

# Evaluation of Horse Comfort in English and Western Riding Style Saddle

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## ABSTRACT

An estimated thirty million people participate in the sport of horseback riding in the United States alone, which means that it is important to investigate how riding affects the horse. This project investigates how the saddles, which are the most distinct differences in the two most popular riding styles, English and Western riding style, affect the comfort of the horse while being ridden. The hypothesis was that horses ridden in English riding style would display more signs of discomfort than horses ridden in Western riding style. Participants started off by tacking up their horse in their respective riding style (IV) and were videoed riding around an arena, following a specific course that included the most common activities a horse and rider would perform in a walking gait. This video was analyzed and the measures of comfort (DV), eye blink rate and behaviors on the horse grimace pain scale, were added up. The experimental results did not support the hypothesis as a chi-squared test conducted for eye blink rate yielded a p-value of 0.662, while the horse grimace pain scale yielded a p-value of 0.2708, which meant that there was not a statistically significant difference in comfort behaviors in English versus Western riding style. The results of this study, if supported by other future studies, can help researchers in the equine field know that when investigating the riding styles and comfort of the horse, their focus can be directed to tack other than the saddle.

## **Introduction**

This project seeks to investigate how the type of saddles typically used in each of the riding styles, English and Western style riding, affects the comfort of the horse while being ridden. As of 2022, an estimated thirty million people participate in the sport of horseback riding in the United States alone. This means that while horses aren't commonly used for transportation and labor anymore, they are still being ridden for recreation, sport, and even therapy. Therefore, a better understanding of the comfort or lack of comfort a horse feels while being ridden in the two most popular riding styles, English riding style and Western riding style, could help riders and their horses develop a better relationship with each other.

There has not been much research done regarding comparisons between the English and Western riding styles. However, one study that has touched upon this topic focused specifically on Dressage as an English riding discipline and trail riding as a Western riding discipline and found that overall, there was no statistically significant difference in discomfort behaviors displayed between Western and English horses (von Borstel et al., 2013). As measures of discomfort, they focused on several things, like certain behaviors of the horses and their heart rates, but mainly on rein tension. Dressage and trail riding are quite different, and these differences go beyond one of them being an English riding discipline and the other being a Western riding discipline. Reining would be considered more of the Western equivalent of dressage, and trail riding generally stays the same between the two riding styles, except for differences in tack, something that will always be there when comparing any of the riding discipline of English and Western riding style. It should be noted that it is Western riders that generally do trail riding, which could be a reason why the study focused specifically on trail riding when they generalized it to Western riding style in the title. Due to these differences, certain measures of discomfort the study used, especially rein tension and heart rates of the horse, likely vary due to the differences in what the horse would be doing in dressage versus trail riding. This means that the

results of the study are more applicable to just dressage and trail riding rather than English or Western riding styles as a whole. Even when making comparisons of the overall riding styles, it is something to consider as it compares aspects of English and Western riding styles that will likely be present regardless of whether specifically dressage or specifically trail riding is present.

So when measuring the comfort of the horses and making comparisons between English and Western riding styles as a whole rather than specific riding disciplines within them, it is important to consider other factors that might affect the measures of comfort in the horse. An example is heart rate, which is commonly used as a measure of comfort in horses. While it can be effective for this purpose, it is a variable that change depending on the gait or the different riding disciplines within English and Western riding styles, which is why it is often used along with other measures to measure the comfort of a horse. Some other ways of measuring comfort in a horse can be more consistent over riding styles and gaits, an example is oral stereotypies which horses display as a sign of discomfort, like crib biting and wood chewing. One study conducted that used oral stereotypies as a measure of comfort in the horse investigated whether management factors of riding styles can be significant in behavioral problems in horses and found that when it came to riding style, oral stereotypies occurred most often among horses ridden in the English riding style (Normando et al., 2011). They concluded that while restrictive stabling was also most common in English riders, it wasn't linked to the oral stereotypies, but the way a horse is typically ridden in English riding style (more physical contact with horse than Western riding style, which might not translate correctly with inexperienced riders) combined with the restrictive stabling could have contributed to overall results of English riding style horses displaying the most signs of discomfort.

There have been studies regarding saddle fit in specifically English riding style or specifically Western riding style and the effects on the rider and horse (including discomfort behaviors), but there is a lack of studies comparing anything relating to saddles between each of the riding styles. For example, a study compared the pressure distribution of two types of dressage saddle (meaning an English riding style saddle) and while discomfort of the horse wasn't one of the main variables being observed, heart rate of the horse was observed. However, no comparisons were made dressage saddles and saddles used in Western riding style. Similarly, as mentioned earlier, studies comparing the English and Western riding styles have been made but none of them focus specifically on the saddle. This study will focus specifically on the type of saddle used in each of the riding style and how that will affect the comfort or lack of comfort in each of the styles. In previous studies where English and Western riding styles are compared and the comfort of the horse is evaluated, English horses usually displayed more signs of comfort. Factors other than the saddle or type of tack used in this type of riding style could have contributed to that, but it is likely that when focusing specifically on the saddles, horses being ridden in English riding style will still display more signs of comfort than horses being ridden in Western riding style.

## Materials and Methods

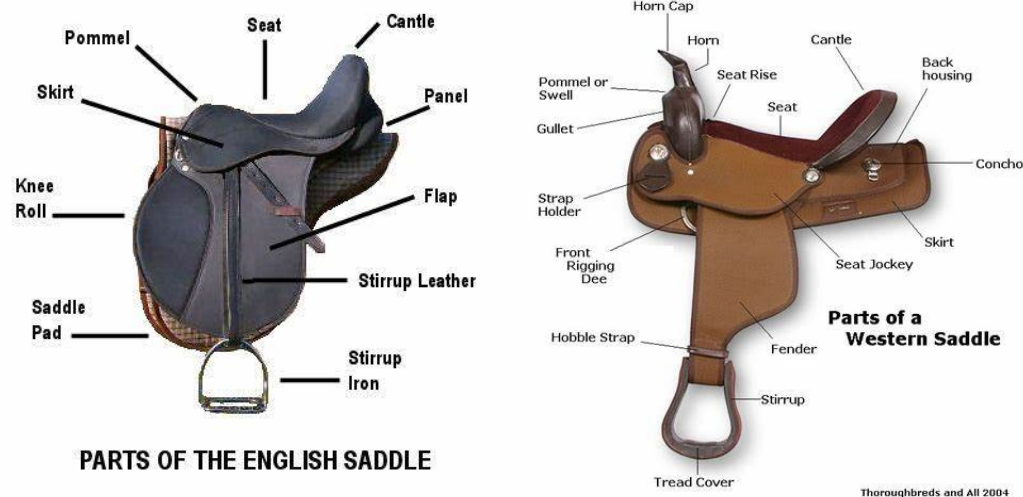
### Participant Recruitment

To avoid sampling bias, random sampling was done when recruiting participants. Flyers that provided a detailed explanation of the requirements and what will be done in the experiment were put up around the area where the experiment took place. In the flyer, a QR code was included that could be scanned to show a link of a survey where people indicate if they ride their horse in Western riding style or English riding style, if they are a minor or adult, if they own a horse that they ride, and if their horse has any health conditions that would make it tired easily. When people responded and fit the requirements (own a horse that they ride, adult, ride the horse with English riding style or Western riding style, horse doesn't have health conditions that make it tired easily), ten participants that responded that they ride in Western riding style were randomly chosen and ten participants that responded that they ride in English riding style were randomly chosen. To avoid bias, someone other than the person conducting the experiment randomly picked

the participants and used a random number generator to assign them their number from one to eight. The eight participants were then prompted to fill out an informed consent form. Informed consent forms with participants' names and other information were filed away during the experiment and won't be referenced to avoid any bias. These were discarded immediately after the experiment is over.

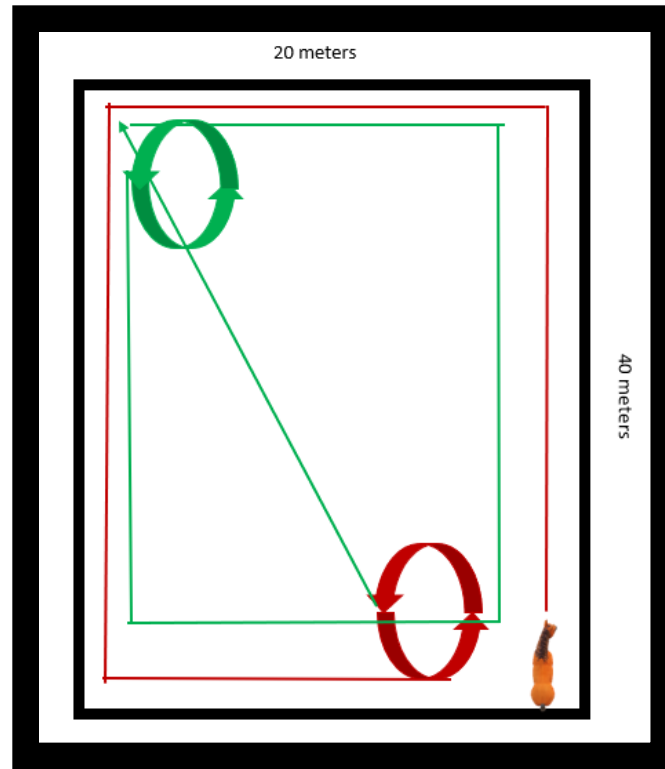
## Experimental Design

There were two experimental groups throughout this experiment as described previously: Western riding style group and English riding style group. Those in the Western riding style group used a Western style saddle (as seen below in Figure 1). These saddles have a horn, skirt, latigo, gullet, stirrup, cantle, and seat. Those in the English riding style group will use an English style saddle (as seen below Figure 1). These are distinguishable from Western style saddle by the lack of a horn in the front. These saddles have a cantle, pommel, skirt, saddle flap, stirrup and stirrup leather and seat.



**Figure 1.** English style saddle is show on the left with the parts labeled. Western style saddle is shown on the right also with the parts labeled. (Robinson, 2022).

Each participant chose to perform their experimental procedure in the arena that they most frequently ride at, as this could reduce chances of a horse displaying signs of discomfort due to unfamiliarity with the environmental rather than anything related to the saddle of the riding style. These arenas often had dimensions of around 20 by 40 meters, although there was a slight variation. Participants started off by tacking up in their respective riding style. When the rider was done with tacking up, they rode their horse around the arena in a walking gait for five minutes for the purposes of warm-up. Once the warm-up was finished, riders had an observer, who was standing a safe distance away from the horse and rider, videotape them completing the procedure described in Figure 2 below. The observer focused on videotaping the horse's head, for the purpose of maintaining participant confidentiality and since the comfort behaviors that were analyzed later were focused on this part of the horse, as the horse and rider rode on the left rein on the track around the area once, then made a circle. They changed direction across the diagonal and rode around the arena on the right rein once and made a 20-meter circle again. A walking gait was maintained throughout this process. This specific procedure was chosen to include as many activities that a rider and horse would normally do in a walking gait. After this process wa over, the rider dismounted their horse, removed tack, and returned their horses back to their homes.



**Figure 2.** Visual representation of procedure participants followed in experiment

The video of the horse and rider walking around the arena was sent to the experimenter and it was then analyzed retrospectively. Several observations were made, including the amount of eye blinks of the horse, which was observed and added up. One blink is defined by when the horse shuts and opens its eye fully. A higher blinking rate in horses is linked to their comfort. The six behaviors on the HGS (horse grimace pain scale), seen in Figure 3 below, were observed in each video by splitting the video into three equal intervals. A screenshot was taken of the horse's head at each interval and the HGS behaviors were observed and averaged for the three intervals, resulting in one value for each horse that was an average of the HGS behaviors seen throughout the video.



**Figure 3.** Behaviors on the HGS (Horse Grimace Pain Scale), also known as FAUs or facial action units, are seen above. Each behavior is rated on a scale of 0 to 2, 0 being not present, 1 being moderately present, and 2 being obviously present. The maximum possible score overall would be 12. (Dalla Costa et al., 2014).

### Data Tables

Shown below are examples of how data tables looked for a horse in English riding style saddle and a horse in Western riding style saddle. Information about the assigned number given to the horse and participant, the riding style, video time, eye blink rate per minute, and the average score for the HGS scale was recorded for each horse.

**Data Table 1.1** – Comfort Behaviors of Horse with English Tack

Horse	Discipline	Video Time	EBR/min	HGS (avg.)
1	English	1:00	27	5.6

**Data Table 1.2** – Comfort Behaviors of Horse with Western Tack

Horse	Discipline	Video Time	EBR/min	HGS (avg.)
2	Western	2:16	28	4.3

**Data Table 1.3** – Raw Data Collection for All Horses

Horse	Discipline	Video Time	EBR/min	HGS (avg.)
1	English	1:00	27	5.6
2	Western	2:16	28	4.3
3	Western	1:26	24	5
4	Western	1:45	20	4.6
5	English	1:40	19	4
6	English	1:22	29	5.6
7	Western	1:20	24	4.3
8	English	1:34	26	5

## Data Analysis

The mean was taken for the values obtained for eye blink rate per minute and the average HGS score for English and Western riding styles. There was only a slight variation in averages for the eye blink rate in English riding style versus Western riding style, as the English riding style average was 25.25 blinks per minute, while the Western riding style average was 24 blinks per minute. Similarly, the average HGS score for English riding style was 5.05, while the average HGS score for Western riding style was 4.55, which meant there was even less of a difference between the two riding style for behaviors on the HGS scale compared the eye blink rates. Nevertheless, the two riding styles showed very little difference in both ways of measuring comfort in the horse. To see if the results were statistically significant, a chi-squared test was performed on eye blink rate and on behaviors on the HGS scale. The chi-squared test yielded a p-value of 0.662 for eye blink rate and a p-value of 0.2708 for behaviors on the horse grimace pain scale. These p-values mean that the results were not statistically significant and there was not a statistically significant difference in the comfort behaviors displayed in English and Western riding style.

## Conclusions and Discussion

After data analysis was completed, which included taking the mean and obtaining the p-value through performing the chi-squared test, it can be concluded that there is no statistically significant difference in the comfort behaviors in the two most popular riding styles, English and Western riding styles, based on this study. These results did not support the hypothesis that horses with English riding style saddles would yield results showing less comfort behaviors.

Possible reasons for these results that were not statistically significant could have been due to several limitations, like the fact that there was only eight participants in the study, four for each riding style. With more participants, it could have been possible that data analysis would show results that a horse in one of the riding style experienced more comfort than the other. It is also difficult to determine whether it was only the saddle in each riding style that caused the results as most riders were not comfortable riding without a bridle and bit, which meant that all riders used a bridle as well as the saddle. These bridles differed slightly between the riding styles and could have been a contributing cause to the comfort the horse experienced as well as the saddle itself. Additionally, there was no control group in this study, although a control group might have caused its own problems. Ideally, this study would have a control group of bareback riders, but it is difficult to find riders experienced enough in bareback riding, meaning that a control group with bareback riders might show results with the horse experiencing discomfort due the rider's lack of experience in bareback riding rather than anything to do with a saddle or lack of saddle.

Despite not yielding statistically significant results, this study can still be helpful to those researching the English and Western riding styles, the differences between the two, and how that would potentially affect the horse. There is already research on rein tension between the two riding styles and how that affects the horse and now that this study showed results supporting the idea that there is not a statistically significant difference between the comfort a horse experiences in one riding style versus the other, those interested in this field of research can focus on tack other than the saddle and reins, for example the girth or cinch. Furthermore, this topic of English and Western riding style saddles and comfort of the horse can still be investigated more thoroughly, perhaps focusing on specific parts of the saddle, as there are not any other published works of research regarding this topic. In the end, the goal is to maximize the amount of comfort a horse experiences while being ridden, so if any research regarding tack in the different riding styles and comfort of the horse do yield statistically significant results where a horse experiences more comfort in one riding style, parts of the tack in that riding style could be implemented into the other riding style, while still maintaining the original purposes of each riding style.

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