Potential Measures of 'Carefulness' in Show Jumpers

Author(s): Tim Worden, PhD
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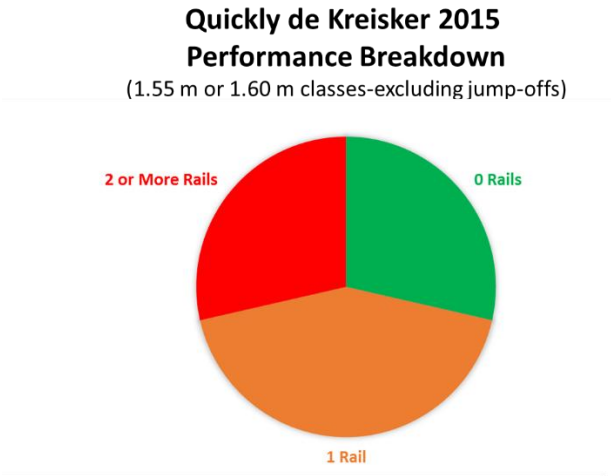
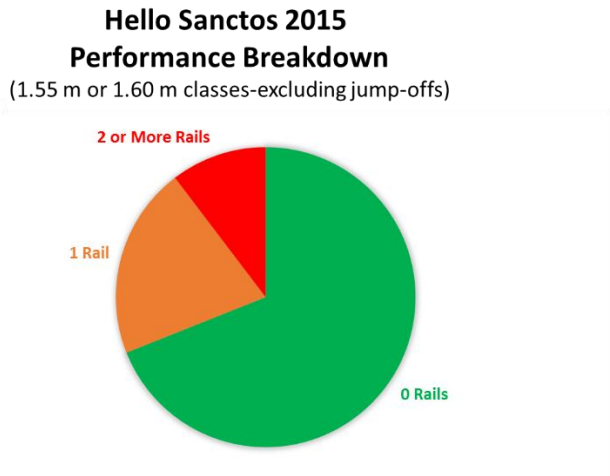
The most important aspect of show jumping performance is the ability of the horse to keep the rails in the cups. Horses that have a relatively low percentage of rails knocked down are termed 'careful', while those that always seem to have a few rails may be termed 'lumberjacks'. One of the central questions of our sport is whether the carefulness of a horse can be predicted early in life: Are there tests that can be done to measure how a horse may perform in the ring later in its' life?

The first step to answering this question is to accept that all horses will have rails; there is no horse in existence that will never knock down a rail. For example, in 2015 Quickly de Kreisker was the top horse (acquired the most FEI ranking points). However, if you look at the figure below, it is readily apparent that this horse did not only jump clear rounds. Instead, only 29% of the rounds at the 1.55 m or 1.60 m height in 2015 were clear rounds. Furthermore, in 2015 Hello Sanctos won the Rolex Grand Slam of Show Jumping (a truly amazing feat). But again, if we look at the horse's competition performances in 2015, we see the gelding was not only jumping clear rounds (69% clear at the 1.55 m or 1.60 m height).





The purpose of this article is not to go into too much detail about why a horse may or may not be careful (I will save that for another day). Instead, I will take a brief look at some interesting experiments that have been done attempting to correlate tests done outside of the ring to show jumping competition results.

Horse Temperament Tests

Certain temperament traits (e.g. fear, boldness) have been associated with show jumping performance. A recently published experiment (Lansade et al. 2016) examined a few tests of fearfulness and attempted to correlate a horse's temperament to performance in the ring. They

measured fearfulness in young horses by examining how the horse reacted to novel objects, novel surfaces, and so on. The researchers then observed the horse's behavior under saddle and during competition. Results indicated that more 'fearful' horses were more difficult to ride (e.g. shying, head throwing, less responsive to rider commands), but were actually less likely to knock down rails as compared to less fearful horses.

Tactile Sensitivity Tests

The same research group (Lansade et al. 2016) also examined the horse's response to touch in an attempt to correlate tactile sensitivity to jumping performance. To do this, the researchers took small probes that apply a very light touch to skin, and applied these probes to the horse's withers area. Horses that contracted the platysma muscle (i.e. quivered) under a lighter touch were deemed to have greater tactile sensitivity. And as we may expect, the horses that are more sensitive to touch are more careful in the ring (having fewer rails). It is possible that the increased tactile sensitivity of these horses caused them to be more averse to touching rails. Another possibility is that this increased tactile sensitivity allows these horses to be more responsive to the rider's cues, which in turn allows the rider to better guide the horse around the course, resulting in fewer faults.

Repetitive Stepping Test

A colleague of mine (Dr. Michel Heijnen) did a fantastic study in humans a few years ago, where adults would step over a small obstacle ~250 consecutive times, and he would count the number of times individuals hit the obstacle. Similar to horses, he observed some individuals hit the obstacle less (more careful) and others hit the obstacle more often (lumberjacks). I replicated his study, but with several different horses (ranging from amateur friendly jumpers to 5* Grand Prix horses). Again, as expected, the horses that are competing at the top of the sport had greater bodily awareness when walking over the obstacle, and hit it less frequently with their legs as compared to less careful horses.

Muscle Fiber Composition

Another often overlooked aspect of a top-quality horse is the composition of its' muscle. For a horse to jump, forces must be generated by muscles in the correct magnitude and timing to perform a powerful jumping movement and raise the body up and over the fence. In very general terms, horses (like humans) have different muscle fiber types. Some fiber types produce low force (slow-twitch fibers), and others produce high force (fast-twitch fibers). Given the requirements of show jumping to generate a large amount of power as the horse takes off for each jump (as well as galloping around the course), it is important to have an abundance of the muscle fiber type that can produce a large amount of force. A research group in France (Barrey et al. 1999) correlated the percentage of fast-twitch muscle fibers in a horse's gluteus medius and biceps femoris muscles

(both muscles are important for generating force on takeoff) to performance in competition. They found that horses with a greater proportion of fast-twitch muscle fibers performed better.

Summary

- Certain behavioral traits correlate with performance of show jumping horses
- Increased tactile sensitivity is correlated with improved show jumping performance
- Bodily awareness as determined by repetitive stepping correlates with performance level in jumping horses
- Percentage of muscle fiber type is related to the performance level of show jumping horses

References

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