

Penguin fight—understanding animal contest behaviour in five easy steps

November 9 2016, by Gareth Arnott



Credit: AI-generated image ([disclaimer](#))

Have you seen the captivating footage (below) of fighting penguins that went viral recently? Or perhaps you caught the epic battle between two Komodo dragons in the BBC's new Planet Earth II documentary. Wildlife documentaries often feature this kind of animal contest behaviour. The National Geographic Channel that captured the penguin

footage even produces a whole series [dedicated to animal fights](#).

But what's really going on in these melees? What are they about, how serious are they, and what makes a winner? Here are the key facts you need to know about animal contests.

1. Size really does matter

Big is best – when it comes to fighting at least. Take those two Komodo dragons fighting in Planet Earth II. It was no surprise that the larger one was victorious. Body size is one key determinant of fighting ability and there are plenty of other iconic examples demonstrating this in the animal kingdom.

In Northern elephant seals, the so-called "beach master" is typically the largest male who monopolises the breeding rights to a harem of females, engaging in sometimes ferocious fights [with any challengers](#). Similarly, during the autumn rut, male red deer stags fight intensely for access to harems of females, with the dominant male often [being the largest](#).

But across different species, the smaller underdog can prevail. This is because a range of other factors also influence fighting ability. Experience is important and there is a well-known [winner-loser effect](#) – an animal that wins a contest is more likely to win its next contest, while losing has the opposite effect.

Physiology [also matters](#). The penguin footage shows how exhausting fighting is, with both contestants taking a break after building up rapid breathing rates. Personality counts, too. Animals display consistent behavioural tendencies, with aggressiveness a well studied trait that varies between individuals of a species and [influences fighting ability](#). It can pay to get in first and intimidate an opponent into submission.

2. Judging the prize

Animals fight for access to [key resources](#) such as mates, territories and food. These resources impact survival and reproduction, and therefore the all important passing of genes to the next generation. Amazingly, animals can [adjust their fight effort](#) in line with how valuable they think the resource is.

In the penguin and Komodo dragon footage, it is no surprise that these contests became so escalated. The males are fighting for a vital resource in terms of a territory and access to a breeding female. It could be their only chance to pass on their genes to the next generation. The usurped male penguin is particularly interesting as he has already made a considerable prior investment with his cheating partner, and therefore will not give up lightly.

Some of the neatest examples of resource value influencing contest behaviour come from [hermit crabs](#). For these fascinating little creatures, their shell resource is vital, with individuals always on the lookout for a chance to improve on their current "home". They fight readily and in a very distinctive way for access to an opponent's shell.

In the footage above, the attacker on the right has been placed in a sub-optimal shell by researchers. You can see (and hear) it engaging in bouts of "shell rapping" with its defending opponent, who has been placed in an ideal shell for the attacker's size. In this case, the fight ends dramatically with the eviction of the defender.

3. Possession matters

Possession is nine-tenths of the law – or so the saying goes. This also applies to animal contests, with resource "owners" being more likely to

win in contests against "intruders". There are numerous examples of this across the natural world, including territory ownership in birds, fish and butterflies.

In this regard, the penguin fight demonstrates another interesting phenomenon of a so-called owner-owner fight. Both males perceive that they have ownership of the burrow and associated female, with each unwilling to give way, resulting in a highly escalated fight.

4. Better to survive to fight another day

Fighting is costly in terms of injury risk and death. So, contrary to the film examples, most contests are resolved [without resorting to life-threatening fighting](#). This includes the use of elaborate ritualised displays, with classic examples including the roaring contests and [parallel walk displays of deer](#), the gill flaring, tail-beating and [mouth-wrestling of fish](#), and the drumming and [leg waving displays of spiders](#).



Credit: AI-generated image ([disclaimer](#))

5. Sizing each other up?

A documentary narrator will typically use this phrase when describing an animal contest, with the assumption being that the weaker opponent will quit when it assesses its inferiority. Humans are very good at assessing competitive ability but is this equally true for all contesting animals?

We typically assume that the kind of ritualised displays mentioned above allow animals to assess their opponents. But sometimes they don't have the ability or chance to judge their opponent and so go through a self-assessment process, weighing up their own abilities rather than being distracted by their opponents.

[Research suggests](#) this self-assessment happens often. In the penguin example, each individual attacks at their maximum rate regardless of the opponent. So the next time a nature documentary tells you animals are sizing each other up, remember they may well be thinking about their own vital statistics, not their opponent's.

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