

Leader-follower dynamics during the group movements in free ranging *Macaca sinica* in the North Central dry zone of Sri Lanka

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In animal social groups it is unclear why certain individuals have a disproportionate influence on group activities. Heterogeneity in within-group social interactions may result in some having more numerous and stronger relationships than others. In this study, we applied Social Network Analysis (SNA) to explore how affiliation and agonistic social interactions among individuals influences leader-follower dynamics in free ranging Toque macaques (*Macaca sinica*) when faced with the decision of moving after bouts of rest. Scan sampling was used to collect behavioural data from a free ranging group of macaques (N = 42) from June – August 2014, in the vicinity of Mihintale Sanctuary. An initiation was defined as the departure of an individual that walked more than 4m in less than 60 s. Followers were individuals that walked for more than 4 m in a direction forming an angle of less than 45° in the direction of the initiator within 5 minutes of initiation. USINET 6.528 was used to visualize the social network and compute network statistics. Statistical analyses were carried out using SPSS 23.0 and dominance scores were computed using SOCPROG 2.5. Initiation attempts correlated with mean number of followers. There was no significant difference between initiation attempts between adult males and females. However, mean number of followers for adult males was significantly higher than for females. Additionally, initiation attempts are significantly associated with aggression out degree, affiliation out degree centralities and dominance scores. However, the mean number of followers was not associated with aggression, affiliation out degree centralities and dominance scores. Our study indicated that there was no explicit mechanism determining leader-follower dynamics in *M. sinica*. The relationship between initiating attempts and affiliation out degrees and aggression out degrees implied that both affiliation and belligerence played an important role in elevating group membership to the position of initiators.

Keywords: Group movemnt, *Macaca sinica*, Social networks