

Group hunting within the Carnivora: physiological, cognitive and environmental influences on strategy and cooperation

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Online Resource 2: Examples of studies reporting cooperative hunting behaviour for all species of carnivore for which such accounts could be found. The behaviour in these studies is classified according to the level of organisation of the hunt. Where many examples of cooperative hunting were available for a species, examples were selected to show a range of levels of hunt organisation including the highest level demonstrated. Species are in order of phylogenetic relatedness (Bininda-Emonds et al. 1999), with families separated by dark lines.

Reference	Behaviour- in format: Level of cooperation/ part of hunt: brief description of hunt (Location/Prey)
Canadian Otter (<i>Lontra canadensis</i>)	
(Sheldon and Toll 1964)	Synchrony- coordination/ Chase: Otters swim parallel to drive fish in to the shallows where they can be caught more easily (Massachusetts/ Fish)
Amazon Giant Otter (<i>Pteronura braziliensis</i>)	
(Herskovitz 1969; Carter and Rosas 1997)	Synchrony- coordination/ Chase: Otters swim parallel to drive fish in to the shallows where they can be caught more easily (Neotropics/ Fish)
(Brecht-Munn and Munn 1988)	Inconclusive/ Aquatic-terrestrial: Group advantage for handling larger prey (Amazon/ Anacondas and Black Caimans)
Arctic Wolf (<i>Canis lupus arctos</i>)	
(Mech 2007)	Coordination/ Open approach: Pack split and approached prey from two different directions. (Ellesmere Island, Canada /Muskox) Collaboration/ Chase- ambush: some individuals laid in wait to ambush, while others tried to drive prey towards them (Ellesmere Island, Canada /Muskox)
Mech 1995	Collaboration/ Chase- ambush: Yearlings chased arctic hares towards adults waiting to ambush. (Ellesmere Island, Canada/ Arctic hare)
(Mech 1970)	Possible Collaboration/ Encounter: When hunting young animals some group members will distract the mother whilst others kill the calf. (Canada/Moose calves)
Tibetan wolf (<i>Canis lupus chanco</i>)	
(Feh et al. 1994; Feh et al. 2001)	Inconclusive/ Unknown: Wolves described as hunting cooperatively (Mongolia/ Mongolian wild ass)
Indian Wolf (<i>Canis lupus pallipes</i>)	
(Sterndale 1884)	Collaboration/ Chase-ambush: Part of the pack will chase prey towards pack members lying in ambush. Where cover for ambush is absent they are reported to dig scrapes to hide in. (India/ Antelope and Gazelle)
Domestic Dog (<i>Canis lupus familiaris</i>)	
(Shubkina et al. 2010)	Synchrony-Coordination/ Chase: Individuals alter their speed or direction of movement in response to other group members. Dogs may choose to move in a direction that improves the route of the chase for other dogs. (Russia/ Brown hare)
Red Wolf (<i>Canis rufus</i>)	
(Kelly et al. 2004)	Inconclusive: Reported to hunt in packs. Details unpublished. (Southeast USA)
Coyote (<i>Canis latrans</i>)	
(Bowyer 1987)	Collaboration/ Chase- ambush: During the chase one coyote may flank and drive deer into the path of other hidden coyotes. Observed on multiple occasions. (San Diego Country, California, USA/ Mule deer).
(Muntz and Patterson 2004)	Coordination-Collaboration/ Chase: One individual repeatedly cuts off a deer's escape route and drives it into the path of another coyote. (Kejimikujik National Park, Nova Scotia, Canada/ White-tailed deer)

Ethiopian Wolf (<i>Canis simensis</i>)	
(Sillerozubiri and Gottelli 1995)	Inconclusive: Described as simultaneous pack hunters. (Bale Mountains National Park, Ethiopia/ Reed buck, Mountain nyala, Sheep)
Golden Jackal (<i>Canis aureus</i>)	
(Eisenberg and Lockhart 1972)	Collaboration/ Chase- ambush: One jackal detached from the group and the remaining individuals hid in the forest edge. The individual herds a lapwing towards the hidden group who attempt to catch it when it gets close. The jackals rejoined as a group and another individual then broke away and the process was repeated. Similar behaviour was observed for Jackal hunting Axis fawns. (Wilpattu National Park, Ceylon/ Lapwing and Axis deer).
(Stanford 1989)	Synchrony-Coordination/ Open approach: Two jackals approached the prey from different directions at the same time. A group of three jackals approached prey from same direction at the same time. (Madhupur National Park, Bangladesh/ Capped langurs)
(Lamprecht 1978)	Possible Collaboration/ Encounter: When hunting young animals some group members will distract the mother whilst others kill the calf. (Serengeti National Park/ Gazelle fawns)
Black-backed Jackal (<i>Canis mesomelas</i>)	
(Krofel 2008)	Similarity-Synchrony/ Chase- Kill: One and later six jackals attacked and killed a springbok. (Etosha National Park in Namibia/ Springbok).
(Kaunda 1998)	Possible Collaboration/ Encounter: When hunting young animals some group members will distract the mother whilst others kill the calf. (Ngorongoro crater/ Wildebeest calves)
Dhole (<i>Cuon alpinus</i>)	
(Venkataraman et al. 1995)	Inconclusive-Synchrony-Collaboration/ Chase: Pack members may be positioned to restrict prey's movements or block escape routes. (Mudumalai Sanctuary, India/ Axis deer)
Painted dogs (<i>Lycaon pictus</i>)	
(Estes and Goddard 1967)	Synchrony/ Chase: A leader chased a target prey animal. Other pack members adjusted their speed to maintain a distance of at least 100 yds behind and ignored all other prey animals. They occasionally cut corners in order to intercept prey if it changed direction. Multiple observations. (Tanzania/ Various)
(Fanshawe and Fitzgibbon 1993)	Possible Collaboration/ Encounter: When hunting young animals some group members will distract the mother whilst others kill the calf. (Ngorongoro crater/ Wildebeest calves)
(Creel and Creel 1995)	Coordination/ Open approach- Encounter: Dogs approached a herd of prey that had formed a defensive formation. The pack then split to encircle the herd before simultaneously attacking from different directions. (Selous Game Reserve, Tanzania/ Various)
Bush dog (<i>Speothos venaticus</i>)	
(Cabrera and Yepes 1940; de Mello Beisiegel and Zuercher 2005)	Collaboration/ Chase- ambush: When hunting paca (a species of rodent that often feeds on land but takes refuge in water) the pack split and one half waited in the water nearby, while the other half chased the paca towards them. (South America/ Paca)
Spotted Hyena (<i>Crocuta crocuta</i>)	
(Schaller 1972; Holekamp et al. 1997)	Inconclusive (Simultaneous action -Synchrony)/ Chase: Hyenas simply chase their prey and groups hunt larger prey than do individuals. (Masi Mara Kenya and Serengeti National Park Tanzania/ Various)
(Kruuk 1972)	Possible Collaboration/ Encounter: When hunting young animals some group members will distract the mother whilst others kill the calf. (Ngorongoro crater/ Wildebeest calves)
Lion (<i>Panthera leo</i>)	
(Stander 1992b; Schaller 1972)	Simultaneous action- synchrony/ Concealed approach, chase, encounter: Lions approach prey directly with little sign of coordination among individuals. (Etosha National Park, Namibia/ Various)
(Schaller 1972)	Coordination/ Search: When searching for and on encountering prey, lions spread out on a broad front with curved edges such that prey are scared in to the path of other lions. Alternatively a pride may encircle a herd of prey and approach from different directions at the same time. (Serengeti National Park Tanzania/ Various).
(Schaller 1972; Stander 1992a, b)	Collaboration/ Concealed approach, chase- ambush: The lions split as they approach prey so that each individual approaches from a different direction. Some individuals then stop and lie in ambush whilst those that are the far side of the prey chase the prey towards them.
Canadian Lynx (<i>Lynx Canadensis</i>)	
(Barash 1971)	Collaboration/ Concealed approach, chase- ambush: Three Lynx approach prey, they split, two move to below the prey and hide while the third moves around to above the prey before chasing them down slope towards the other two lynx. One of the ambushers catches a squirrel and shares it with the others. (North America/ Columbian ground squirrel)
(O'Donoghue et al. 1998)	Inconclusive: Lynx hunted in groups of 1-5. (Southwest Yukon Territory, Canada/ Snowshoe hares)

Eurasian Lynx (<i>Lynx lynx</i>)	
(Heptner and Sludskii 1992)	<p>Coordination/ Search: Groups of two or more lynx walk parallel to one another in the same direction such that prey flushed by one can be caught by another. Alternatively two or more lynx may walk towards each other from different directions so that prey flushed by one, can be caught by another. (Eurasia/ various)</p> <p>Collaboration/ Chase-Ambush: One member of a pair may drive prey towards a second lynx hidden in ambush. (Eurasia/ various)</p>
Bobcat (<i>Lynx rufus</i>)	
(Sunsquist and Sunsquist 2002b)	<p>Coordination/ Search: When stalking snowshoe hares a pair of bobcats moved through a plantation about 10 to 15 meters apart and appeared to alternate stopping as the other moved forward 15 to 20 meters. (Unknown/ Snowshoe hare)</p>
(Foldesh 1982)	<p>Inconclusive/ Chase: Two bobcats charged together at a javelina (pig-like animal), one stopped after a few meters about 23m from the prey and the second pulled out of the attack about 5m from the prey shortly afterwards. (Three Bar Wildlife Area, Mazatzal mountains, Arizona/ Javelina)</p>
Cheetah (<i>Acinonyx jubatus</i>)	
(Caro 1994)	<p>Synchrony/ Chase: Male coalitions will simultaneously chase the same prey and (appear to?) try to make contact with it at the same time.</p> <p>Coordination/ Stalk: Males will fan out when approaching a herd and approach prey at the same time from different directions.</p> <p>Possible Collaboration/ Encounter: When hunting young animals some coalition members will distract the mother whilst others kill the calf.</p>
(Stander 1990)	<p>Coordination/ Stalk: Males will fan out when approaching a herd and approach prey at the same time from different directions. During all hunts males watched both the prey and each other. (Etosh National Park, Namibia/ various).</p>
Malagasy Fossa (<i>Cryptoprocta ferox</i>)	
(Luehrs and Dammhahn 2010)	<p>Simultaneous action-Coordination/ Cursorial-Arboreal: Three fossas chased a focal sifaka and shared the kill. Two fossas climbed separate trees while one followed on the ground, however it is unclear whether they were taking account of each others' positions or simply responding to the behaviour of the prey. (Kirindy Forest/CFPF, Madagascar/ Sifaka)</p>