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Title:	Leader- follower dynamics of wild blackbuck herds in response to a predation - like perturbation
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Abstract:	We aim to study the collective escape dynamics of blackbuck (Antilope cervicapra) under simulated predatory threat in the wild, with a focus on initiation and influential indi- viduals (or leaders). We see that this escape dynamics exhibits four phases: an unperturbed initial phase, escape phase, collected movement phase followed by a final relaxation phase. In the escape phase, when the herd is exposed to a simulated predatory threat of a human walking toward the herd, the herd undergoes an escape response after initiation by a few individuals. The onset of escape in all individuals is followed by a collective movement phase where the group tends to move in a more polarized fashion. This phase is also char- acterized by the emergence of leader-follower dynamics between the group members. I worked with 28 videos shot by aerial drones in the field in 2017, and the trajectory data of individuals obtained as the output of their video-tracking. Each video consists of a dif- ferent group undergoing this response. Previously, 10 of these videos had been analysed for group properties and leaders, initiators, solitary individuals and their traits had been identified. Based on the findings of the 10 videos, I focused on finding the emergence of leaders, initiators and solitary individuals for all the 28 videos, including a re-analysis of the previous 10 videos. Therefore, in this context of collective escape dynamics, we aim to understand what factors such as age-sex categories, the position of the individuals with respect to the group and the predator, influence the emergence of some individuals as initiators, leaders (influential individuals) or solitary, uncorrelated individuals. Therefore, we hope to understand how heterogeneity in the group, access to visual cues, and the balance between social and pri- vate information shape the patterns that we observe. We found that leader-follower networks do emerge in the escape phase. The age/sex phe- notypes seem to have no influence on the emergence of the response behaviours. Initiators are least likely to be from the far end of the group, with respect to its distance from the approaching predator. We conclude that initiation of motion is therefore based on access to visual cues. Solitary individuals on the other hand tended to be from this far region, and were restricted to the back and mid regions of the moving group. This tells us that these solitary, uncorrelated individuals are likely naive and join the group asynchronously. We also found that the most influential individuals were more likely to be in the back, exerting their influence through a "push". This study, along with the work previously done with the data sets is one of the first of its kind. It deals with more than 20 groups in the wild. These groups vary in size and com- position. The videos capture most individuals of the group, which have been continuously tracked for several minutes. Therefore, the findings of the study are in a way, novel and focus on leadership of blackbuck groups in a way that has been done before. Since the data comprises of what we think is a representative sample, we hope that studies in the future build on our results in a similar manner to uncover more interesting details about collective leadership in the wild.

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