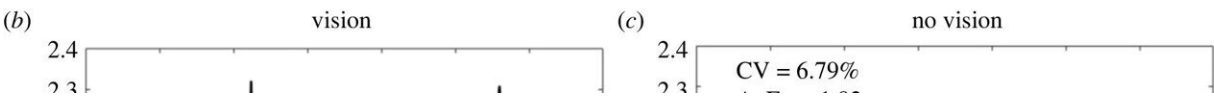


Blindfolded elephant experiments suggest the animals rely on eyesight to maintain balance

September 27 2023, by Bob Yirka



Depiction of the experimental set-up for the "no vision" condition where the trailing elephant was walking with a blindfold while instrumented and holding on to the tail of the lead elephant. A lead elephant was necessary for maintaining a sustained and consistent walking speed. Representative stride time interval time series are also shown for an elephant while walking with vision (b) and without vision (c). As shown, the stride time intervals visually appear to have more overall variability and are less consistent during the "no vision" condition. These observations are confirmed by the coefficient of variation (CV) and approximate

entropy (ApEN) values that show there was more variability overall in the stride time intervals, and the stride-to-stride variations in the time intervals were less consistent without vision. Credit: *Biology Letters* (2023). DOI: 10.1098/rsbl.2023.0260

A pair of researchers, one a neuroscientist and physiologist at Boys Town National Research Hospital, the other an evolutionary biomechanics professor at the University of London, reports that elephants rely on their eyesight to maintain their balance. In their study, published in the journal *Biology Letters*, Max Kurz and John Hutchinson conducted experiments with trained captive elephants.

Prior research has suggested that [large animals](#) are more at risk of injury from falls than are smaller animals—and the risk only grows worse the bigger an animal gets. For [elephants](#), a fall could be deadly due to internal organ damage or broken bones. For that reason, maintaining balance is critical for elephants.

Prior research has also shown that different animals have different mechanisms involved in maintaining balance—humans, for example, rely on feedback from their limbs and the vestibular system inside the inner ear. In this new effort, the researchers sought to discover how elephants maintain their balance.

Suspecting that eyesight plays a major role in maintaining balance in Asian elephants, the researchers contacted trainers at Have Trunk Will Travel, a company that trains elephants for use in movie and television roles. Together, the researchers and the training team created huge blindfolds for four Asian elephants. They also strapped GPS trackers to their torsos and accelerometers to their feet. Together, the sensors allowed for monitoring the movements of the elephants and their gait,

including the time it took for each footfall to occur.

Next, the handlers asked the elephants to walk single-file in pairs along a path, with the lagging elephant holding the tail of the leading elephant with its trunk. For some walks, the following elephant was blindfolded, for others, it was not.

The researchers then looked for differences in [sensor data](#). They found that timing of footfalls was inconsistent with the elephants that were blindfolded—in some cases, the elephants had difficulty maintaining their stride. The researchers suggest that elephants use their vision as a means of timing their steps, which is how they maintain their balance.

More information: Max J. Kurz et al, Visual feedback influences the consistency of the locomotor pattern in Asian elephants (*Elephas maximus*), *Biology Letters* (2023). [DOI: 10.1098/rsbl.2023.0260](https://doi.org/10.1098/rsbl.2023.0260)

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