



Interactions among social monitoring, anti-predator vigilance and group size in eastern grey kangaroos

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Group size is known to affect both the amount of time that prey animals spend in vigilance and the degree to which the vigilance of group members is synchronized. However, the variation in group-size effects reported in the literature is not yet understood. Prey animals exhibit vigilance both to protect themselves against predators and to monitor other group members, and both forms of vigilance presumably influence group-size effects on vigilance. However, our understanding of the patterns of individual investment underlying the time sharing between anti-predator and social vigilance is still limited. We studied patterns of variation in individual vigilance and the synchronization of vigilance with group size in a wild population of eastern grey kangaroos (*Macropus giganteus*) subject to predation, in particular focusing on peripheral females because we expected that they would exhibit both social and anti-predator vigilance. There was no global effect of group size on individual vigilance. The lack of group-size effect was the result of two compensating effects. The proportion of time individuals spent looking at other group members increased, whereas the proportion of time they spent scanning the environment decreased with group size; as a result, overall vigilance levels did not change with group size. Moreover, a degree of synchrony of vigilance occurred within groups and that degree increased with the proportion of vigilance time peripheral females spent in anti-predator vigilance. Our results highlight the crucial roles of both social and anti-predator components of vigilance in the understanding of the relationship between group size and vigilance, as well as in the synchronization of vigilance among group members.

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