SUPPLEMENTARY DISCUSSION

Previous studies have found stage of gestation correlates positively with fGCM concentrations in African elephants[1] and lactation correlates positively with circulating GC concentrations in captive Asian elephants (*Elephas maximus*)[2]. In our study, pregnancy was only slightly correlated with higher fGCM levels and not significantly, perhaps due to our course 0/1 categorization that did not incorporate stage of gestation. Moreover, lactating elephants had lower fGCM concentrations. albeit only slightly and not significantly. This may be because lactating females release more oxytocin, a hormone that inhibits adrenal activity and lowers GC secretion[3–5], which may have counterbalanced the energetic demands of lactation. (Oxytocin may further be the mechanism by which social buffering attenuates GC secretion; affiliative physical contact has been documented to release oxytocin in contexts unrelated to nursing and reproduction[4,6].)

We did not find that GC secretion increases with age in African elephants similar to Oduor *et al.* (2020)[7]. This may be because we did not sample from a wide age range, given elephants can live to be greater than 60 years old in the wild (Supplementary Fig. 1). Differences between mature adults and young adults or calves may have been apparent if we had sampled from more coarsely separated age classes. Time of day showed an effect on fGCM concentrations in zoo elephants, with concentrations highest in the morning and lowest around midnight [8]. We did not sample across a large time range (Supplementary Fig. 1C), and this could have obscured a similar effect in our study system. Zoo elephants may also have different diurnal rhythms than wild elephants after adjusting to human-driven schedules.

We suspected the resolution provided by fine-scale information on strongylid fecal egg counts from the same dung boluses sampled for glucocorticoids would unveil a positive

correlation with nematode parasite infection. However, we did not find support for a significant correlation of fGCM concentrations with strongylid FECs, agreeing with literature suggesting nematode parasites more rarely correlate with GCs than other types of parasites[9]. Interestingly, the effect of being with a non-natal core group was weaker in the model including FECs than in the model including all samples with no FECs. This may have simply been due to a lower overall sample size, but Parker *et al.* (2020) found that non-natal orphans have lower FECs, therefore including FECs might have drawn from variation due to non-natality if some of that variation was associated with lower strongylid infection.

Finally, years an orphan spent without her mother did not significantly correlate with fGCM concentrations, with a slightly positive estimated effect. As discussed in the main text, we would likely have to sample from orphans a shorter time after their mother's death to understand whether there are initial increases and how that may change over time.

Supplemental References

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