RESEARCH

Behavior of Circus Elephants During Transport

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Abstract

Circuses, zoos, sanctuaries, and private owners transport elephants for trips lasting from a few hours to several days. This study used time-lapse video to record the activities of elephants hauled in semi-trailers and in rail cars. Bouts of lying down, weaving, and standing were recorded. Video observations of elephants in semi-trailers lasted from 1.7 to 3.8 hours while observations of elephants in rail cars lasted from 40 minutes to 26.3 hours, with the shorter observation periods the result of video equipment failure. The percentage of observed time spent weaving by elephants hauled in semi-trailers ranged from 4.2% to 93.2%, while elephants hauled in rail cars spent zero to 68.5% of observed time weaving. While weaving, elephants engaged in activities such as eating, throwing feed over their back, and looking out the windows. Only two elephants, both of which were transported in rail cars, were observed lying down (2.8 and 4.6% of the observed time). Occurrence of weaving was highly variable between elephants. Because the elephants observed in this study engaged in a range of activities while weaving and were not in a trance-like state, weaving during transport did not appear to be indicative of poor welfare.

Introduction

Various species of animals are transported across the country and around the world to perform, to breed, or to processing plants. Previously, the effects of transportation have been studied on the behavior and physiology of dogs (Bergen et al. 2002), cattle (e.g., Friend et al. 1981; Booth et al. 2001), swine (Busse and Shea-Moore 1999; Apple et al. 2001), goats (Kannan et al. 1999; Das et al. 2001), sheep (Jackson et al. 1999), and horses (e.g., Clark et al. 1993; Friend et al. 1998; Gibbs and Friend 1999, 2000; Collins et al. 1999; Stull 1999; Friend 2000, 2001; Stull and Rodiek 2000; Toscano and Friend 2001). However, there has been very little research on the transportation of elephants until recently.

Transportation is an important aspect of life for circus elephants. Some circuses will transport their elephants to new venues daily, while other circuses may stay in one location for up to two weeks. Large semi-trailers pulled by semi-tractors and rail cars are currently used to transport circus elephants. Trips may cover only a few kilometers and last less than an hour, while other trips may cover more than a thousand kilometers and last several days.

Previous research into the effects of transportation on elephants has focused on physical measurements of the transport environment and changes in the elephants' body temperature (Toscano et al. 2001). Internal and external temperatures, noxious gasses inside the transport vehicles, and body temperature of the elephants during transport were within normal ranges (Toscano et al. 2001). While physical measurements are important, the behavior of circus elephants during transport has yet to be described.

Materials and Methods

Video cameras (Panasonic WV-BP312) were installed in the semi-trailers and rail cars used to haul the elephants in this study, and the videos were recorded on a time-lapse video recorder (Panasonic VHS AG-1070). The tapes were later analyzed to record the time spent performing weaving, lying, and standing.

Weaving was defined as a repetitive shifting of the elephant's weight from side to side for at least 5 seconds (Schmid 1995). A step forwards or backwards was also allowed during a weaving bout. During standing bouts, the elephant was upright but could still move a single step in any direction.

During standing and weaving, the incidence of activities such as eating, looking out the window, throwing food and bedding over their backs, swishing their tail, and moving a step in any direction was noted. The time spent engaging in these activities was not recorded, as the bouts were often very brief.

Carson and Barnes, Clyde Beatty/Cole Brothers, and Hawthorn Corporation transported their elephants in large semi-trailers pulled by semi-tractors. The two Ringling Brothers circuses, Red and Blue, transported their elephants in rail cars that were part of a train owned by the circus.

Carson and Barnes loaded their elephants at approximately 05:30, and they usually unloaded within a few hours. The observed elephants were hauled in groups of two, facing each other in a 2.29 meters wide x 11.06 meters long x 3.30 meters tall trailer.

Clyde Beatty/Cole Brothers loaded their elephants at approximately 22:00, traveled to the new venue late at

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Table 1. Behavior of individual elephants during each trip

Elephant	Circus / Act	Age	Trip	Min. of video	Percentage of observed time spent			Longest weaving bout observed
					Weaving	Lying	Standing	
1	Clyde-Beatty	59	Brooklyn to Stanton Island	177.75	42.2	0	57.6	252
1	Clyde-Beatty	59	Stanton Island to Queens	124.8	49.2	0	50.8	278
2	Clyde-Beatty	57	Brooklyn to Stanton Island	177.75	19.5	0	80.5	610
2	Clyde-Beatty	57	Stanton Island to Queens	124.8	4.2	0	95.8	45
3	Hawthorn Corp.	59	Fort Worth to College Station	379.1	33.3	0	66.7%	907
3	Hawthorn Corp.	59	College Station to Houston	247.7	53.4	0	46.6%	1030
4	Ringling Brothers – Blue	35	LA to San Diego	1528.7	43.1	0	56.9	1216
4	Ringling Brothers – Blue	35	San Diego to Oakland	579.1	61.7	0	38.3	830
5	Carson and Barnes	33		197.5	81	0	19	1980
5	Carson and Barnes	33		227.4	64.1	0	35.9	731
6	Carson and Barnes	35		104.8	64.5	0	35.5	196
6	Carson and Barnes	35		200.9	44.2	0	55.8	1816
7	Carson and Barnes	22		104.8	75.8	0	24.2	330
8	Ringling Brothers – Red	24	Austin to San Antonio	211.7	2.4	36.4	61.2	70
8	Ringling Brothers – Red	24	San Antonio College Station	548.8	88.5	0	11.5	1365
8	Ringling Brothers – Red	24	College Station to Houston	897.3	56.7	2.8	40.5	4500
9	Ringling Brothers – Red	41	Austin to San Antonio	211.7	0	0	100	0
9	Ringling Brothers – Red	41	San Antonio to College Station	548.8	53.5	0	46.5	465
9	Ringling Brothers – Red	41	College Station to Houston	461.1	37.6	0	62.4	750
10	Ringling Brothers – Red	18	Austin to San Antonio	211.7	30.2	0	69.8	1810
10	Ringling Brothers – Red	18	San Antonio to College Station	40.01	23.8	0	76.2	212
10	Ringling Brothers – Red	18	College Station to Houston	899.8	44.3	0	55.7	1935
11	Ringling Brothers – Red	18	Austin to San Antonio	211.7	0	0	100	0
11	Ringling Brothers – Red	18	San Antonio to College Station	40.01	15.4	0	84.6	95
11	Ringling Brothers – Red	18	College Station to Houston	899.1	32.2	4.6	65.2	355

night, and unloaded between 01:00 and 02:00. The observed elephants were hauled facing each other in the 2.44 meters wide x 7.63 meters long x 3.36 meters tall elephant compartment.

The Hawthorne Corporation act consisted of two elephants traveling with Circus Vasquez. They generally loaded the elephants late at night, but there was a lot of variation depending on the distance to the next venue. Like elephants in Carson and Barnes and Clyde Beatty/ Cole Borthers, the observed elephants were hauled facing each other in a 2.44 meters wide x 5.89 meters long x 3.05 meters tall elephant compartment.

Both Ringling Brothers circuses usually loaded their elephants into rail cars shortly after the last performance of the evening. The elephants were loaded at approximately 22:00, and the unloading time varied greatly. The elephants observed in the Ringling Red rail car were hauled side by side in compartments that were 2.80 meters wide x 24.93 meters long x 2.68 meters tall. The elephants observed with Ringling Blue were hauled in single file in elephant compartments that were 2.80 meters wide x 23.83 meters long x 2.50 meters tall.

Results

Video observations of the elephants being hauled in semi-trailers lasted from 1.7 to 3.8 hours (Table 1) with an average length of 3.1 hours (Table 2). Video observations of elephants being hauled in rail cars lasted from 40 minutes to 26.3 hours (Table 1) with an average length of 9.1 hours (Table 2).

It is important to note that the shorter durations of video observations were caused by equipment failure, inadequate lighting, or other technical problems, rather than short trips. Typical trips for elephants hauled in semi-trailers and rail cars were previously described by Toscano et al. (2001). Although the Ringling circuses were very cooperative, the video equipment had to be set up long before the cars were loaded, and we could not troubleshoot the system if something went wrong with the equipment after the initial set up. Also, Ringling Red has a policy of keeping the lights off in the rail cars at night so little video was obtained from that circus after dark. Interestingly, Ringling Red had the only elephants who we observed lying down during transport.

Percentage of observed time the elephants who were

Table 2. Overall means for data collected

vehicle	Duration of observation(minutes)	Observed time spent weaving	Observed time spent laying down	Observed time spent standing	Longest weaving bout observed (seconds)
	187.9	48.3	0	51.7	743.8
	543.5	35.2	2.7	62.2	864.2
ed	398.6	40.5	1.6	57.9	826.7

hauled in semi-trailers spent weaving ranged from 4.2% to 93.2% (Table 1) with an average of 48.3% (Table 2). For the elephants hauled in rail cars, the percentage of observed time spent weaving was between zero (no weaving) and 68.5% (Table 1) with an average of 35.2% (Table 2).

Two of the elephants hauled by Ringling Red spent 2.8% and 4.6% of their observed time lying down (Table 1). Those elephants probably spent much more time lying down, but we lost useable video due to poor lighting at night. No other elephants spent any time lying down while we were observing them.

Elephants who were hauled in semi-trailers spent between 6.8% and 95.8% (Table 1) of their observed time standing, with a mean of 51.7% (Table 2). The elephants who were hauled in rail cars spent between 11.5% and 100% (Table 1) of their observed time standing, with a mean of 62.2% (Table 2).

The longest observed bout of continual weaving by an elephant hauled in a semi-trailer was 33 minutes (Table 1) and occurred while the trailer was moving. The longest observed bout of weaving by an elephant hauled in a rail car was 75 minutes (Table 1). We could not determine whether or not the rail car was moving during this bout.

In addition to weaving and lying down, elephants often took one to two steps from side to side or forwards and backwards, they swished their tails, they ate, they looked out the windows, and they threw hay over their backs during transport. The elephants performed these behaviors both while weaving and standing.

Discussion

In this study, transported elephants spent from zero to 88.5% of observed time weaving as compared to picketed circus elephants who spent from zero to 33% of their time per day engaged in weaving (Friend 1999). The picketed circus elephants also displayed head bobbing which was not displayed by the transported elephants used in this study.

Horses display weaving by moving their entire body side to side, swinging the forequarters from side to side, or swinging their hindquarters from side to side. Weaving is considered to be indicative of poor welfare in horses (Mills et al. 2002). Performance of horses may be inhibited by weaving and the percentage of time spent weaving increases prior to feeding (Cooper et al. 2000). However, this does not appear to be the case in elephants during transport. Many of the elephants were observed weaving as they ate and after they ate, with no observed change in the amount of weaving in relation to feeding time during transport. Additionally, no health or performance problems were associated with the elephants who spent a larger percentage of their time weaving.

The causation of weaving during transportation is difficult to explain. The general causal factors such as anticipation of feed, water, and performance are not present during transportation (Friend and Parker 1999; Friend 1999). Elephants who were never observed to weave when outside the trailer or rail car commenced weaving shortly after entering the trailer or rail car. All elephants we observed loaded readily. The primary role of the trainer was to assist loading and make sure loading was done in an orderly fashion. On one occasion with Clyde Beatty, the trainer released two elephants who were about 30 meters from their semi-trailer with the command "go home." The two elephants raced each other back to the semi-trailer, entered the semi-trailer head first, and then backed in and commenced eating vegetables that were in the semi-trailer. One of those elephants also immediately commenced weaving once she started eating. We never observed elephants being forced into a semi-trailer or rail car. Rather, our observations are consistent with several elephant trainers who believe their elephants consider their transport vehicle to be a safe, secure place; that is, "home."

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