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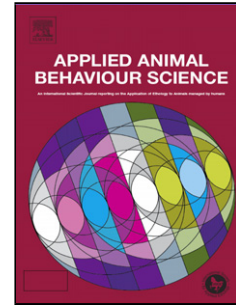
Title: Assessing the Dyadic Social Relationships of Female African (*Loxodonta africana*) and Asian (*Elephas maximus*) Zoo Elephants using Proximity, Tactile Contact, and Keeper Surveys

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Assessing the Dyadic Social Relationships of Female African (*Loxodonta africana*) and Asian (*Elephas maximus*) Zoo Elephants using Proximity, Tactile Contact, and Keeper Surveys

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Highlights

- Elephants spent less time and were more variable in expressing tactile contact than proximity.
- Keepers had excellent levels of agreement in rating elephant bond strength.
- More time and consistency in proximity by elephants predicted “strong or strongest bond” ratings by keepers.

Abstract

Understanding the affiliative social relationships, or bonds, between zoo elephants has implications for both their welfare and management, yet there is limited work assessing and describing these bonds. Consequently, there is a need for the development of a reliable assessment tool. We used multiple metrics of proximity and tactile contact, as well as keeper surveys, to assess the social bond strength of 41 elephant dyads from 22 different zoos. Survey descriptions of social bond strength were based on previous research and included proximity and separation-reunion behaviors between individuals in a dyad. Approximately half of the elephant dyads in our study were rated as having a “strong” or “strongest” bond by keepers, who showed excellent agreement in their ratings of elephant bond strength (ICC(1,k)=0.82). Elephant dyads that spent more time in proximity (within two elephant body lengths), and those that were more consistent in this behavior across time had an increased predicted probability of being rated as having a “strong or strongest bond” by keepers ($p < 0.001$; $p = 0.002$; respectively). Affiliative tactile contact within dyads, described using duration, diversity, symmetry, and variability

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