

## Assessment of environmental enrichment for Asian elephants in zoos

Environmental enrichment (EE) aims at stimulating natural behaviours in captive animals, by offering some biological relevant resource. Here, I assessed the importance of an EE, a shower, to two Asian elephants by letting them work for access to it. My findings indicate a moderate or low motivation for access to the shower, as compared to access to 5 kg of hay.

In elephants foraging behaviour, vocal and olfactory communication as well as bathing and social behaviour might be possible to stimulate in this way. However, it is important to have a scientific approach towards environmental enrichment and to evaluate its effectiveness<sup>1</sup>.

Wild elephants have been observed to find water at least once a day<sup>2</sup> whereas zoo elephants often have little opportunity to express bathing behaviour. The subjects of this study were two female Asian elephants, Saonoi and Bua, housed at Kolmården Wildlife Park, Sweden. During the winter they are kept indoors all the time, and bathing is limited to daily showering by their keepers. I therefore decided to use a spurting water hose (shower) as enrichment.

There are various methods of measuring animals' motivational strength, some of them using an economical approach. In the present study I used the maximum

price paid concept. The elephants had to lift weights, by pulling a rope with their mouth and trunk, to switch on the water hose. The experiment was repeated once a day, with increased weight, according to a predetermined schedule, until the elephant had reached her maximum. To be able to estimate the motivational strength for access to a particular resource a comparator is needed and in this study access to 5 kg of hay was used. Food is often used as the comparator since its value varies rather predictably, depending on deprivation level. If the maximum price paid for access to a resource is at the same level as for access to food when hungry, the motivational strength for a single access to the resource can be assumed to be strong<sup>3</sup>. Since the elephants got their latest meal about 17.5 hours prior to the test I expected them to be highly motivated in the comparator test. This prediction was also supported by the results: Saonoi paid 454 kg and Bua 381 kg for access to the hay, which was 1.47 and 1.61 times more than they paid for access to the shower. Do these results indicate a small or a large motivational strength for access to the enrichment then?

By looking at the percentage of time the elephants spent using the shower during the

first 15 min, some further information can be revealed. Saonoi used the shower to a large extent, between 63 and 98 % of the time in each session. Bua, on the other hand, showed lower interest in the enrichment and had a usage between 0 and 34 %. These results are consistent with the maximum price paid results: Saonoi lifted heavier weights and also used the shower to a larger extent, compared to Bua. The difference between the elephants might be explained by the social context. The animals were separated by an electrical wire during the experiment, an unusual situation for them, since they are kept together most of the time. Elephants are highly social animals<sup>4</sup> and Bua might have been very dependent on Saonoi and therefore unwilling to use the shower on her own.

In conclusion, the maximum price paid method can be used to evaluate environmental enrichment for zoo elephants. The elephants in the present study both lifted heavier weights for access to 5 kg of hay than for access to the shower, but the usage of the enrichment differed between the animals. The shower might be used as an enrichment, but is probably of different value to different individuals. It is also important to take the social context into consideration.

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1. Newberry R.C. *Appl. Anim. Behav. Sci.* **44**, 229-243 (1995).
2. McKay, G.M. *Behavior and ecology of the Asiatic elephant in southeastern Ceylon*. (Smithsonian Institution Press, Washington, 1973).
3. Kirkden R.D. & Pajor E.A. *Anim. Welfare* **15**, 119-130 (2006).
4. Schulte B.A. *Zoo Biol.* **19**. 447-459 (2000).