

The SAGE Encyclopedia of Leadership Studies

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LEADERSHIP IN NONHUMAN MAMMALS

The phenomenon of leadership is well studied in humans but also occurs in many nonhuman social mammals, from primates (e.g., chimpanzees, lemurs) to whales (e.g., dolphins, orcas) and carnivores (e.g., lions, spotted hyenas). In many social situations, leaders emerge when one individual or subset of individuals has a disproportional influence on the collective outcome of group decisions. Whereas foundational efforts on leadership in nonhuman species focused simply on individuals (leaders) that moved first and by doing so recruited followers when moving from one area to another, the definition of leadership in nonhuman mammals has been extended to include other domains. Specifically, leaders also emerge in group decisions of nonhuman mammals in the contexts of group foraging (hunting), resolving intragroup conflicts, and during intergroup conflicts that are comparable in many respects to aspects of leadership in small-scale human societies. This entry provides a brief history of the biological study of leadership, describes how leadership attributes vary across

contexts, and discusses the insights gained from a comparative framework.

The Nature of Leadership in Nonhuman Animals

Historically, studies of leadership in nonhuman animals have focused on flocks of birds, herds of ungulates, schools of fish, and swarms of insects moving from one place to another. These studies have revealed that although one individual (the leader) often moves first and thus recruits followers, simple rules (e.g., following the individuals in front, avoiding bumping into them, and maintaining a similar speed) explain seemingly complex patterns of coordinated group movements. Moreover, these patterns of leadership are highly distributed such that multiple individuals within the group may occupy the role of leader, a finding that differs from what is seen in many large-scale human societies. In contrast, in human societies, there is often one centralized leader (e.g., the president, the CEO, the priest) such that decisions are made at the top (e.g., in a head office) and distributed down the chain of command. Interestingly, seemingly complex collective movements (e.g., group travel) in nonhuman mammals from baboon troops to spotted hyenas often emerge with very little communication and are highly flexible with respect to who occupies leadership roles. More recently, biologists have recognized that nonhuman mammals also exert influence on collective decisions within the domains of group foraging (hunting), intragroup conflict resolution, and intergroup conflicts in addition to group travel. Each of these four domains of leadership in nonhuman mammals is discussed below.

Leadership During Group Movements

For many social mammals, group travel represents a consensus decision whereby individuals, often with conflicting interests, must collectively decide when and where to go. In some species with more fluid social structures (e.g., fission–fusion societies), some individuals or small groups of individuals may temporarily fission (break away from the group) and then fusion (rejoin groupmates) at a later time. Regardless of the group structure,

collective movements in mammals occur when two or more individuals maintain spatial proximity while traveling together to a new location, and leaders may influence these (sub)group decisions. We now know a great deal about the collective movements in nonhumans. All available evidence to date suggests that even the most socially complex mammals follow simple rules when navigating from one location to another. Individuals that move first (i.e., leaders) are often those with the greatest needs (e.g., lactating females) or have the greatest knowledge (e.g., elders) about a migratory route or refuge. Followers often follow leaders in the absence of active coercion or signaling on the part of the leader. Instead, followers often follow individuals to maintain group cohesion and often benefit from following these informed leaders to resources or away from danger. For most nonhuman mammals, leadership is distributed among members of the group. That is, rather than relying upon a single centralized leader or leadership team, who emerges as the leader within a given collective movement event for nonhuman mammals is often based upon attributes such as physiological state (e.g., hunger, thirst, reproductive status), sex, and age class. In the context of collective movements, nonhuman mammalian leaders are typically adult females, especially those who are lactating or elders in the group.

Leadership During Group Foraging

Leaders in several species, particularly those who hunt collectively, emerge not only when individuals move from one area to another but also must cooperatively gather to locate, capture, and distribute food within groups. Such processes have been well documented in certain mammals, particularly among social carnivores (e.g., members of the mammalian Order Carnivora). For example, African lions and spotted hyenas often work together to capture live prey that would otherwise be unavailable to a lone hunter, although these two species differ in how leaders emerge and how resources are shared after they are acquired. Importantly, leadership during foraging refers to influence in the decision-making hierarchy (e.g., what to hunt, when to hunt, and

roles, if any, during hunting), whereas *dominance* refers to priority of access to resources once they are acquired. Whereas lions often assume particular roles (e.g., chasers, drivers) when hunting, spotted hyenas rarely do so. Moreover, lions are egalitarian and share food equally once it is acquired. In contrast, dominance relationships among spotted hyenas quickly influence who gains access to kills after they are acquired collectively. More broadly, to the extent it has been investigated, older mammals often lead members of their group to food, presumably because they are more knowledgeable about local resources. Leadership by menopausal killer whales (post-reproductive grandmothers) represents one of the best-documented examples of mammalian leadership in the foraging domain. In orca groups, elder females recruit followers, helping uninformed individuals to locate salmon. This leadership is especially important during times of food scarcity and has profound fitness consequences for individuals, particularly for the young, who often lack the skill or knowledge to acquire or locate food on their own.

Leadership During Intragroup and Intergroup Conflicts

Conflicts within (intra-) and among (inter-) groups can strongly influence the fitness of nonhuman mammals. These dangerous encounters can lead to injury or even death. Conflict resolution within groups can also promote group cohesion and efficiency. Intergroup conflicts are particularly dangerous given that they often involve multiple individuals joining forces to settle disputes over territories and access to key resources within them (e.g., mates, food). When it comes to leadership during conflicts, leadership roles are less shared, and leaders exert more power (influence) in nonhuman mammals than those of small-scale human societies. With respect to sex differences in nonhuman mammals, adult males generally intervene in intragroup conflicts involving other adult males, whereas adult females typically do so on behalf of their juvenile offspring or other adult females. During intergroup encounters, however, males participate more often than females across mammals despite some notable exceptions.

Conclusion

Taken together, leaders influence group-level decisions in mammalian societies in a variety of ways that have important fitness consequences. That is, leaders influence group decisions (e.g., timing, direction, and intensity of collective action) from simply moving and foraging to large-scale conflicts. These contexts are also important for human societies, but leadership in nonhuman mammals is often decentralized and often much more fluid (e.g., who leads is context-specific) for nonhuman mammals. The attributes that contribute to leadership emergence in nonhuman mammals often vary in response to context-dependent interests and knowledge. For instance, the typical pattern across mammals is for adult females to emerge as knowledgeable “guides” during collective movements and adult males to lead as “warriors” during intergroup conflict. Moreover, leaders typically emerge via patterns that closely mirror prestige in human societies—moving first rather than via coercion or force. Understanding leadership within a comparative context can offer new insights into the deep evolutionary roots of leadership, inform our understanding of its general principles, and inform decisions to promote equity in access to leadership positions in human societies.

Jennifer E. Smith

See also Coalitions; Collective Action; Cooperation; Dominance and Prestige, Leader–Follower Relationships

Further Readings

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LEADERSHIP IN SCIENCE

The modern scientific research environment is organizationally and economically complex, embodying a tension between the different leadership paradigms demanded by heterogeneous measures of success. Scientific leadership is no longer defined in terms of 19th-century “great man” theory, characterized by the accomplishments, and therefore influence, of singularly and innately exceptional individuals. Even as the 20th century dawned, that view, perhaps blind to the structural advantages enjoyed by early leading lights, was giving way to trait theory, which placed greater emphasis upon traits acquired through rigorous training and practice. Since the 1980s, when modern leadership theories began to explore the more interdependent interactions between leaders, situations and systems as a whole, including the latent leadership capacities of followers, both transactional and transformational models have held sway within the broader context of increasing globalization and an acceleration of technological innovation.

The approach perhaps most suited to the responsibilities of today’s leaders, when science is more interdisciplinary than ever, is to examine their role through the framework of *action-centered leadership*, the three key components of