

# Qualitative Assessment of Viewpoints on Horses Depending on Livestock Handling Background

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## Abstract

The purpose of this study was to evaluate how individuals with varying livestock handling experiences interpreted equine affective states when presented with various equine images. A free choice profiling survey was distributed to undergraduate students at Oklahoma State University with varying demographics. Students were presented twenty pictures of horses illustrating different behaviors and asked to determine the horses affective state using free choice profiling. Free choice profiling gives the participants the freedom to choose their own descriptive words while describing the whole horse on its affective state. There were 175 responses (n=175) to the survey. Participants were grouped based on their self-assessed livestock handling experience on a scale of 0-100, with 0 meaning no experience and 100 meaning extreme experience. The group from 0-25 was the inexperienced group (IEX), which made up 27% (n=41) of the responses. The group from 26-50 was the moderately inexperienced group (MIEX), which made up 18% (n=28) of the responses. The group from 51-75 was the limited experience group (LEX), which made up 17% (n=26) of the responses. The group from 76-100 was the experienced group (EX), which made up 38% (n=57) of the responses. The responses from each of these groups were compared. Exclusionary criteria was used to limit word choice to only descriptions of affective states. A blinded group with the same demographics (n=5) was provided the selected words that fit the exclusionary criteria and asked to categorize them based on their valence and arousal level. The valence, interpretation of emotional measurements, was either positive (+1), negative (-1), or neutral (0). The arousal, the physiological state of being stimulated, was either high (+1), low (-1), or neutral (0). The mean of each valence and arousal level was used to assign a numerical assessment of the valence and arousal for the selected word. The level of agreement in the quantified groups, consensus, was determined if there was 70% agreeing with both valence and arousal state. Complete consensus in every group was reached for 4 images. In the IEX group, 8 reached consensus, while 3 differed in arousal level, 5 differed in valence level, and 4 differed in both areas. In the MIEX group, 8 reached consensus, while 1 differed in arousal level, 3 differed in valence level, and 8 differed in both areas. In the LEX group, 10 reached consensus, while 1 differed in arousal level, 4 differed in valence level, and 5 differed in both areas. In the EX group, 11 reached consensus, while 2 differed in arousal level, 4 differed in valence level, and 3 differed in both areas. Discriminate analysis and a MANOVA test were performed to determine whether there were significant differences among the groups and if there were differences between independent groups on more than one dependent variable. Out of 20 images, only 1 was significantly different ( $p < 0.05$ ), image 19. The rest were not significantly different ( $p > 0.05$ ). Based on the results, previous livestock handling experience does not influence undergraduate's assessment of affective states of equine.

## 1. Introduction

Horses have been around since the dawn of man. They have been depicted in caves and stories alongside mankind since prehistoric times. Horses were used for everyday labor making them well known around a community. Horses were used to plow the soil, pull carriages, assist in moving other livestock to different areas, etc. Many children would start their day tending to the

horses, livestock and crops before and after school. By doing this type of work, many people were familiar with the emotions or behavioral state of the animals. Without animals, people would not have been able to prosper. Today, many people have been detached from the livestock industry by two or three generations because they now live in urban backgrounds. Less than 2% of the US population is involved in agriculture today (USDA, 2019), with an average age of 57.5 years ("Fast Facts About Agriculture," 2018). Children and teenagers are not as involved with agriculture and livestock as they have been in the past. Training and familiarity with an animal can influence someone's understanding of other animals (Gronqvist, 2017). If someone has experience with cattle or sheep then they should be able to understand horses according to Gronqvist's theory. Livestock can be defined as any animal that is kept on or raised on a farm setting, ranch setting, or commercial enterprise ("Livestock"). Horses are considered livestock based on this definition. According to Gronqvist, someone who has handled livestock other than horses would be able to determine a horse's affective state. An affective state is a longer lasting mood as a response to a multitude of experiences ("Affective States," 2019). Affective state can be anxious, calm, relaxed, etc. all of which use level of valence and arousal to come to that conclusion. Valence is the interpretation of emotional measurements using positive, negative and neutral as value points (Hall, 2018). Arousal is the physiological state of being stimulated using high, neutral, and low as value points (Hall, 2018). When determining the affective state of the equine, for a qualitative assessment of behavior there are many pieces of information that the observer of the animal uses to identify the behavior (Wemelselder et. al., 2000). Techniques that are used look at how the animal is doing something, the interaction it has with the environment, and what the animal is actually doing. When all of this is applied it is known as whole animal profiling. Whole animal profiling assesses an animal's demeanor, body language, and behavior. A qualitative behavior assessment of the emotional state on donkeys on-farms was conducted by Minero (2016). It determined if there was proper training of individuals on the emotional state of the donkey, then they would be capable of properly assessing the welfare of the animal. Minero used whole animal profiling to assess the donkeys and concluded that it only took a few proper trainings before the donkeys were successfully assessed. Accurately being able to assess a horse's arousal and valence levels would be able to benefit horses and people working with them. By using free choice profiling, it gives the participants the freedom to choose their own descriptive words while profiling the whole horse on its affective state. Therefore, we theorize that livestock handling experience should influence the ability to interpret equine affective state.

## 2. Materials and Methods

A Qualtrics survey was administered at the Oklahoma State University (OSU) campus to ANSI 1111, ENGL 3323, and Kappa Delta Sorority in early Fall 2018. The survey was closed in late Fall 2018. In the survey, participants were asked to share their self-assessed level of experience with various animals including horses and livestock on a scale from 0-100, with 0 meaning they had no experience and 100 meaning they had a lot of experience. Following a few questions about their personal backgrounds, the participants looked at 20 images of horses depicting differing affective states and provided their assessment on the affective, or emotional state, of the horse via free choice profiling. Free choice profiling allows participants freedom to choose their own descriptive terms like excited, relaxed, angry, and sad. There were 152 completed responses from the survey (n=152). Based on their responses to level of livestock experience, participants were either categorized as inexperienced (IEX; 0-25), moderately inexperienced (MIEX; 26-50), limited experience (LEX; 51-75), or experienced (EX; 76-100). The responses to

the survey were linked to the group with which the participant identified. If a response contained multiple words, then each word was separated to ensure that each word was compared to the criteria individually. Exclusionary criteria was created to limit word choice. For example, if the response was relaxing then it was converted to relaxed. Exclusionary criteria were used to limit word selection in describing only the affective states. After the exclusionary criteria, 83 words met the requirement. These 83 words were released to five (n=5) individuals of similar demographics (undergraduates) to rank the words on valence and arousal level. The average was created from the five individuals' values for each word for valence and arousal level and assigned to that word. After each mean was assigned to a word, each response for all of the 20 pictures received the same score if it was within the exclusionary criteria. To determine if there was consensus within the groups about valence and arousal levels of the images, mean values placed them within a quadrant. Quadrant I (+,+) had words like playful, accepting, and interested. Quadrant II (-,+) had words like worn out, stressed, and concerned. Quadrant III (-,-) had words like sad, indifferent, and bored. Quadrant IV (+,-) had words like tranquil, relaxed, and at ease. The number of words within a quadrant were then divided by the total number of responses per group for a consensus percentage. Consensus was reached if 70% of responses agreed on valence and arousal levels. A discriminate analysis was done to determine whether significant differences existed among the groups (Discriminate Analysis, 2017). A multivariate analysis of variance (MANOVA) was performed to determine whether there were any differences between independent groups on more than one dependent variable (Taylor, 2014). It compared the centroids (Multivariate Analysis of Variance (MANOVA)). A centroid is a point corresponding to the geometric center of an object (Centroid). If the p-value was less than 0.05, then there was significant difference among the self-assessed handling experience level.

**Table 1**  
X and Y value means for valence and arousal level.

Word	X-Value Mean	Y-Value Mean
Accepting	0.8	0
Afraid	-0.8	0.6
Aggravated	-1	1
Agitated	-1	0.8
Alert	0.6	1
Angry	-1	0.8
Annoyed	-1	0.4
Anxious	-0.8	0.4
At ease	0.8	-1
Aware	0.4	0.2
Bored	-0.2	-1
Calm	0.6	-0.8
Comfortable	1	-0.6
Concerned	-0.2	0.6
Confused	-0.2	0
Content	0.6	-0.4
Curious	0.4	0.2
Defiant	-0.6	1

Depressed	-1	0
Distressed	-1	0.8
Dutiful	0.6	0
Easy going	1	-0.8
Energetic	0.6	0.8
Enjoying	1	0.2
Excited	1	1
Fearful	-0.8	1
Fed up	-1	0.6
Frightened	-0.8	1
Frustrated	-0.8	0.6
Happy	1	0.4
Hurt	-1	0
Indifferent	-0.4	-0.8
Interested	0.4	0.2
Intrigued	0.4	0.4
Irritated	-1	0.6
Joyous	1	1
Loving	1	0.8
Mad	-0.8	0.6
Mindful	0.4	-0.4
Nervous	-0.6	0.2
Neutral	0	-0.4
Not comfortable	-1	0.2
Not happy	-1	0
Not irritated	0	-0.6
Not relaxed	-0.8	0.4
Not threatened	0.4	-0.4
On edge	-0.8	1
On guard	0.2	0.6
Overwhelmed	-1	0.8
Pained	-1	0.8
Peaceful	1	-0.6
Pissed off	-1	1
Playful	1	0.6
Protective	0.8	0.8
Rebellious	-0.6	0.8
Relaxed	0.8	-0.8
Restless	-0.8	0.4
Sad	-0.8	-0.2
Satisfied	0.6	0
Scared	-1	0.4
Settled	0.2	-0.8
Sleepy	0	-1
Steady	0.2	-0.4
Stimulated	0.4	0.4

Stressed	-0.8	0.8
Strong	0.8	0.4
Submissive	-0.2	-0.4
Thoughtful	1	-0.2
Timid	-0.4	-0.8
Tired	-0.2	-0.6
Tranquil	0.6	-0.8
Trusting	0.6	0.2
Unaffected	0.2	-0.4
Unbothered	-0.2	-0.6
Uncomfortable	-0.8	0.2
Uneasy	-0.8	0.6
Unhappy	-1	0.6
Unnatural	-0.6	0.8
Unsure	-0.4	0.2
Upset	-0.8	0.6
Willing	0.6	0.6
Worn out	-0.6	0
Worried	-1	0.6

### 3. Results

Seventy-one percent (n=124) of the students completing the survey were females, 29% (n=50) were males, and 0% (n=1) chose not to identify. Fifty-two percent (n=91) were in their first year at OSU, 6% (n=11) were in their second year, 21% (n=36) were in their third year, and 21% (n=37) had four or more years. Fifty percent (n=87) had non-animal science, non-pre-vet majors, 48% (n=84) had animal science as their major, and 2% (n=4) had pre-vet, but not animal science majors. There were 152 completed responses (n=152) to the survey. For the IEX, there was 27.0% (n=41) who scored themselves from 0-25 on the livestock experience scale. For the MIEX, there was 18.4% (n=28) who scored themselves from 26-50 on the livestock experience scale. For the LEX, there was 17.15 (n=26) who scored themselves from 51-75 on the livestock experience scale. For the EX, there was 37.5% (n=57) who scored themselves from 76-100 on the livestock experience scale. The responses from each group were determined if there was consensus within each group depending on the photo. Of the 20 photos, only 4 had complete consensus (70% of responses agreeing with both valence and arousal level) for each of the groups (IEX, MIEX, LEX, and EX). In the IEX group, 8 reached consensus, while 3 differed in arousal level, 5 differed in valence level, and 4 differed in both areas. In the MIEX group, 8 reached consensus, while 1 differed in arousal level, 3 differed in valence level, and 8 differed in both areas. In the LEX group, 10 reached consensus, while 1 differed in arousal level, 4 differed in valence level, and 5 differed in both areas. In the EX group, 11 reached consensus, while 2 differed in arousal level, 4 differed in valence level, and 3 differed in both areas. The EX group was able to reach consensus more than the other groups. Their responses centered around the same valence and arousal mean values for each of the 11 pictures. The EX group was able to interpret the pictures slightly better than the other groups. After consensus, statistical analysis

was performed. The statistical analysis demonstrated that only one picture, picture 19, had a p-value less than 0.05 meaning there was a significant difference. The other equine pictures all had p-values greater than 0.05 making them not significantly different. The responses that demonstrated no significant difference either focused on one area of the statistical graph or were scattered everywhere on the plot. When the groups were able to reach a consensus, especially in the EX group, this would have made no significant differences in the responses. The participants would have thought the same idea when looking at the affective state of the horse. The EX having similar responses is predictive since they have the background in livestock. In the scattered graphs, this would have been explained in the consensus results, as well. When consensus was not reached between the groups, then no group knew how to identify the affective state of the horse. The answers varied heavily within the group and outside the group making no significant difference.

#### 4. Discussion

This study aimed to evaluate how individuals with varying livestock handling experiences deciphered equine affective states through various equine images. Only one picture out of twenty came back as significantly different between the groups, which indicates no advantage in livestock handling experience. Livestock handlers may not have equine handling experience. Within the same survey, the participants were asked to score themselves on their equine handling experience on a scale from 0-100, with 0 meaning no experience and 100 being extreme experience. There was a total of 174 responses (n=174) for this self-assessment. For the IEX of horse handling, there was 51% (n=88), who scored themselves between 0-25. For the MIEX of horse handling, there was 15% (n=27), who scored themselves between 26-50. For the LEX of horse handling, there was 10% (n=18), who scored themselves between 51-75. For the EX of horse handling, there was 24% (n=41), who scored themselves between 76-100. When the equine handling groups were compared, seven images had the groups being significantly different ( $p < 0.05$ ) from each other. There were only three images that were not significantly different ( $p > 0.05$ ). The self-assessed equine handling response was then compared to the livestock handling self-assessed response.

**Table 2**

Self-assessed livestock handling experience compared to self-assessed equine handling experience

	IEX Equine Handling	MIEX Equine Handling	LEX Equine Handling	EX Equine Handling
IEX Livestock Handling	73% (n=30)	12% (n=5)	0% (n=0)	15% (n=6)
MIEX Livestock Handling	57% (n=16)	25% (n=7)	4% (n=1)	14% (n=4)
LEX Livestock Handling	36% (n=9)	12% (n=3)	16% (n=4)	36% (n=9)
EX Livestock Handling	26% (n=15)	21% (n=12)	16% (n=9)	37% (n=21)

Based on those comparative results, even though someone has livestock handling experience, it does not mean that they have equine handling experience. There were 15 people who identified

as EX in livestock handling experience, but were IEX in equine handling experience. A majority of the livestock handlers did not self-assess themselves as experienced in equine handling, but as inexperienced in equine handling. This study was centered around horses, and many participants would not categorize themselves as experienced in horses, explaining how there were scattered answers all over for some images. Neither of the livestock handling groups were able to determine what the horse was feeling in the image. If the participant had hardly ever worked or been around horses, then something easy to an experienced horse handler could have been difficult to an inexperienced horse handler, making each individual interpret it differently. Many different responses would have been submitted this way creating no significant difference.

There could have been no significant difference in the groups for the different images because the participants all came to the same conclusion. The role horses play in society could explain that result. Horses even though are livestock animals are closer related to companion animals rather than cows, goats or chickens. There are cattle, chickens and goat slaughtering facilities, but no horse slaughtering facilities. People cannot imagine horses being used as food. Today, horses are mostly used for sport. Horses are depicted as majestic creatures that fly with the wind in movies and in shows. There are multiple movies about horses like Spirit, Flicka and many more, but there are hardly any other movies about other livestock. With all of these movies, it has allowed people to generalize the horses in the same way. Horses are depicted the same way in every movie, which would explain as to why the participants grouped together in responses reaching consensus. The EX equine handlers were in various levels of livestock experience. In each of their groups, they would have clumped the groups together, coming to the same conclusion based on the generalized depictions of horses today and their experience, this would explain why the equine handling results had more significantly different responses from each other. Horses are able to give more expression than other livestock species, which would have allowed the participant an easier way of describing the affective state of the horse (Hall, 2018). Horses are able to move their ears many ways for different expressions and flick tails or manes. It makes the horse easier to interpret. Easier interpretations would have focused the groups to one answer providing the no significant difference.

## 5. Conclusion

In conclusion, our findings suggest previous livestock handling experience does not influence undergraduate's assessment of affective states of equine. Many of the findings illustrated that the participants were confused on the equine affective state, so responses were scattered or all came to the same conclusion, so were clumped together. Many of the experienced livestock handlers were not experienced in equine handling. Experienced equine handlers varied in their livestock handling, so were in each of the livestock handling groups. The experienced equine handlers had significantly different responses from the inexperienced equine handlers. Since the experienced equine handlers were scattered in the livestock groups, it would have put the groups at a higher chance of reaching consensus because the experienced equine handlers would have similar responses grouping the groups together for livestock handling. The similar responses would have created the non-significant difference exhibited in the livestock handling groups. By taking this information, when teaching about horses it should be noted that livestock experience does not equate to equine handling experience. It would be best to teach as if all students had no information about horses. Improvements that could be made to the study would be to have accredited livestock handlers take the survey as well, instead of just self-assessed

undergraduates. Further studies can compare the undergraduates results to adults who have been out of college for some time.

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