

Monkey study reveals why middle managers suffer the most stress

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Barbary macaques. Credit: Wikipedia/Flickr/Karyn Sig

(Phys.org) —A study by the universities of Manchester and Liverpool observing monkeys has found that those in the middle hierarchy suffer the most social stress. Their work suggests that the source of this stress is social conflict and may help explain studies in humans that have found

that middle managers suffer the most stress at work.

Katie Edwards from Liverpool's Institute of [Integrative Biology](#) spent nearly 600 hours watching female Barbary macaques at Trentham Monkey Forest in Staffordshire. Her research involved monitoring a single female over one day, recording all incidences of [social behaviour](#). These included agonistic behaviour like threats, chases and slaps, submissive behaviour like displacing, screaming, grimacing and hind-quarter presentation and affiliative behaviour such as teeth chatter, embracing and grooming.

The following day faecal samples from the same female were collected and analysed for [levels of stress](#) hormones at Chester Zoo's wildlife endocrinology laboratory.

Katie explains what she found: "Not unsurprisingly we recorded the highest level of stress hormones on the days following agonistic behaviour. However, we didn't find a link between lower [stress hormone levels](#) and affiliative behaviour such as grooming."

She continues: "Unlike previous studies that follow a group over a period of time and look at average behaviours and hormone levels, this study allowed us to link the observed behaviour of specific monkeys with their individual hormone samples from the period when they were displaying that behaviour."

Another key aspect of the research was noting where the observed monkey ranked in the [social hierarchy](#) of the group. The researchers found that monkeys from the middle order had the highest recorded levels of [stress](#) hormones.

Dr Susanne Shultz, a Royal Society University Research Fellow in the Faculty of Life Sciences at The University of Manchester oversaw the

study: "What we found was that monkeys in the middle of the hierarchy are involved with conflict from those below them as well as from above, whereas those in the bottom of the hierarchy distance themselves from conflict. The middle ranking macaques are more likely to challenge, and be challenged by, those higher on the social ladder."

Katie says the results could also be applied to human behaviour: "It's possible to apply these findings to other social species too, including human hierarchies. People working in middle management might have higher levels of [stress hormones](#) compared to their boss at the top or the workers they manage. These ambitious mid-ranking people may want to access the higher-ranking lifestyle which could mean facing more challenges, whilst also having to maintain their authority over lower-ranking workers."

The research findings have been published in the journal *General and Comparative Endocrinology*.

Talking about the research, Susan Wiper the Director of Trentham Monkey Forest, said: "Katie has conducted a thorough study with very interesting results based on the natural groupings and environment that the Barbary macaques live in here. We are always pleased when more data is found on this fascinating endangered species of non-human primate."

Katie is currently based at Chester Zoo where she is studying hormone levels in relation to behaviour in a bid to encourage Black Rhinos to reproduce more frequently.

More information: The paper "Associations between social behaviour and adrenal activity in female Barbary macaques: consequences of study design" has been published online in the journal *General and Comparative Endocrinology*.

Provided by University of Manchester

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