivals and predators?

I hope readers would agree that the easiest way to find out the answer to this question would be to study the lives of free-ranging peacocks for a long time in order to check out how the size and colors of peacock tail correlate with their popularity among females, and their reproductive success. If the attraction of females is truly a leading reason for the brilliance of the peacock's train, you would expect that males with a better tail would be more successful in leaving descendants. It is amazing that such study had not been conducted long time ago. Most likely scholars were so sure about the sexual nature of peacock's dazzling display that they did not consider necessary to test this tacitly agreed idea (or even a belief) with a sufficient long-term field study.

Only in the beginning of the 1990s, Marion Petrie, Tim Halliday and Carolyn Sanders published the results of their study on peacock mating behaviour. According to their results, as it was expected, females were choosing males with bigger trains with the biggest number of 'eyespots'. Unfortunately, the study was not large enough (researchers studied only one lek with 10 males for very limited time). In the second half of the 1990s, finally, a seven year long study was conducted in Japan.

During several mating seasons, from 1995 to 2001, the researchers in the Graduate School of Arts and Sciences at the University of Tokyo, under the leadership of Mariko Takahashi, studied a free-ranging population of Indian peafowl at Izu Cactus Park, Shizuoka, Japan. They expected to find confirmation of the power of sexual selection. Amazingly for the scholars, as well as for the supporters of the 'female choice' principle, they came to the conclusion that the female peahens were indifferent to the peacock tail size and brilliant colors, and that tail condition was not correlated with the reproductive success of their bearers either. Even the title of the publication in Discovery News expresses the amazement from the central conclusion of the study: 'Female Peacocks Not Impressed by Male Feather.' According to the article, 'The feather train on male peacocks is among the most striking and beautiful physical attributes in nature, but it fails to excite, much less interest, females, according to new research. The determination throws a wrench in the long-held belief that male peacock feather evolved in response to female mate choice. It could also indicate that certain other elaborate features in galliformes, a group that includes turkeys, chickens, grouse, quails and pheasants, as well as peacocks, are not necessarily linked to fitness and mating success.'

So what could be the reason of development of peacock's spectacular tail if females are indifferent to its beauty? Louise Barrett from the UK suggested, for example, that huge brilliantly colored train can be an obsolete signal, and its growth can be connected to other factors (like the absence of estrogen in the male), not to the attraction of females.

What about the idea of intimidation of competitors and enemies with the display of huge and colorful tail? If we take into account that to look bigger is one of natural selection's favorite strategies to scare away predators and competitors and avoid unnecessary physical confrontation, the idea that peacock's train was primarily designed by natural selection to scare away other male peacocks (and possibly predators), will seem very plausible. So I am suggesting that **the size and beauty of a peacock's train was created by the forces of natural selection to intimidate the opponents, not by the forces of sexual selection to excite and attract females**.

I am sure that my suggestion will cause a negative response from the scholarly community, as the peacock tail is a symbol of the famed 'female choice', but I hope that my opponents will be able to weigh all the pro's and against of my suggestion with a unbiased clear mind. I believe that our emotional commitment to see a peacock's tail only as a display of extraordinary beauty comes mostly from our irresistible drive to humanize animals and their feelings.

There are at least two more factors that also point to the possibility that the natural selection through intimidation, not the sexual selection through the female choice, was the force behind the brilliance of peacock's tail:

(1) There are many 'eyespots' on the peacock tail, and we know that eyespots are one of the favorite strategies to scare away predators and competitors in many animal species;

(2) Apart from a huge tail, peacocks also have a huge voice, and we know that loud voice is also a great evolutionary tool to scare away predators and competitors. By the way, according to the Japanese study, even for peahens

male vocalizations seems to be more effective in grabbing their attention than their colorful train.

Writing about the male desire to show off beauty, Darwin wrote: 'the males will sometimes display, when not in the presence of females, as occasionally occurs with grouse at their balz-places, and as may be noticed with the peacock; this latter bird, however, evidently wishes for a spectator of some kind, and, as I have often seen, will show off his finery before poultry, or even pigs' (Darwin, 2004:444). Unfortunately, we can not ask a male peacock what is the true aim of his display in such unusual situations, but it seems to me much more plausible that if a pig approaches a peacock, a peacock might be more concerned about defending its territory and personal safety from the pig rather than trying to show off its beauty before such an ungrateful spectator.

There is one more proof that Darwin did not even consider the possibility that exaggerated morphology and different behavioural displays of males could serve a function of safety through the intimidation of rivals and predators. Arguing for the importance of sexual selection, Darwin famously wrote: 'To suppose that the females do not appreciate the beauty of the males, is to admit that their splendid decorations, all their pomp and display, are useless; and this is incredible' (Darwin, 2004:557). Well, I totally agree with the great scholar that all the 'splendid decorations', and 'all their pomp and display' were definitely created by the forces of evolution to impress, but I am questioning Darwin's suggestion that the ***only*** possible recipient of this display was the opposite sex. Instead, I propose that the primary aim of the myriads of methods of display (visual, audio, behavioural) in animal world is to intimidate competitors, and ***through the intimidation to avoid unnecessary physical fight***. As I have discussed above, many animal species replace fights with much more acceptable and safe ritualized displays of their size and colors. I suggest peacocks are among such species.

After all, if there is good evidence that a female peacock (peahen) is actively using her much smaller tail to intimidate potential predators, then there is no reason to deny that the male peacock could do the same with his magnificent and much bigger train.

For us humans living in the 21st century, it is very easy to ignore the fears for physical existence that is the natural part of life of most other animal species. We often humanize animals, inadvertently impose our ideas and mental qualities on them, and in doing so we often fail to notice some of the basic concerns of their life. For example, unlike most animals in the nature, we certainly do not expect to be killed and eaten on any day of our life. Therefore, if we want to understand the motives behind the development of their behaviours and morphological features, we should be able to see their need for physical survival, and respect their practical perspective on many things. If we can free our thinking from the aesthetic-oriented human perspective, we will have a better chance to understand the most pragmatic, survival-driven animal behaviour and morphology.

This brings up a philosophical question: what is the real aim of beauty? Of course, to impress, but let us remember that the question of who we want to impress depends on the conditions and demands of our life. These demands are vastly

different for a human living in a contemporary city, for a bird in a jungle, or for a hominid who live a few million years ago on the African Savannah. When we feel safe we can appreciate the awesome beauty of such displays of power as a collision of meteorite with a planet, a tornado, volcanic eruption, or a lion attack. But if we do not feel safe, the awesome beauty turns into a sheer horror.

And of course, many would agree that the extraordinary beauty can be intimidating by itself!