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'The case against the use of the air-cushioned whip in horseracing: analyzing the arguments'

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ABSTRACT

Due to the growing emphasis on the importance of the rights and entitlements of non-human animals, horseracing has come in for renewed and, in many instances, justifiable scrutiny. This has led to an ongoing public debate concerning the use of the padded whip in particular – a debate which has been reasonably open and well contested. However, the scientific/academic debate has been disappointingly one-sided and, to date, the views of anyone other than those opposed to the continued use of the padded whip have not been given an airing. This paper seeks to redress the imbalance in the academic debate by revisiting some of the key arguments deployed by authors who express grave concerns over the use of the padded whip in racing, challenging what are taken to be significant weaknesses in many of them. For the sport to be able to make informed policy decisions on this important issue, a number of things are needed. First, a critical review of the studies available is needed. And, secondly, gaps in the literature and research need to be flagged. As things stand, the jury is still out from a scientific and philosophical point of view on the issue of whether the padded whip is painful, despite the claims of some of the more vocal critics of the practice. This paper will further look to identify the challenges ahead and the kind of research urgently needed.

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The pressure brought to bear from an increasingly informed public and concerned activists, along with the constantly evolving understanding of horse welfare within racing, has led to numerous reforms and rule changes, and there is an increased emphasis on the importance of horse welfare within the industry. The same pressure, both internal and external to the sport, led to a complete overhaul of the design of the traditional whip in the mid 1990s, and jockeys in many racing jurisdictions are required to use a standard, air-cushioned or padded whip today.¹ This has failed to alleviate the concerns of many prominent activists and critics of the practice who advocate for the removal of the air-cushioned whip either for encouragement or (in some instances) tout court owing to what they judge to be the noxious nature of the whip as a stimulus.

Those with a particular interest in the rights and entitlements of non-human animals could theoretically object to the discussion in what follows from the outset insisting that the longstanding debate concerning the use of the padded whip in horse racing is superfluous since horse racing, on ethical grounds, should not be permitted in the first place. That is not an objection that we will address here, and, for the purposes of this paper, we don't need to address it since organisations such as Animal Aid, RSPCA (Australian), PETA and (more importantly for the purposes of this paper) the majority of the relevant scientists and academics are more than willing to focus (in the relevant debates) exclusively on the use of the padded whip in racing – arguing that it should be banned on

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welfare grounds. However, this means that they open the door for the arguments presented in what follows in that they are allowing for the range of intuitions that determine current attitudes concerning the treatment of animals in our society and thus have already (tacitly or otherwise) accepted a simple fact: we live in a society that does not think it unreasonable or immoral to keep pets, to kill animals for food, or to use their hides for leather goods and products.² That is not to deny that there are significant numbers of people who campaign against various practices on the grounds that animals are entitled to not be disposed of in the ways that they are. Notwithstanding, they remain in the minority and thus the debates that are conducted concerning factory farming, acceptable codes of practice, and the humane treatment of animals and pets, take place within a context where the argument against speciesism, for example, is not really deemed directly relevant. In other words, many of the discussions concerning the humane treatment of animals that will be killed for food, or domestic pets, or racehorses would be unnecessary if one began from the presupposition that we should treat animals as beings with many of the same rights and entitlements as human moral agents.

A presupposition shared by many of the authors examined here that *will* be challenged is that horse racing is cruel in ways that other human–animal interactions are not.³ This is at the very least a question-worthy conviction given that it is made from within the cultural and political contexts of societies where meat eating, dog shows, the use and manufacture of leather goods, the training of pets, and so on, are all widely condoned. Just to be clear then, in terms of the current debate concerning the use of the padded whip, the arguments that we examine, criticise and indeed offer, are situated in the context of public debates where the moral status of non-human animals is *not* taken to be on a par with those of human beings.⁴

An overview of the debate

Despite its currency and the contentious nature of the topic, there is a disappointing paucity of scientific research concerning the *physical* effects of the contemporary, padded whip on racehorses. A significant amount of what is presented as evidence and argument, even in formal scientific discussions, tends to be speculative and/or indirect.⁵ The proverbial elephant in the room across numerous studies adduced by critics of the use of whips in horse racing is the lack of direct evidence concerning the physical effects of the whip on the horse – more specifically, whether the current whip does in fact cause pain. The same authors repeatedly fail to furnish direct scientific evidence on this issue – instead their arguments are frequently propped up by various other kinds of strategies and speculative approaches. This is, no doubt, explained in part at least, by the fact that assessing pain in horses is more complex, owing to a range of factors, than in other animals. As the authors of a 2014 study conclude

While this study has generated much data on forces and pressures generated by the padded whip in several different situations, how this translates to discomfort or pain experienced by the horse remains unknown. To investigate the welfare concerns of whip use, an objective measurement of pain perception by the horse needs to be explored. Given the intricacies involved in pain perception, this may prove a difficult and complex endeavour. (Noble *et al.* 2014, p. xiii)

Scientific and veterinary evidence confirms that undertaking such studies in relation to whip use would be very difficult indeed. The latest studies on the question of pain assessment in horses indicate that establishing a baseline for pain in horses is in fact quite a complex issue, even when it comes to much more obviously distressing experiences such as castration:

The recognition and alleviation of pain is critical for the welfare of horses. Although considerable progress has been made in understanding physiology and treatment of pain in animals over the past 20 years, the assessment of pain in horses undergoing management procedures, such as branding, pin firing and castration, remains difficult and frequently suboptimal. (Dalla Costa *et al.* 2014, p. 2)

What is more, Noble et al.'s study found that the forces generated by the padded whip in ride out situations are typically comparable and indeed often less forceful than the forces generated by routine husbandry activities, activities that would never normally be characterised as cruel such as girthing, patting or brushing. Thus, the situation is not nearly as cut and dried as some of the authors we examine below would have us believe. We cannot hope to settle once and for all the issue as to whether the use of the padded whip is acceptable within horse racing. There is simply not enough evidence to make an informed judgment on this as things stand. However, we can hopefully offer some balance in a debate that has remained largely one-sided in the academic/scientific literature to date and, hopefully, offer a corrective to some of the more problematic tendencies in that literature.

There are three main topics which are currently considered as part of the debate concerning the use of the padded whip: safety, encouragement, and pain. Many critics are willing to concede that the whip remains necessary for safety but wish to prohibit the use of the whip for encouragement. Their arguments typically rest on the assumption that the padded whip is painful and thus should only be used in emergency situations where the welfare of the horse and rider are imperilled. Other critics have gone further and argue against the necessity and/or efficacy of the whip entirely. They insist that the instrument is not only painful but that it is an impediment to the horse in terms of steering (thus rendering its relevance for safety obsolete). Some have even gone so far as to argue that the whip has a detrimental effect on the horse in terms of maximising their performance.⁶ As we shall try to demonstrate in what follows, many of these arguments are excessively speculative. Less speculative arguments would most likely make pain the central focus of their approach. It may be that the lack of concrete evidence relating to pain is, in part, responsible for some of the more problematic argumentative strategies deployed with respect to encouragement and safety in particular.

Encouragement

A recurring problem across a number of studies on this issue is the lack of data concerning the views of industry professionals – specifically in this case, jockeys. In one article on the issue of speed and encouragement the authors acknowledge that they had ‘no data on the jockeys’ beliefs or their trainers’ instructions’. (Evans and McGreevy 2011, p. 4) There is one survey gauging jockey’s attitudes to the padded whip, its function, and whether or not they believed it was painful to the horse. This particular study is problematic for a number of reasons, however. First, the authors acknowledge that only 24 jockeys across three racing jurisdictions responded to the survey.⁷ Thus, there are already questions regarding the reliability of the results. More problematic however is the scarcely disguised disregard the authors exhibit for jockey expertise in the body of the report wherever jockeys’ responses are incompatible with the views of the researchers:

Only 2 jockeys agreed that if all jockeys are allowed to use the whip only for steering purposes, but not for acceleration, races would be fair. Similarly, only 2 jockeys agreed that in hands and heels races, where no jockey is allowed to carry a whip, the fastest horse that is ridden the best should win. It would be interesting to explore which influences jockeys believe have a bearing on the outcomes of such races [perhaps they should have asked them – but presumably they believe that free going types might well finish in front of horses that have more ability than them] . . . Given that only 5 acknowledged that they sometimes feel under pressure to whip more than they would like to, **the implied confidence among the respondents that they know exactly how many times to strike a horse is remarkable.** (McGreevy et al. 2013a, p. 104. Emphasis added)

This is not exactly the kind of analysis and opinion that is likely to encourage jockeys to rush forward to collaborate with these researchers in the future. Indeed, on two occasions they accuse the jockeys of contradictory opinions in such a way as to make the jockeys sound rather foolish (and thus an unreliable source of evidence):

There was no disagreement with the suggestion that whip use is essential to get the best possible finishing position, but one-third of respondents also acknowledged that some horses move sideways dangerously in response to whip use. How these 2 apparently contradictory perspectives can sit together merits further investigation. (McGreevy et al. 2013a, p. 100)

They repeat the claim later in the report. However, only one third of these jockeys hold this allegedly contradictory view and they agree that 'some' not 'all' can react to the whip in this way. Furthermore, the two positions are not mutually exclusive. It may well be true that not all horses respond to the whip in a uniform way. Indeed, many jockeys would openly aver that a small percentage of horses respond better to hands and heels encouragement than to the whip (one of the responses in the survey indicates as much). And, some (again – a very small percentage) might shift or move away from the whip. That is not inconsistent with the belief that the vast majority of horses respond appropriately to a jockey's urgings with the padded whip. Otherwise, jockeys who notably didn't use the whip on certain horses that enjoyed a lot of success would presumably have retained this whip-free tactic on other horses. It seems at least plausible to conclude that the reason they don't is because this strategy doesn't work in the vast majority of cases. It is interesting to note that the majority of the jockeys, twice as many as those who agreed to the above, concede that some horses 'slow down' in response to whip use. Given that McGreevy and McLean, for example, have both tried to argue that the whip is detrimental to performance, one might have expected this result to be invoked elsewhere.⁸ However, it may well have undermined their arguments since they presuppose jockey ignorance as part of their explanation as to why jockeys use the whip when it has an adverse effect. (McGreevy 2011) The findings here, however, indicate that jockeys are aware that some horses respond negatively and even slow down while others (more than 'some' one would assume) respond positively.

Returning to the 2011 study by Evans and McGreevy, the authors make the following telling concession

it remains possible that whip use in the final stages of a race really does improve relative performance at a stage when all horses are slowing, but more frequent and sensitive methods of measuring velocity may be required to detect such a cause and effect linkage. (Evans and McGreevy 2011, p. 4)

It is rather surprising then to see the same authors frequently invoke this study as proof that the whip is entirely ineffective when they clearly acknowledge within the same study that all they have demonstrated is the need for further research.⁹ The authors of a number of articles further interpret the evident deceleration of horses towards the end of a race as proof positive that the whip does not make horses run faster. (Evans and McGreevy 2011, McGreevy *et al.* 2018, p. 1, 4, 2012) Indeed, this is adduced as proof of the *inefficacy* of the whip as an instrument for encouragement altogether. The same authors insist that the whip is intended to make the horse go faster and then insist that because the horses are going slower within the same period of the race as when they are subjected to the most strikes, that this is evidence of the inefficacy of the whip. (Jones *et al.* 2015, p. 141) But this is a precipitous inference. The whip in these instances can also be understood as encouraging the horse to continue to give its maximum effort, even though it may be going slower than at an earlier stage when it was accelerating into a potentially race-winning position. A prevailing belief among people involved in the breeding, training and riding of thoroughbred racehorses is that a significant number of racehorses have a pronounced tendency to slow down as soon as they overtake all of the other horses they are racing with. Indeed, there are good reasons to suppose that this is an innate behavioural characteristic in many thoroughbreds.¹⁰ If that is correct,¹¹ another way to interpret these situations is to see jockeys as using the padded whip to remind the animal not to decelerate too much or to stop giving their maximum effort just because they have managed to get their heads in front of the other horses that are in full flight. Horses *rarely* run as fast in the final 200 metres as they do in sections immediately prior to that. That does not mean that the use of the whip is ineffective or, as has been suggested by McLean and McGreevy, that it is *causing* them to decelerate.¹² This is an unwarranted inference. In other words, even if the last furlong of a race is almost never the quickest furlong, that is not to say that a horse is slowing down *as a result* of the whip being used or that the use of the padded whip has not encouraged the horse to try harder than it otherwise might. Rather, it is every bit as plausible to suppose that jockeys are urging their mounts to keep

trying for the last 200 metres or so to hold their position or to outstay their rivals. In the absence of definitive scientific proof, one can argue that, from the standpoint of explanatory success or poverty, the argument from innate behavioural characteristics is a viable alternative explanation in some instances.

It would have been interesting to see how jockeys would have responded if the same authors who conducted the jockey survey (but who also argue that the whip has a negligible and potentially adverse effect on the horse's ability to accelerate) had asked jockeys why they continue to strike horses in the final furlong of a race if they run slower as a result. If striking their mounts actually produces adverse effects and makes them run slower, it is hard to imagine that some jockeys would not have figured this out by now and thus enjoy a considerable advantage over their rival jockeys. Not least when we can see that the majority of the jockeys surveyed are already aware, apparently, that 'some' horses 'slow down' in response to whip use. That would suggest that they themselves are able to detect both positive and negative responses to the padded whip. There appears to be a failure then to consider some plausible alternative explanations in this context.¹³ It is certainly unfortunate that within the same study jockeys were not asked why they consider the use of the whip for encouragement to be effective at a stage in the race when the horses appear to be decelerating?¹⁴ A more comprehensive study (with a larger number of participants) would certainly be worthwhile, and this would be a key question.

To be fair to McGreevy and his co-authors, they do suggest that their findings indicate clear directions for further research. Alas, no such research appears to have been undertaken until very recently with the publication of a paper comparing the times of races both with and without the use of the whip.¹⁵ The authors of that paper concede that their selection 'does not hold the typical weight ascribed to a control group'. They also acknowledge that the horses selected for whip-free races were deemed suitable for apprentices. That already makes it difficult to measure these kinds of contests against races involving professionals dealing with possibly less tractable sorts. In other words, stewards' reports may not be all that informative in these contexts. They are, after all, looking at reports concerning pliable/experienced horses who are deemed suitable for such races. Why are these horses suitable and not others? Does this not amount to an inadvertent concession that the whip is, in fact, needed by jockeys if they are going to ride certain horses? It is also hard to see why over half a second was not considered a significant difference in race times; in flat races (which is what the authors examined) half a second would be a significant difference. One might also wonder as to why the authors think that it is acceptable for whips to be used on two-year olds in Norway? Is it because they do in fact work, and are not an aversive stimulus, and do aid with steering? There is also consistent evidence of question begging in the paper – assuming, for example, that the whip is aversive and painful when the same authors repeatedly acknowledge in other papers that there is no scientific evidence to support these claims.

Another argument found in the literature on this topic revolves around the idea of negative reinforcement and aversive stimuli. The idea here is that, from a behavioural point of view, the use of the whip is completely perverse in terms of trying to elicit the best possible performance from a racehorse. According to McLean, for example, the way negative stimuli work when it comes to the training of horses is such that it is the *removal* of the aversive stimulus when the horse responds accordingly that produces the desired behaviour – the animal is rewarded for responding in the appropriate way. The corresponding objection to the use of the whip that stems from this rests on the assumption that the whip is being used when the horse is already giving the appropriate response; thus – jockeys who use the whip at the end of a race are sending confusing signals to the horse. (See footnote 13. See also McLean and McGreevy 2010) There are a number of problems with this line of reasoning. For one thing, when horses are not travelling at top speed in the final metres of a race – the assumption is that they are being encouraged to keep trying when they have nothing left to give. However, this is an unwarranted assumption. Noble et al offer an alternative interpretation

the use of the whip is misunderstood by many people. Despite popular opinion, jockeys endeavour to use the whip to maintain speed, not to make the horse go faster. They ride the horse hands and heels up to speed and then use the whip to maintain the speed, if necessary . . . The decision to use the whip is far more complex than simply trying to make a horse run faster. The Evans and McGreevy (2011) study was based on retrospective inspections of recordings of races timing the horses in three sections of the race from 600 m from the finish. Their results indicated that there was no response in speed over the final 400 m or 200 m distances that significantly influenced the likelihood of finishing in the first three placings. However, this is not surprising as a racehorse can only maintain top speed for a few seconds and this typically occurs well before the finish line. (Noble et al, pp 1–2)

Horses that hit the front before the end of a race can often visibly slow down as soon as they have overtaken all of the other horses. They may well be more than capable of keeping up their gallop but may not keep trying unless they are encouraged by their jockeys. The fact that horses are not going as fast in the final 200 metres, for example, does not necessarily mean that they are giving their all for every metre that they are not encouraged. It is also not necessarily the case at all that horses are fatigued or exhausted at the end of a race even if they are not travelling quite as quickly during the last furlong or so. There is the further fact that many racetracks (in Ireland and the UK for example) have an uphill finish and there may well be evident and perfectly normal deceleration as the horses finish the race galloping uphill. Finally, many jockeys try to get their mounts to travel at top speed *into* a race winning position – this usually happens before the last section of a race, and it is not possible for horses to maintain their maximum speed for an extended period of time. So, again, there appear to be alternative (and ostensibly more compelling) explanations as to why horses might be travelling just off their top speeds in the last section of a race. Thus, it remains an open question as to whether they are in fact responding appropriately to the stimulus in question – that is – running faster than they might otherwise run. There is the further assumption that the stimulus in question is *pain* or *suffering* which is precisely what remains to be scientifically proven. There is certainly no consensus on the issue. Moreover, and as we argued above, it seems strange to think that if pain is in fact the stimulus, and if horses respond negatively to pain and their performances deteriorate as a result, that not even one jockey in the history of the sport has managed to figure this out and enjoy a considerable advantage over all of their rivals as a result.

In their summary of an article by McGreevy et al, the Australian RSPCA (who retain McGreevy as a scientific advisor¹⁶) insist that jockeys would be unlikely to use the whip if they thought that it did not in fact cause pain:

So-called padded whips do cause pain – they may be less painful than traditional contact whips when applied in exactly the same manner. But jockeys wouldn't use them if they didn't inflict some pain on the horse. (RSPCA)

Once more, this is speculative, and not even one active jockey was consulted with a view to determining as much. Furthermore, within the very article that the RSPCA are summarising – the authors acknowledge on a number of occasions that they have *no* scientific evidence that shows that the whip is a noxious stimulus for horses. And yet, in interviews on the same topic, one of the authors in question (McGreevy) insists that the whip is undeniably painful and that the use of the whip is both cruel and violent: 'it [the padded whip] certainly damages the horse . . . so there is no doubt in my mind that it hurts the horse.' (McGreevy 2011) 'it [use of the padded whip in racing] is arguably the most visible form of violence to animals.' (ABC)

Safety

A similar pattern emerges when it comes to the question of safety and steering. A number of authors insist that jockeys do not in fact need the whip in order to steer their mounts. Again, consultations with jockeys do not appear to have informed this view. Rather the authors, in some instances, simply adduce their own interpretation of photographs during races as evidence. (McGreevy and Oddie 2011) The basic claim is that because jockeys don't have their whips in their outside hands going around turns, that the whip is not in fact used to steer the horse. However, this is a misunderstanding

of the whip's role in terms of steering. Normally – going around turns, jockeys would, for example, shift their weight and encourage the horse to lead with the correct leg; and if the horse is not in fact hanging or veering off course – there would be no particular need to have the whip in either hand. However, if the horse is beginning to veer off course, for one reason or another, one can often see the jockey use the whip as part of their effort to correct the course of the horse. That is why jockeys are penalised for interference or careless riding if they are shown to be holding the stick in the 'wrong' hand when their mounts need to be encouraged to keep a straight line or to correct their course. Notwithstanding, most jockeys carry their whip in their dominant hand unless there is a need for immediate corrective action – and, as anyone familiar with racing would know, such is their aptitude with the instrument (contrary to what McGreevy and Oddie suggest) that changing hands for them tends to be a seamless enterprise. Again, one has to wonder as to *why* the authors of these various studies failed to consult the jockeys on these issues. At the very least, finding out *why* jockeys think that these instruments are effective in terms of safety and steering could have oriented or guided the investigations of the researchers in a way that might have shed more light on this issue. Indeed, in the survey discussed earlier, the authors prefaced their findings with something of an overstatement and without in fact asking jockeys a question on this topic in the same survey:

the putative role of the whip has been brought into doubt . . . by data showing that handedness of riders, rather than direction of racing, seems to be the primary driver as to which hand jockeys use to carry the whip (McGreevy, Caspar & Evans).

Contrary to what the authors of this study suggest, no one argues that the whip is needed to steer horses around turns. The whip is needed when a horse is veering off course or needs to have its course corrected, when it is 'hanging', that is, not keeping a straight line. This can happen anywhere on a racecourse, not just going around turns.

In terms of the one existing survey of jockey attitudes that we do have, it is extremely disappointing that there was such little uptake, not least when many within racing bemoan what they take to be abiding misconceptions concerning the role of the padded whip. However, this situation will scarcely have been ameliorated by the fact that the authors of that study are rather inimical to jockey views, dismissing their expert opinions in their own analysis of the survey, and in some public remarks where they imply that jockeys are simply conditioned into believing that whips are effective (McGreevy 2011). There appears to be a lack of trust that runs in both directions when what is needed is transparency, co-operation and dialogue between all interested parties. Critics of the use of the padded whip need to rethink the way they 'package' and indeed publicise their research. Meanwhile, those working within racing have to work harder to be more transparent and accommodating when it comes to aspects of their sport that are under scrutiny. After all, people working within racing, including trainers and jockeys, are operating with a social licence. Regardless of how misguided they might deem certain objections, when faced with repeated welfare concerns over issues pertaining to certain practices, it is simply not enough to scoff at or dismiss such worries.

Pain

The key issue that goes to the heart of this debate is, in a word, 'pain'. Advocates for the continued use of the padded whip, in accordance with certain guidelines, routinely claim that the instrument does not cause pain to the horse. However, they fail to adduce much in the way of scientific evidence for this view and, as things stand, there appear to be very few studies which have dealt with this topic in any kind of depth.¹⁷ One of the arguments that they do make is that in a state of high, adrenalized excitement, the horse is unlikely to feel pain.¹⁸ However, this seems a rather unconvincing argument at best. If the activity is in fact painful, then the fact that there might be a delayed reaction to the painful stimulus in question does not seem particularly reassuring. Indeed, it doesn't seem very different to someone arguing that it is okay to beat a naughty child with a stick so long as one excites and adrenalizes them sufficiently first. Authors against the use of the padded whip try to use this

particular argument to undermine the position of their opponents – claiming that it begs the question.¹⁹ There are a number of issues with their formulation of this objection – beginning with the fact that they are not correctly identifying a case of 'question begging'. Things get worse when one considers that in response to their opponents offering an argument to the effect that the whip is not painful in a state of high, adrenalized excitement, these authors argue that there would be no reason to use the whip if it was not painful.²⁰ However, they themselves have elsewhere argued that pain is not an effective stimulus for horses and are then trying to refute the claim that the whip is not painful by insisting that if it is not painful, then there would be no reason to use it. But that is to assume that pain *is* in fact an effective stimulus, contrary to what they had argued in the context of speed and encouragement.²¹ What they fail to consider, here and elsewhere, is the possibility that the whip's efficacy has nothing to do with pain in the first place. (McGreevy *et al.* 2012) Opponents of whip use in racing are simply not entitled then to claim that there would be no reason for jockeys to use the whip if it did not in fact hurt. (McGreevy *et al.* 2012, p. 4; RSPCA) Indeed, evidence shows that horses who cannot feel any pain from the whip still respond to the strike – when the skin has been anaesthetized for example.²² Noble *et al.* again present some interesting findings on this issue

The differences in run-time to fatigue showed that use of the whip did have an influence on performance as these horses maintained their speed for longer periods when the whip was used (Table 4.3). This is despite the likely magnitude of force parameters not being particularly great. This supports the jockeys' claim (see Introduction) that the whip is used to maintain speed . . . **The results of this study show that anaesthesia of the skin did not negate the effects of whip use on run-time to fatigue.** (Noble *et al.* 2014, p. 46. Emphasis added)

The findings of this study are, at the very least, consistent with the view that horses are not responding to 'pain' when it comes to the whip and thus represent a clear counter example to that line of reasoning. And yet, horses still respond and appear to recognise that they are being encouraged to maintain their maximum effort. The views that a number of prominent authors take for granted, therefore, are some of the very views which do not stand up to scrutiny – and one cannot already begin by using as a premise for one's argument what remains to be demonstrated, as though it has already been shown to be the case. Moreover, using terms like 'violence' and 'flogging' to describe the use of the padded whip, and characterising the activity as 'painful' and 'cruel' betoken something of a loaded-dice approach.

As Noble *et al.* note

The assumption has been made that the motivation of whips is based on pain (McGreevy and Oddie 2011, McGreevy *et al.* 2013b, Jones *et al.* 2015), this is despite only one study to date quantifying the force generated by a whip (McGreevy *et al.* 2013b). There has been no attempt to put the forces generated into context and compare the parameters generated by the TekScan force sensors with other types of contact that generate force routinely applied to the horse in its daily management . . . Other forms of contact are made with the horse's skin such as patting a horse on the neck as a reward, girthing up the saddle, brushing the coat and using a sweat scraper. These actions would not be considered cruel; however the forces generated from these activities have not been measured. (Noble *et al.* 2014, p. 35)

This prompted the authors to measure the forces of such forms of contact and compare them to the forces generated when horses were struck by the padded whip in ride out situations. The results were telling and certainly help to put 'the impact of using a padded whip on a racehorse into context':

Peak force generated by the routine activities was generally within the range of peak forces generated by the padded whip (Study 1, Parts A, B, C), albeit at the lower range . . . **However, if comparisons are made with the estimated force parameters based on the deceleration of the padded whip during a jump out (Table 1.29, Part D), all parameters are greater for the routine activities.** (Noble *et al.*, pp 35–36 Emphasis added)

In short then, a study that looked to measure the forces generated by a range of equine activities determined that routine activities generate comparable forces to those generated by the padded whip. However, and this is crucial, when it comes to jump out (that is ride out situations) the other, routine activities sometimes generated *more* force.²³ That is not for one moment to suggest that this one study is sufficient or that the case is somehow closed. The study is certainly more comprehensive than the earlier experiment undertaken by McGreevy et al. (2013), and it represents a very clear counter-example to the foundational claims of critics of the use of the whip. It is, furthermore, a study that critics of the whip do not really consider or engage with as part of their own analyses and discussion. Notwithstanding, further research is urgently needed in order to determine whether these findings are reliable.

In their critical response to the BHA's review of the padded whip in horse racing, the authors acknowledge that there is a 'lack of robust scientifically evaluated methods to quantify the effects of whip strikes' and they concede that this 'highlights the need for further research in this area'. They go on to conclude that 'The absence of evidence should not be taken, or presented, as evidence of an absence of pain.' And yet, this very *lack* of scientific evidence is also adduced as support for the claim that the air-cushioned whip is in fact painful to horses: 'we argue **there is sufficient evidence now . . . [to show that] in the absence of evidence to the contrary**, whipping is potentially painful.' (Hood et al. 2017. Emphasis added) This is all the more remarkable when one finds, for example, that some of these authors concede that

Comparative studies in mice and humans have shown that deformation of the skin is likely to be detected by cutaneous nociceptors. **However, equine data on cutaneous nociception are not available, so it is not presently known if such stimuli are noxious in racing horses.** (McGreevy et al. 2012. Emphasis added)

Again, data specific to horses are not available. A previous study on cats involving using an unpadded rod to deliver a noxious stimulus showed that cutaneous and probably deeper (muscle) nociceptors were acutely activated and that repeated application reduced the thresholds for nociceptor activation and enhanced the duration of their responses. **Any extrapolation from the rigid rod used on cats to the unpadded shaft of whip used on racing horses is speculative.** (Mc Greevy et al., 2012. Emphasis added)

there is a lack of peer-reviewed evidence that specifically demonstrates that whipping horses causes pain . . . (Hood et al. 2017. Emphasis added)

Furthermore, the 'evidence' that is summarily dismissed by some of these authors seems rather more robust than they suggest. The authors allow that 'At the racetrack, horses are examined by a BHA Veterinary Officer for the impact of whip use.' This typically takes place when there is a concern that there is a risk to the horse's welfare; for example, if there was a concern that there may have been excessive or incorrect use of the padded whip. The BHA's report states that about 20 cases of suspected weals were examined per year and that the veterinary officers *never* noted *any* 'signs of inflammation, discomfort or pain'. So, in an entire season of racing, there are typically only 20 occasions (on average) where racecourse vets are concerned that a horse might have been hurt by the padded whip. Moreover, when these horses are examined closely, no evidence of inflammation, discomfort or pain has yet been found. To discount this 'evidence' so readily seems rather hasty. Would it not behove the same critics to afford at least *some* weight to the collective observations of veterinary officers, which find, overwhelmingly, that the padded whip, as used in horse racing, does not in fact cause pain or distress to horses?²⁴ To overrule these numerous expert opinions, when, as almost everyone concedes, there is not much scientific evidence to draw upon, seems counter-intuitive. (See Jones et al., p. 143) Again, the impoverished state of the evidentiary base here is inexcusable; but that is even more reason to consider carefully *all* of the available evidence with a view to arriving at informed conclusions.

In another article on the question of pain in horses Justine Harrison stresses the need for heightened vigilance on the part of people involved with horses owing to the possibility that the padded whip is painful. However, in her summary, Harrison inadvertently concedes that, if it is in fact the case that horses are more sensitive to pain than humans, then the whip that is currently used in racing cannot possibly hurt the horse:

Most pain disappears once the cause is removed. However, the horse will continue to associate pain with whatever caused it in the first place. That could be an item of tack like a saddle, or an environment where the pain occurred, for example in the arena or on a particular bridleway. They will also remember who was present, such as the rider or handler. In the future he may try to avoid those 'painful' stimuli. (Harrison and July 2015)

If this is true, and the whip is a source of pain and discomfort to the horse, then one would expect that horses would begin to react the moment they see jockeys who have used the whip on them in race situations. After all, 'Horses forgive, but do not forget. They especially remember bad situations!' (Williams 2004) If the modern air-cushioned whip *does*, in fact, hurt horses – then why do they fail to exhibit signs of anticipation or react to the recognition of something which caused them pain? One could counter that they have been conditioned to accept the use of the whip. However, horses are rarely struck with the whip by exercise riders during the course of routine exercise. Most horses will have little to no experience of the padded whip before they are in a racing situation. And, if it is in fact something that they find to be painful, then one would expect that the majority should balk the very next time they see the track and possibly refuse to race. That is simply not the case however – nor do they buck or plant the moment they see the jockey who rode them previously. After their first racing experience, many should subsequently prove unruly or fractious on their way to the gallops every morning with exercise riders who routinely carry the padded whip. Thus, there seem to be reasonable grounds for supposing that whatever horses *do* feel when the padded whip is used – it may not be something that we would normally identify as or judge to be painful. That is to say, the issue is not nearly as cut and dried as has been suggested in a lot of the literature and commentary on the issue.

A pressing question, then, is *why*, given the obvious and long standing need for concrete, empirical supporting evidence, the researchers and scientists in question consistently fail to deliver it? Indeed, some critics adduce the *lack* of scientific evidence as *support* for their claims – insisting that when no evidence to the contrary exists – it is clear that one must conclude that precisely what the scientific analysis and arguments (which they mean to provide) are meant to be demonstrating is already a given – namely that the modern device causes considerable pain to the horse. But this is the very point that is at issue. Furthermore, despite the fact that many of the scientists and academics in question challenge viewpoints or analyses contrary to their own for not having been published in peer-reviewed scientific journals, these individuals have not yet themselves published anything or conducted any direct scientific investigation into what they all take to be the core issue – namely, whether the air-cushioned whip is *painful* when used according to the rules and regulations. As Noble et al. contend:

there is an assumption [by McGreevy and his co-authors] that the use of whips is associated with significant cost to horses, and this assumption is reflected in the conclusions drawn from the studies. **However, no attempts have been made to objectively identify or quantify the costs accruing to horses from use of whips.** (Noble et al., p. 2. Emphasis added)

Notwithstanding, the conspicuous failure to expand upon and corroborate the findings of the research undertaken by Noble et al. some seven years ago is equally disappointing. It is also highly unsatisfactory that, as things stand, we are completely in the dark as to *why* horses would respond to the impact of an instrument which, allegedly, is not designed to hurt them. Again, and as noted earlier, pain perception in horses in particular is an issue fraught with difficulties. That hardly absolves interested parties or stakeholders from their ethical obligations, namely, to determine once and for all whether the padded whip, used appropriately, is painful, and, if it is not, to explain why it remains effective nonetheless.

Concluding remarks: the way forward

This is clearly an emotive issue for many of the intellectuals involved in the debate. However, there is a disappointing tendency to resort to illegitimate forms of argument and analysis in what are effectively meant to be dispassionate discussions of a scientific or philosophical nature.²⁵ Indeed, in one particularly tendentious article, the authors look to conflate the views of industry professionals and fans of the sport with the attitudes of male domestic abusers. (McGreevy *et al.* 2018, p. 5) It is also not unusual to see highly charged terms like ‘thrashing’ and ‘flogging’ being used. That is not to say that racing governance or industry professionals in turn should be applauded for their approach in all of this. The fact remains that too many key questions remain unanswered, and it is simply not good enough to continue to govern on this particular issue when our cache of evidence is so lamentably impoverished.

As things stand, in terms of concrete, non-speculative, empirical evidence on the specific issue of *pain*, opponents of the padded whip have failed to supply substantive scientific evidence that the padded whip causes considerable harm and discomfort to the horse.²⁶ There are all kinds of speculative claims and attempts at tangential types of analysis and data mining which are ‘re-packaged’ as ‘evidence’ on the issue of pain.²⁷ However, one has to wonder at the repeated failure to furnish any relevant evidence specifically on the question of pain and in particular the physical effects of the padded whip. It is also extremely disappointing that those who disagree with critics of the whip have failed to provide any relevant research or evidence either.²⁸ Concerned parties on the other side of the aisle have managed to produce one study which discredits an earlier study concerning the force of backhand strikes (and which threw up some interesting findings in terms of the relative force of the whip compared to routine husbandry activities). The BHA, for their part, offered a rather unconvincing argument concerning ‘sportsman’s analgesia’, and that is pretty much the sum of what opponents of critics of the whip have offered in terms of scientific evidence on the issue of pain. The onus then is clearly on both the industry and its critics to facilitate and/or support bi-partisan scientific research into issues relating to the use of the padded whip.

The task of gauging and assessing pain in the context of the padded whip will undoubtedly prove difficult and complex. De Grauw and van Loon already concede that ‘Research on recognition and quantification of pain in horses has lagged behind similar work in humans, small animals and farm animals.’ (de Grauw and van Loon, p. 21) Dalla Costa *et al.* similarly argue that

Among the limitations of other routinely used methods of assessing pain in horses, there is considerable concern that prey species have evolved the ability to mask obvious signs of pain under specific circumstances (i.e. the presence of a predator such as humans). (Dalla Costa *et al.* 2014, p. 15)

What is more, even if we are able determine that the whip does not, for example, cause any physical pain to the horse, we are left with the further question as to why it is in fact effective. One possible explanation is that the sound and sensation of the padded whip engages the horse’s fight or flight reflex and encourages the animal to maximise their effort. Is this an excessive type of exhortation? Does it involve an ethically questionable practice in its own right, namely, that of frightening an animal to make it run faster or to keep running as fast as it is able? However, if horses were genuinely frightened, would they be likely to co-operate with the jockey? In other words, if the use of the whip in this instance is something that we might characterise as psychological suffering, and thus is something that the horse finds distressing, why is it that they don’t seem to remember this, anticipate it, and react on each and every occasion that they see a jockey who has ridden them in races or when they are approached each morning by their work riders carrying a similar looking instrument?

Owing to the scarcity of relevant and/or applicable evidence, one might be inclined to invoke the precautionary principle. The argument goes something like this: we don’t know for sure whether the horse is in pain. It may further be the case that identifying and measuring pain in horses is going to prove more difficult than in all kinds of other non-human animals. Therefore, we should abandon the

use of the whip forthwith. However, I think this response is based on a misinterpretation of the (admittedly limited) evidence that we *do* have. One of the things that a study of the forces generated by a variety of everyday equine activities has shown is that the use of the whip in ride out situations generates roughly the same (and often a smaller) amount of force as patting or brushing horses.²⁹ If we *were* to apply the precautionary principle, would we not be forced to abandon these activities as well? We don't know for certain that they do not in fact hurt the horse (although it seems highly unlikely that they do); but, if we want to ban the use of the padded whip, then we would be obliged to ban these activities as well since they appear, in one study at least, to generate comparable and sometimes even more force. This is obviously an absurd result and so the argument in favour of banning the whip on the basis of the precautionary principle can thus be discounted. Granted, it would be rash to suggest that one study is sufficient for the purposes of arriving at an evidenced-based conclusion. However, it is disappointing that critics of the use of the padded whip have failed to take the results of this study into consideration.

A bi-partisan approach to these issues, that openly acknowledges the considerable scientific obstacles facing any attempt to assess pain perception in horses, and that commits to finding some genuine, applicable evidence is, in my view, the only way forward. Questions remain as to *why* the padded whip is effective, and that is unacceptable given the obvious questions the sport repeatedly faces over welfare, as well as the negative optics associated with the use of the padded whip. The jury is still out on whether the padded whip, used appropriately, is a painful or noxious stimulus. We can only hope that fresh evidence will soon be made available that will allow governing bodies to make informed, evidence-based decisions on its future in the sport.

Notes

1. The redesigned whips are called, variously, air-cushioned, padded, shock-absorbing and sometimes just go by the brand name 'pro-cush'. I see no advantage in adhering to one term only and thus use air-cushioned and padded to describe the whip at different times.
2. This would explain why groups such as Animal Aid adopt an incremental approach in the hope that they will eventually chip away at the sport to such an extent that it will eventually disappear of its own accord. See Animal Aid (2016), p. 2.
3. For example, one critic of the use of the padded whip has described it as 'the most visible form of violence to animals'. (Paul McGreevy, ABC).
4. It is worth noting, that even within moral philosophy itself, the arguments against speciesism are not uncontested; furthermore, it remains the case that we live in a society where the rights and/or moral status of non-human animals are simply not afforded the same weight as human beings. To proceed then as though the argument against speciesism necessarily bears directly on any specific issue within the sport of horse racing is not unproblematic. Not least when one considers that, according to one study, only 14% of the UK's population, for example, would appear to be in favour of banning horseracing outright. See British Horse Racing Authority (2011, p. 5.13.) It seems reasonable to suppose that UK attitudes concerning issues such as this would not be out of sync with cultural and political attitudes in other countries and regions where this debate is taking place.
5. For examples of papers that frequently invoke speculation to back up claims concerning the painful and ethically unacceptable nature of the whip see Hood *et al.* (2017) and McGreevy *et al.* (2012).
6. We discuss McGreevy's and McLean's arguments to this effect below.
7. Initially, there were 26 responses, however two results had to be discarded since they were submitted by a racing executive who was trying to demonstrate that 'fallacious responses could be lodged in online surveys'. (McGreevy *et al.*, 2013, 3).
8. We examine some of their arguments to this effect in what follows.
9. It's worth noting here that in the 2013 study that the authors offer a less measured assessment of their findings: 'These data **showed** that increased whip use was not associated with significant variation in velocity as a predictor of superior placing at the finish ... All this evidence makes it increasingly difficult to justify the whipping of tired horses in the name of sport.' (McGreevy *et al.* 2013a, p. 101 Emphasis added) In other instances when referring to the same study, McGreevy claims something much stronger insisting that they have definitively proved in the same study that whip use had zero influence on placing or performance: 'great horsemanship, great horse preparation, great horse genetics are what matters in getting a horse to those critical positions ... whipping makes no difference.' (McGreevy 2011).

10. As Sue McDonnell argues 'my opinion would be that it is really doubtful that a racehorse understands winning or losing a race on the track. It's not that horses cannot understand winning or losing a chase in natural circumstances ... In natural social contexts, horses do seem to "race" one another. Running and jumping in what looks like playful racing is a conspicuous aspect of play among juveniles, especially colts. Among adults, running occurs in a couple of contexts. Both males and females run to escape threats. Adult males also run when chasing or being chased by another male. In those natural social contexts, the behaviour seems to indicate that at some level that they have "won" or "lost".' This would seem to suggest that one reason that a horse might slow down when it overtakes another horse on the track is that they have evolved in such a way as to believe that they have 'won' as soon as they get in front. (McDonnell 2019).
11. Of course, one cannot really prove this definitively through recourse to scientific evidence. As a consequence, one can only hope to argue to the best explanation.
12. McGreevy and McLean have collaborated on this issue going as far back as 2009. In an interview, McGreevy summarised one of their findings as follows: 'It [use of the whip] may even change the stride characteristics. So you may be given the illusion of it changing the horse's speed when in fact it actually is changing the stride lengths. One study of quarter horses, which are raced over quarter of a mile, in the States showed that horses were actually slowing down and their strides were becoming choppy.' (McGreevy 2011) McLean himself describes his research findings as follows: 'NARRATION: Well, I'm convinced the padded whip can inflict pain. But there's other science to suggest that the way many jockeys use the whip doesn't even make horses go faster. In fact, it can do the opposite. Dr Andrew McLean is a zoologist with a PhD in neuroscience. His area is learning theory. He's going to show us why repeated strikes of a whip don't actually work ... Dr Andrew McLean: The basis of training is actually negative reinforcement, the removal of pressure. It's the removal that trains, it's the removal that reinforces the behaviour ... If we kept hitting the horse after the horse has already given the reaction, then the horse doesn't know what the right answer is because we've kept on using an aversive stimulus when he's given the right answer. You're punishing the response you actually intended to produce. Dr Jonica Newby: So you're punishing the horse, it doesn't know what's going on, it just learns ... to tolerate those hits. Dr Andrew McLean: And it learns that when you're ridden, random acts of pain occur, and that's not really a recipe for a secure life.' (ABC).
13. For some informative relevant analyses on this issue see Spence et al. (2012, pp 678–681).
14. It is interesting to note that the personal views of *one* former jockey, namely, John Francome, are taken seriously when there is such scant regard for the views of the current jockeys surveyed. (See Hood et al. 2017, p. 1, p. 23) It does seem somewhat convenient to positively invoke the view of one individual who shares some of their views when all of the evidence they have from active jockeys does not corroborate Francome's analysis. Francome has argued that the whip should be banned forthwith from horseracing and that it would make for better jockeyship and a more enjoyable spectacle. (<https://www.youtube.com/watch?v=itgYGRcDx4U>) Francome was a gifted jockey and remains an exceptional racing analyst. However, it is worth remembering that the redesigned, air-cushioned whip bears no resemblance to the instrument he was deploying with no little vigour in the 1970s and 1980s.
15. See Thompson et al. (2020) 'Is Whip Use Important to Thoroughbred Racing Integrity? What Stewards' Reports Reveal about Fairness to Punters, Jockeys and Horses'. *Animals* 2020, 10, 1985.
16. 'He is a Royal Veterinary College recognised specialist in veterinary behavioural medicine and a member of the scientific advisory panels for RSPCA Australia and World Animal Protection.' See <https://barvets.com/one-welfare-doglogbook-everyday-ethical-challenges/> It is also worth noting that in their critical review of the BHA's report on the whip that McGreevy et al. make a similar claim.
17. The BHA's report concedes that there is very little in the way of scientific evidence to go on in terms of the physical effects of the whip on the horse. One of their recommendations is that further scientific investigation and study should be funded and supported. (British Horse Racing Authority, 3.35).
18. British Horse Racing Authority, 3.15.
19. 'If there is an anti-nociceptive/analgesic state during the race, it begs the question that if the stimulus (the whip) has lost its salience, then why use it at all?' (McGreevy et al. 2012, p. 4).
20. 'Of course, the same line of reasoning would also mean that these horses could not feel the whip, and that argument would render whipping useless.' (McGreevy et al. 2018, p. 7) It is important to note the elision of an important distinction here. Not being painful is not equivalent to asensate. The authors go on to compare those who have a different view about the use of the whip to male domestic abusers: 'Those who believe horses should be whipped may have aligned with this view or may believe that horses that are underperforming deserve physical punishment – a rationale sometimes delivered by those parents who physically abuse their children or by abusive adult partners (most often men).' (McGreevy et al. 2018, p. 7).
21. To summarise – opponents of the whip argue that the whip is painful, they further argue that pain is not an effective stimulus (as demonstrated by the evident deceleration of horses towards the end of a race). Advocates of the continued use of the whip have argued that the whip is not painful and try to offer the sportsman's

analgesia example as evidence. (British Horse Racing Authority, 3.15) The weakness of that argument notwithstanding – the anti-whip authors argue that there would be no reason to use the whip if it was not in fact painful. Thus, their position ends up being self-defeating.

22. This still leaves us with a question: if the whip does not in fact hurt the horse, either in a state of adrenalized excitement or otherwise – then what exactly is it about the strike that provokes the response from the horse? One possibility is that the strike from the padded whip taps into their fight or flight response. To the best of my knowledge, there has been no proper investigation of this.
23. 'It should be noted that the charter for the whip strikes in Study 1, Part A, B, and C was for participants to strike the ballistics gel with the whip with maximum effort. Consequently, the force parameters generated were typically as great as they could be. The force parameters generated by carrying out the various routine activities were created by the researchers applying enough pressure to elicit a response from the horse or at intensities typical of those used. Therefore, it is likely many of the whip strikes experienced by horses in a race are similar in magnitude to force parameters experienced by horses during their daily care, which are not perceived as cruel. This claim is further reinforced by deceleration generated by the track rider in the jump outs. The whip did not typically decelerate as quickly as it did when the riders were attempting to hit the ballistics gel as hard as possible. Given the magnitude of the force parameters estimated from the whip deceleration (Study 1, Part D), use of the whip in a race by a jockey under the rules and supervision of the stewards is likely to generate force parameters similar to or less than those experienced by the horse during routine activities that require physical contact.' (Noble et al., p. 38).
24. This is yet another instance where the critics of the whip acknowledge, contrary to what they suggest in other texts and public statements, that there is no evidence, one way or another, of pain associated with the use of the whip. They further suggest that the reason that the vets in question are unable to identify any evidence of pain is down to inadequate protocols: 'One candidate explanation for this zero prevalence is that the protocol is inadequate to determine whether pain has been caused. This may, in part, be due to the lack of robust scientifically evaluated methods to quantify the effects of whip strikes, and highlights the need for further research in this area. In terms of the Report, this limitation means that it is misleading to conclude that there is no pain from whip strikes (or that this finding has any significant implications as to whether there is pain). The absence of evidence should not be taken, or presented, as evidence of an absence of pain.' (Jones et al, p. 143) Given that the same absence of evidence has been adduced as a reason to assume the presence of pain, this seems less than even-handed. It seems further perverse that from the analysis of photographs and skin indentation that McGreevy and his co-authors are happy to infer a high degree of probability that horses are being subjected to something painful, but that a close physical examination of the horse's skin post-race by a veterinary expert should be discounted as in any way consequential.
25. Caroline Winter is guilty of a question-begging approach in another paper. In order to demonstrate that people involved in horse racing have conflicting values she takes it as a given that horse racing is inherently cruel – not least in terms of the use of the whip. (See Winter 2017) In their response to the BHA's own review of the use of the whip in horse racing Jones et al. refer to the 'inherently noxious nature' of the whip. (Jones et al., p. 141).
26. Even the recent, and evidently rather hurried, study comparing the skin thickness of human beings and horses doesn't really prove anything. For one thing, it confirms that horses *do* have thicker skin than humans, contrary to what had been suggested by some of the authors in previous public statements. Furthermore, the authors still rely on speculation to determine, given what they take to be anatomical similarities between horses and humans, that the padded whip is painful. However, as things stand, we cannot even safely conclude that the padded whip applied with the same force would hurt human beings, never mind a 500 kg animal whose pain perception we already know so little about. See Tong et al. (2020) 'Comparative Neuro-Histological Assessment of Gluteal Skin Thickness and Cutaneous Nociceptor Distribution in Horses and Humans'. *Animals* 2020, 10, 2094.
27. For example, McGreevy and others have repeatedly tried to argue that from their analysis of photographs and video footage of a race in Australia that they can determine that horses are being whipped on sensitive areas of the body and that jockeys are repeatedly making contact with the non-padded area of the air-cushioned whip. However, these arguments are again speculative and rely on a number of assumptions. Firstly, making contact with the part of the whip near the handle is unlikely to cause much discomfort since there is little to no flexibility there. Second, for most of the whips permitted in UK and Irish racing, for example, almost the entire shaft of the whip is covered with the air-cushioned strip. Finally, much of what the authors argue relies on Australian jockeys contravening the rules in terms of making contact with the whip on prohibited areas of the horse. They further acknowledge that this is something that is regulated properly and more stringently by the BHA. Thus, they are making an argument, at best (and it's an important one in its own right), that applies to the laxity of the rules and penalties within Australian racing. For images and design specifications of the whip used in British National Hunt racing, for example, see ProCush Competition/Race Whip, 2020.

28. I take it that part of the problem here for industry professionals and governing bodies is that if they are seen to support studies into issues like this, then the same studies run the risk of being dismissed as partisan or unreliable. One solution here would be for a panel of academics and scientists, from opposing sides of this issue, to agree on some research parameters and to jointly undertake a research project. It would be interesting, at the very least, to see who might refuse an invitation to such an undertaking and why.
29. Again, further studies on this are clearly needed.

Disclosure statement

Professor Mahon O'Brien is the Independent Chair of the British Horse Racing Authority's Ethics Committee.

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