Animal Welfare Science, Performance Metrics, and Proxy Failure: A Commentary on John et al.

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Abstract:

In their target article, John et al. (2023) make a convincing case that there is a unified phenomenon behind the common finding that measures become worse targets over time. Here, we will apply their framework to the domain of animal welfare science and present a pragmatic solution to reduce its impact that might also be applicable in other domains.

Main Text:

There is a widespread finding in different domains in which the emphasis on measures can detract from the primary objectives these measures were initially designed to achieve. John et al. (2023) have examined the shared characteristics of these findings and argue that there is a unified phenomenon here that they term "proxy failure." They argue that whenever a regulator pursues a goal that involves incentivizing other agents based on their performance of a proxy measure, an inherent incentive or force emerges that causes the measure to diverge from its intended goal (p. 45). Here, we will apply their framework to the domain of animal welfare science and present a pragmatic solution to reduce its impact; insights that might also be applicable in other domains.

Animal welfare science is a relatively new discipline, having come into existence through the late 1970s and early 1980s and there was a strong pressure to be seen as a serious scientific discipline. With the behaviourist tradition still strong, talk of mental states of animals was often seen as unscientific. In order to gain more respect as a serious subject of research, animal welfare science aligned itself primarily with veterinary science, and physiology more generally. This meant that the welfare indicators chosen were those physiological indicators that were easy to measure 'objectively' (Browning 2022b; Browning & Veit 2023). Given the difficulties in selecting and validating indicators, and the strong social and economic incentives at play within the science, ethics, and policy of animal welfare, this provides a perfect setting for the type of process of proxy failure described by John et al.

Indeed, there has been a focus on indicators that measured stress, such as changes in heart rate, and levels of glucocorticoids in the blood, faeces, or other tissue. Stress markers were seen as valid

indicators of animal welfare through the lens of the dominant definitions of welfare at the time, which focused on how well an animal was 'coping' with its situation (Broom 1986). Stress is a measurable bodily state that can be discussed without reference to the 'unscientific' mental experiences of animals and thus was seen as a suitable way of measuring welfare. We content that early entrenchment of these stress-based welfare proxies, and ongoing social and economic incentives for their use, has led to precisely the problem John et al. describe (i.e. incentives to select for reductions in stress have led to the measures becoming worse proxies for the target state of welfare), though one that we think there are some practical means of offsetting.

Using their framework, proxy failure can be seen as an outcome of a system in which *regulator* with a *goal* uses a *proxy* to *incentivize* or select *agents* in service of this goal. The regulator provides feedback (e.g. rewards/punishment) to the agents, adjusted based on performance as perceived through the proxy and incentivizes the agents (either actively or passively) to increase production of the proxy itself rather than the goal. In the animal welfare example we've described, the goal is broadly to improve the lives of animals. The proxies are the stress markers we have discussed. The regulatory system can be seen as the general set of social, institutional, and economic systems that impact on treatment of animals by industry. While there are specific regulators at play in different parts of the animal industry, we think that the best view is the broader systemic one, as there is no single regulator that is solely responsible for the proxy failure effect. The agents are then the animal welfare scientists, industry professionals, and policy makers, who respond to calls for improved animal welfare. The incentives are the social and economic conditions that reward or punish agents within the animal industry, including ethical concern, consumer decision-making, and social licence to operate. As this feedback is provided primarily on the basis of stress-based measures, a reduction of stress (or, in the indicators used to mark it) becomes more important than a broader consideration of what is or is not good for welfare. This can be seen in the myriad studies that look at effects of changes in conditions on the glucocorticoid levels of animals, and make recommendations on this basis, without a deeper discussion of what these levels actually represent.

As the authors note, most proxies are merely approximation of their goals, and the more complex the system, the more imperfect the approximation is likely to be. Although there is no strong consensus on the best way to define welfare, there is widespread agreement that it is a highly complex state made up of multiple interacting components. The view of welfare as consisting in subjectively experienced mental states is becoming increasingly dominant (Browning 2022a; 2023). Although stress is closely linked to welfare, and comprises part of welfare, it is not itself a complete representation of welfare. Over the past decade, there has been an increasing focus on positive welfare – the capacity of animals to experience positive experiences, rather than just the absence of negative states such as pain (Yeates & Main 2008). An excessive focus on stress measures is partly why positive welfare was overlooked for so long.

To deal with this problem, animal welfare scientists have relied upon additional proxies that are better able to capture the aspects of welfare that stress-based proxies overlook could serve as appropriate constraints (Browning 2020; Veit & Browning 2020). While the addition of new or additional proxies is identified by the authors as part of the 'proxy treadmill', we think that this is not necessarily a problem, as it is unlikely to be an ongoing cycle of never-ending modification. Rather, careful selection of a few proxies that represent different aspects of welfare could lead to stabilization through their

combined direct causal link to the target state. Similarly, we are confident that other fields will be able to partially overcome proxy failure by relying on a variety of different measures without becoming too attached to any single one.

Conflict of interest statement:

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