

(*Editor's note: Following is the author's rebuttal of responses made by Lynn L. Rogers and Susan A. Mansfield (2011), and Stephen Stringham (2011) to his commentary, "Wildlife habituation: advances in understanding and management application", which appeared in Human–Wildlife Interactions 5:9–12.*)

Response to Rogers and Mansfield (2011) and Stringham (2011)

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THREE VALUED COLLEAGUES, extremely knowledgeable of bear behavior, have taken exception to some of my writing. I am grateful to be able to reply. There are a number of points of contention. Regarding habituation, I am well aware of the definitions proposed, but I find them wanting. How does "a waning of responses to a repeated, neutral stimulus" differentiate adequately between habituation and taming? Put another way: how could one disprove the claim of Rogers and others that they are working not with habituated, but with tame bears? Bears do tame, after all, quite easily. But if they tame, then how does that differ from habituation?

I experienced working not only with habituated, and also with thoroughly tamed, but free-ranging mountain sheep (*Ovis canadensis*). Further, the animal may continue exploring the observer not only when habituated, but also when tame. Therefore, even tameness may be a state of unconsummated exploration. I have observed free-roaming sheep in 4 stages of acquaintance: (1) those that I saw at a distance with spotting scope and binoculars; (2) those that I habituated to my presence till they ignored me and went about their daily lives (very much as Rogers and Mansfield described it for their work with black bears [*Ursus americanus*]); (3) those that I tamed systematically; and (4) those that proceeded to address me as a conspecific. It may be worth examining this 4-stage progression, as it was unexpected.

First, the changeover from habituation to taming was initiated always by the habituated sheep. It began when the sheep, after observing me noticeably, approached me and began to explore me physically. They sniffed my clothing, touched it with their muzzle and licked at it. I allowed this to happen and that

then let them touch and lick a piece of rock salt I held in hand. This they licked eagerly, at which time I placed my fingers on their nose and then proceeded to systematically touch and stroke their faces till they allowed me to clear hair off the small aluminum ear-tags that park wardens had placed there earlier, usually when the sheep were lambs. They tagged adult sheep by slipping the ear-tag over the lower ear and clamping down, releasing the pliers at once as the sheep bounded back, shook its head and came back and resumed licking the salt. I tagged lambs by hunching beside a female while it licked salt. As the lamb approached, I touched it on the breast until it accepted the human hand, then it was gently lifted up right beside the female's head. No lamb protested. Tags were clamped into the ears, and the lamb was slowly and gently released, the female licking salt all the while. Thus, no drugs, traps, or wrestling to the ground of panic-stricken animals was necessary. I could freely walk up to the tame sheep and touch them. That is why I know, for instance, that bighorns are ticklish. The tame sheep, otherwise, went about their daily business much as they had when merely habituated.

This continued for nearly 2 years, but, then, sheep began a new phase of interaction: they started including me into their social system, with the females treating me as a super-female, and the rams as a rival. This last phase began with females and lambs associating with me, using me as a center of their activity. This was followed by them taking notice of my departures from the herd in the evening, followed by an old female running to me then blocking my further progress by body contact, very much like a lamb blocking a female before suckling. I could play hide-and-seek with the

sheep and discover that they did not simply follow where I disappeared, but, they had a conception of where I should reappear and they awaited me there. They were spatial strategists. However, they would also track me—their nose to the ground—for hundreds of yards till they found my hiding place. Further, bands of females followed me into the valley. Soon after leaving the open hills, they clustered behind me and assumed body contact. They could be led anywhere, but they broke into a run when I returned them to within 100 m or so of their home range.

Then the first ram addressed me suddenly with its head high horn display, one of 2 horn displays, dominance or status displays. This was a serious challenge. However, in mountain sheep, it can be easily terminated by stepping up to the ram and sharply shoving him downhill so that he stumbles. Stumbling is essential. In dominance fights, the ram who stumbles after a clash is the looser. He gives up by turning, feeding, and accepting the full-fledged, ongoing courtship procedure of the dominant, mounting included. A subordinate does not leave the band after losing status, but remains being treated as a female by the dominants.

I was attacked once when I was surrounded by a large, rutting band of sheep on a steep slope. I tried to disengage by suddenly turning and running down hill and was at once struck by a large ram. My second escape attempt resulted in another attack. I escaped injury as the clash is a twisting downward blow in which the horn edge acts much as a hand in a karate blow. The horns brushed down my back and the ram slammed his head into the scree. I gave him a piece of salt that he could not readily spit out, and as other sheep crowded in to partake of the salt, I escaped. However, that ram came for me subsequently every morning from as far as nearly half a mile away. He would rear running on his hind legs showing readiness to clash. I would then step behind a female, allowed the ram to run past and then rear towards me on the downhill side. Now, however, I was taller than he, and I simply stared at him (rams cannot clash uphill). He would blink, eventually, drop to all fours, give me the head-high display—I would not budge—then turn and start grazing (peace signal), at which point I stepped forward and gave him a little swat on his bum. He would

hop forward and at once continue grazing. After that he was just fine all day long. Come morning, the whole procedure was repeated. This ram surprised and knocked one of my colleagues unconscious. Fortunately, the ram soon disappeared, never to be seen again.

Subsequently, I took pains to insure that none of the animals I observed would be anything but habituated. There is no way to handle the attack of any male deer, elk, moose, bison, etc. I, thus, do not counsel working with free-ranging, tame, large mammals. As an aside, I have no doubt that the proclivity for taming by bighorn sheep was known to native people, and this allowed them to manage the sheep. Petroglyphs in the canyons of Utah and elsewhere attest to this.

Different species end habituation differently. In my experience, exploration by sheep and whiskey-jacks (i.e., Canada jays [*Perisoreus canadensis*]) was gustatory (how did I taste?). In free-ranging wolves (*Canis lupus*) and coyotes (*Canis latrans*), habituation may change to an exploration of an alternative food source, resulting in an attack. This was originally discovered in coyotes targeting children in urban parks by Baker and Timm (1998), and independently discovered for wolves by myself (See Appendix B in Geist 2007). Woolpy and Ginsburg (1967) found that wolves also did their final exploration as an attack. In short, my account of habituation is based on contrast with taming and its consequences.

Rogers and Mansfield (2011), and Stringham (2011) reported that in their professional experience habituated bears are harmless. Unfortunately, bears are not always treated with caution and skill as done by professional observers and viewing guides. Bears in the Canadian national parks where I worked were routinely molested, especially through photography, and had a very high rate of mortality (Nielsen et al. 2004). For example, a young female grizzly bear (*Ursus arctos*) showed up in my study area in the back country of Banff National Park. She did not flee from my vehicle as other grizzlies did (habituated?). A district warden and I were fishing at a beaver pond when we were charged by this female. She appeared suddenly across a narrows and charged instantly, jumping into the water and swimming for us. I escaped by climbing, the

warden by diving. Shortly thereafter, she treed this same warden and a horse wrangler. When she appeared a third time, the warden was carrying a rifle. A student of mine also was treed when he surprised a large male grizzly on an elk kill. Years later he and a warden were deep inside the wilderness of a newly-minted national park out in the wide open when they were met by a an old female grizzly with a 2-year old cub. After “dancing about” apparently examining the intruders, the female and cub charged. My former student shot both bears, one of which was on top of the warden. One bear attack by a (habituated) black bear resulted in a kill-order to remove all habituated black bears; 256 bears subsequently were killed. The wardens who did the executions secretly informed me of this while we worked in the parks. Subsequently, colleagues in parks have worked hard, and successfully, to reduce the carnage.

Do bears terminate habituation with attacks? I suspect that, unless they are professionally handled, they occasionally do. And that is where the lesson resides, thanks to the dedicated professional efforts and successes of the likes of Lynn Rogers, Susan Mansfield, and Stephen Stringham. I counsel caution with animals that do not flee, that look “habituated”, unless one knows their history.

Another bone of contention between my colleagues and myself was signaling by bears. Dominance or status displays are signals universal to vertebrates, and bears are no exception. Displays of status cannot be understood in isolation from the subject of aggression (Geist 1978a). Status displays vary considerably. In mammals, they tend to be body displays in their primitive form, but may be weapon displays in other species. An individual thus signals its superiority and may back it up with an attack. In humans, dominance displays reach the highest diversity of expression through the cultural elaboration of the biological basis. We use art to enhance innate display structures that we share with old world primates (face, head-hair, chest, penis, butt) followed by sophisticated cultural elaborations. Our displays express pride, humor, and also the antithesis of dominance—courtesy—and incorporate, among others Thorstein Veblen’s “conspicuous consumption”. There are at least

10 rules we follow in showing off our status. (Geist 1978b).

Because dominance displays are species-specific and quite different from species to species, its study in ungulates has the advantage of many species to compare. Moreover, the large size of the animals and visual orientation have fostered picture planes during the display that closely follow artistic theory. Show and explain such to students of art, architecture, or design, and they instantly recognize the code and follow matters with enthusiasm, while biologists sit there with glum faces! (It, of course, suggests that large mammals use much the same neural mechanisms to evaluate and interpret space). The trouble is that unlike primates, ungulates notoriously avert eyes from the individual displayed to, so that we may not even notice that we are being signaled. A friend working in a zoo barely escaped with his life, though not without injury, when he was attacked by a rutting, white-tailed deer (*Odocoileus virginianus*) buck that apparently ignored him. Some captive stags approaching with their eyes averted respond with an instant attack into the fence if one looks away from them. Looking away made a victim of a good acquaintance of mine (also a zoo worker) who, while close to the wire fence, looked away from an approaching bull elk (*Cervus canadensis*) that appeared to ignore him. The elk’s fourth tine penetrated my friend’s chest just above his heart. Fortunately, he was saved. My late friend Fritz Walther, himself a former zoo director, and a great student of ungulate communication, talked of a number of similar happenings, some with tragic outcomes because the eye-aversion threw off the human victim. Unfortunately, I can go on with such war stories. Standing with friends, students, and colleagues in front of zoo exhibits or showing them films, I found again and again that they overlooked the displays of ungulates, but quickly caught on once it was explained. As primates, we understand primates better. They look at us!

In 1963, I showed to graduate students at the University of British Columbia my first film, featuring mountain goats, including the long, stiff dominance displays of big rutting males. Maurice Hornocker spoke up, pointing out that grizzly bears had a very similar display. Hornocker had done a masters thesis

on grizzly bears. He was, of course correct, as the dominance display of bears was later described in detail by Stringham (2010) and labeled “sumo display”. It is so similar to that of primitive ungulates (broadside orientation, aversion of eyes, stiff motion, release of urine) that one might be forgiven looking for horn-on-the-head of the displaying bears. As expected, this is primarily a display of large males to one another. Dominance displays signal intent to dominate. They are not “harmless bluster” as has been claimed.

Stringham (personal communication) related to me that in all the years of his work with black and grizzly bears he has never been addressed with a “sumo display”. This speaks legions about the tactful, careful approach in observing bears used by this exceptionally capable scholar. I have been, however, addressed with the “sumo display” by very large black bear males for perfectly logical reasons. For the past 16 years, I have resided with black bears (and misbehaving wolves) in an agricultural district on Vancouver Island. Two salmon streams pass through our acreage close to our house, where we also have poultry, fruit trees, and grape arbors. These are great attractants for bears, and I set myself the task of keeping bears out, as shy bears avoiding humans are the only live bears hereabouts. A dog announces the arrival of a bear, and at any hour of the day or night I respond, clattering the action of a pump shotgun (super-teeth-clapping) moving at the bear till it flees. Young bears and most old male bears fled at once and usually stayed away (although snowfalls revealed that they were constantly monitoring me). However, 2 large males “objected” in their species-specific ways and pushed back, which included sumo displays! I have seen these displays performed by large males in their interactions. Bears learned quickly to avoid the vicinity of our house, but continued making use of the salmon streams and meadows close by. From our veranda, we can hear them fishing.

The study of animal behavior is not a monolithic discipline, but it contains different lineages that evolved their own language and conceptions. Konrad Lorenz introduced the notion of expressions as resultants of different, conflicting emotions, and bear biologists still hang onto that. Others, in particular ungulate

ethologists, pointed out that such a scheme falls to pieces the moment one does an interspecific comparison of dominance displays, as even closely related species may have greatly different status displays. Secondly, emotions are inferences, not observations as illustrated by the sentence “The ant stamps its feet in anger”. We preferred to stick to observable phenomena, avoiding deliberately terms like anxiety, fear, or nervous apprehension. Note the difference: Rogers and Mansfield describe beautifully the threat behavior of black bears. They then add that from their experience, there is no follow up with attacks, and even the threats diminish with time spent with bears—very important observations. However, the phenomenon involved is still a threat as recognized by the universals of threat behavior, namely the orientation toward an opponent, intimating the use of weapons (mouth and paws), even if the chances of attack are low. I concur that threats are mostly a defensive behavior. However, one does not ignore them, even if there is low danger, and I do not think that Rogers and Mansfield counsel such.

Ignoring threat signals (i.e., defensive ones) can be costly. For instance, one threat behavior of moose (*Alces americanus*) is to lift a hind leg slightly off the ground, cocking it, ready to strike. A warden in Yellowstone National Park, faced by a young bull blocking the plowed snow road to snowmobilers, though the moose was injured. He tried to haze the bull into the deep snow. In vain. (When confronted by predators, moose seek out small areas of low snow and hard footing, on which they can spin around unimpeded striking with their front legs and lashing out with their hind legs. The power is great and the aim very accurate). He managed to make the bull move to an edge, using bangers, upon which he signaled the snowmobiles to proceed. The moose attacked the first snowmobile instantly, leaving 1 man with a broken neck. The court case against the park was dismissed on the basis of sovereign immunity.

I am grateful to Lynn Rogers for elaborating on the Timothy Treadwell case. I was aware of Treadwell’s “samurai” mode. I also practice it very frequently and have done so for 16 years, with the aim of teaching black bears where they will be confronted and where not, where they

can feed in peace (salmon stream, grazing or mousing in meadows) and where not (garden, chicken coops, apple trees close to house etc.). For years, very few large males did not accept being displaced without protest! I am well aware that bears (and wolves) are, paradoxically, timid compared to ungulates and that assertive behavior on our part is good protection from harm. Large mammals that readily draw blood are, as a rule of thumb, unlikely to enter into overt combat. Retaliation by the victim sees to that (Geist 1966, 1978a). I think bears fall into this category, especially black bears who are products of the competitive large predator fauna in Pleistocene North America. I saw Treadwell's behavior on film, and was appalled. I am impressed that he lasted as long as he did.

The great achievement of Rogers, Mansfield, Stringham, and bear-viewing guides is to demonstrate how knowledgeable habituation can result in safe bear viewing. This knowledge needs to be spread (see Stringham 2002, 2007, 2009, 2010). In national parks, I have seen a lot of misbehavior towards wildlife by tourists, as well as by park staff, which is not likely to cease, nor are the dangers arising from this behavior. A good understanding of the body language of large mammals, bears included, not only makes viewing more interesting, but can save the lives of humans and wildlife. I do not think we disagree on this point. As for the rest—I pass.

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