

The sound of one hand clapping

Combat in the animal kingdom is pervasive. Animals fight to gain mates, food and suitable places to rest and they fight to protect what they have, be it food or young. But with fighting there is risk, the risk of injury and death. To offset such risks, many animals use a variety of signals to feign, bluff or otherwise convince competitors to give up the fight before it starts. But, therein lies a problem for observers: an obvious, exaggerated action may look like such a signal to us, but is it really a signal? During fighting, animals often target some particular part of its opponent's body for attack. This can be bitten or otherwise struck, and to do so the attacking animal will maneuver appropriately to access its target. Conversely, the potential recipient of the attack does not just stand there and take it, but will maneuver to block access to the body area being targeted, and if successful in this, may even deliver a retaliatory strike. In this way, any action by one animal is embedded into the dynamics created by the countermoves of the other animal. Simply focusing on obvious movements and abstracting them from the dynamic exchange and labeling them 'signals' can misconstrue the reason why that action takes place. Its function as a signal may be emphasized when, in fact, the action functions as a combat maneuver. An example is in order.

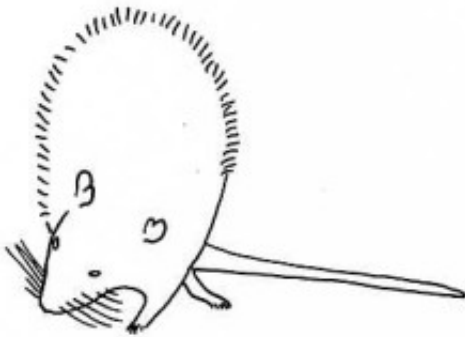


Fig. 1. Imagine the intruder to the left side of the page, in which case, the resident can be seen laterally oriented, arched and with its fur standing up.

Among male rats, residents of a territory will attack and expel an intruder. A resident will often approach an intruder while adopting an arched posture with a lateral orientation, and with their fur raised (Fig. 1). This posture is so obvious and striking that it has been called a threat signal or display. But is it a signal? The resident attacks and delivers bites to the intruder's rump, which the intruder maneuvers to defend, often by standing upright, facing the attacker and pivoting to keep its rump oriented away from the attacker. In addition, the defender may retaliate against the resident by lunging and biting the side of the resident's face. Thus, the problem for the resident is to access the intruder's rump while avoiding being bitten on its face. By approaching in the lateral orientation, the resident moves in closer to the intruder until its flank is pressing against the intruder's belly, but in so doing, it keeps its face out of reach. Continuing to press against the

exposed belly of the intruder can lead to the intruder to lose its footing, at which time the resident can then swing around and bite an exposed lower flank. Indeed, the arched posture increases the speed of the attacker's swerving movement because its head and hind feet are closer together. Therefore, when viewed within the dynamic context of the combat actions of both animals, the lateral approach is a combat maneuver, not a signal. Both the orientation towards the defender and the arching of the body serve as components of the action that facilitate attack. Only the raising of the fur is not functionally relevant for the combat, and may be present as a way of signaling the intended attack to the opponent.

Why is this important? Because understanding why animals perform particular movements in particular situations is a necessary first step in understanding how the brain produces behavior and how that behavior can evolve. Clapping, after all, is produced by the dynamic interaction of two hands, paying attention to only one hand would miss the point.

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Publication

[Are agonistic behavior patterns signals or combat tactics - or does it matter? Targets as organizing principles of fighting.](#)

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