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"Everyday" Knowledge and a New Paradigm of Animal Research

Commentary on Marino and Allen (2017) The Psychology of Cows

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> *You'll watch say ten cows come down to that [water] bowl. The boss cow gets to drink first. Of that ten, there'll be two that'll say, 'Ah, the hell with this', and they'll go down into the mud. Eight will say, 'We'll stand back and we'll wait — we'll wait here'. So, they're just like people. It's just fascinating for me to watch the comfort level of who they like to be with.*

These were the words of a cattle rancher from western Canada recorded during interviews that tried to capture farmers' and ranchers' views about animal welfare (Spooner, Schuppli, & Fraser, 2012). The quote indicates a little of the rancher's understanding of cattle: that they are individuals with very different personalities, that they have relationships with each other – sometimes hierarchical – based on individual recognition, and that they form specific affiliations with other members of the herd.

This kind of "everyday understanding" is possessed by a great many farmers and ranchers whose work revolves around animals. It is based on what scientists might term "narrative data" (Fraser, 2009): descriptive observations of how specific individuals interact with other specific individuals, how they deal with the environment in their individual ways, how they respond to different human beings, and how all this changes (or remains consistent) in different individuals over time with maturation and learning. This type of information gives farmers and ranchers an understanding of cattle that is similar in many respects to the understanding that observant dog-owners have of their dogs, or that attentive zoo keepers develop of the animals in their charge.

Some scientists develop a similar understanding of animals through research. As one example, Goodall's (1971) narrative accounts of the lives of chimpanzees led her to recognize emotions and cognitions in the animals, and a similar approach has been used on other species (e.g., Moss, 1988; Smuts, 1999). However, the everyday understanding of animals possessed by farmers and ranchers is quite different from the scientific understanding that comes from much of the formal research on animal behavior, partly because of the dominant research paradigm that behavioral scientists have traditionally used: studying animals under experimental conditions rather than observing their normal lives; treating animals as exemplars of a species, not as unique individuals; and relying on quantitative data while

tending to dismiss narrative data as mere "anecdote" (Fraser, 2009; Mitchell, Thompson, & Miles, 1997; Rollin, 2000). In many cases this paradigm creates little need to understand the cognitive and emotional lives of animals, and it may cramp our ability to do so. Suppose, for example, that scientists test the predictions of Parent-Offspring Conflict theory by quantifying the average time that parents spend near their young as correlated with brood size and offspring age. The resulting information can be expressed in a graph or mathematical formula, and little would appear to be gained by trying to understand whether the parents "love" their young and the young "expect" food from the parents. Of course some scientists have seen a role for emotion and cognition throughout the history of behavioral research. Examples include Harry Harlow's references to love in monkeys (Blum, 2002) and the motivational theory of Young (1959) that revolved around positive and negative affect. But the dominant paradigms of both behaviorism (Watson, 1924) and ethology (Tinbergen, 1963) explicitly denied the use of experiential states as playing a role in science.

However, narrative data stimulate us to think differently. Suppose (expanding an idea of Baenninger, 1990) that a dog in an apartment responds to the sound of one set of approaching footsteps in the morning with growls, loud barks, stiff tail and forward ears, but to a different set of footsteps late in the day with tail-wagging, perked ears and a mixture of yelps and whimpers. How can we possibly create a convincing and parsimonious explanation of this complex behavior without postulating emotion and cognition in the animal?

The postulated emotions and cognitions may, of course, be incorrect. Like any hypothesis, the ideas need to be tested if they are to be adopted as scientific knowledge, and this can be done. For example, if piglets become separated from their mother and litter-mates, they begin to walk more and more rapidly, they defecate repeatedly, and they give calls that steadily increase in rate, loudness and pitch. The everyday understanding of this behavior is that piglets experience separation distress when they cannot find their mother. To evaluate this hypothesis, we can generate and then test predictions that arise from it by seeing whether the different responses co-vary, seeing whether they are mitigated by the presence of the mother or other familiar animals, and so on (Fraser, 1975).

As Marino and Allen (2017) have ably summarized, scientific knowledge of the emotions and cognitions of cattle has become considerably richer in recent years, and has started to resemble the kind of everyday knowledge expressed by the rancher above. But this puts science in an unusual position. Scientists are accustomed to being knowledge providers who produce new information that is then accepted and used by others. For example, when ranchers were confronted with White Muscle Disease in calves, scientists showed that it was due to a selenium deficiency and could be remedied by a nutrient supplement (Jenkins et al., 1974), and ranchers then acted on this information. But if scientists tell farmers and ranchers that modern research demonstrates that cows can tell each other apart, that they have individual personalities, that mother cows become distressed if their calves are taken away, and that cattle remember which people have handled them roughly or gently, then farmers and ranchers – to whom such things have been clear for centuries or millennia – may be moved to ponder the mental capacity of the scientists, not of the cows. Of course, such research has merit within the value system of science because it tests and confirms everyday knowledge so that it can be accepted as scientific knowledge, and in time the research may result in new understanding. For example, as Marino and Allen noted, individual housing of dairy calves – a common farm practice – results in learning deficits. But much of the research summarized by Marino and Allen falls well short of extending the existing knowledge that already guides the actions of farmers and ranchers.

Moreover, farmers and ranchers are not blind to the moral implications of their understanding of cattle as emotionally and cognitively complex beings. As one rancher expressed it (Spooner, Schuppli, & Fraser, 2012):

> *We've hired some people that had no livestock experience whatsoever…. And once they start understanding cattle, they seem to have – you know – more respect for them, watching behavior and understanding what some of these things that they're doing means.*

Recognizing cattle as complex beings creates moral conflict, and farmers and ranchers have responded to this conflict in a wide variety of ways (e.g., Wilkie, 2005). Some become so conscientious about animal care that they cannot sleep a full night in calving season for fear that an animal might suffer (Spooner et al., 2012). Others make a point of not developing close attachments to animals (Bock, Van Huik, Prutzer, Kling Eveillard, & Dockes, 2007), perhaps much as medical doctors develop a professional distance from patients. Many learn to manage the conflict when they are still children, forming close attachments to calves that they raise and yet learning to accept that the animals will be used for a practical purpose at a certain point (Ellis & Irvine, 2010). Some find it painful to part with animals, especially when an injured animal needs to be dispatched prematurely, giving a sense of both failure and emotional loss (Koralesky, 2017).

Taken together with Marino and Allen's review of the relevant science, what insights can we draw from this perspective on the everyday understanding of cattle possessed by experienced farmers and ranchers?

First, we suggest that scientists need to take qualitative, narrative data seriously. The traditional scientific paradigm, with its reliance on quantitative data and controlled experiments, has great power to test hypotheses but, in the case of animal cognition and emotion, has arguably stunted the generation of hypotheses (Fraser, 2009). Incorporating narrative data into science in thoughtful ways could lead to a more productive scientific paradigm, in part by suggesting new hypotheses that could then be tested through the more traditional tools of science.

Second, scientists might build explicitly on the knowledge possessed by people who work closely with the species. Experienced farmers and ranchers are species-specialists, often with decades of personal experience interacting closely with animals. Rather than stereotype them as people who treat animals as mere commodities, scientists might approach them more in the way that cultural anthropologists approach the people whose cultures they study: as the obvious first line of enquiry, and as people whose knowledge and beliefs deserve to be probed and understood.

Third, perhaps the scientific community could benefit from understanding how farmers and ranchers approach the moral conflict that accompanies working with emotionally and cognitively complex beings. Collectively, scientists have evolved a fairly standard, formalized approach to animal ethics that hinges on bureaucratic procedures and committee meetings (Schuppli & Fraser, 2007). As everyday knowledge of animals becomes more accepted into scientific knowledge, perhaps the scientific community will develop the appreciation of animals as complex, sentient beings that many farmers and ranchers show. In that case, perhaps we will see a wide diversity of responses to the resulting moral conflict and ultimately a more robust questioning of the actions and decisions made in the conduct of science.

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