

Social Factors in Captive Wolf Aggression

A Research Proposal

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(Also available at: http://www.anniebwhite.com/Wolf_Content/wolf_information/Thesis.pdf).

Abstract

There are over 500,000 wolves and wolf-dog hybrids kept as exotic pets in the United States today (Hope 1994). While these animals are docile as pups, they become more territorial and dominant at maturity. Due to the changes in their behavior, most do not survive their first year, and those that do end up going to refuges. The intraspecific aggression within the packs formed at the refuges is approximately four times higher than wild wolf packs (White 2001). The results of a previous study indicate that factors in social relationships between pack members play more important roles in mediating aggression levels than do environmental factors (White 2001). I propose a research project that will explore the social causes of high intraspecific aggression in captive wolves. Thirty-four wolves and hybrids in 14 different packs at Mission:Wolf will be observed from April 2002 to April 2003. Through observing the frequencies of bites, pins, chases and growls, the research will establish a level of aggression for each wolf pack. Then, this level will be compared to measures of average age, age variation, pack stability, hybridization and relatedness. The significance of regressions between each social factor and the aggression level of the captive packs will suggest a hierarchy of the importance of these factors and will lead to guidelines for pack make-up of individual wolves and hybrids at refuges, zoos, and in reintroduction and captive breeding efforts.

Introduction

Due to an ever-increasing demand for wolves (*Canis lupus*) as pets, the captive wolf and wolf-dog hybrid population is exploding. While less than 4,000 wild wolves remained in the lower 48 states, there were an estimated 500,000 wolves and hybrids living as pets in private homes in the US (Hope 1994). With the popularity of the wolf at an all time high, there is an ever-increasing demand for wolves as pets; every year, over 250,000 new pups are sold to Americans (Gibson 1996).

As a consequence of their wolf-like characteristics, for which they were originally purchased, pet wolves and hybrids are very often left without a suitable home. As pups, nearly all wolves and hybrids behave much like docile dogs, readily playful and relatively submissive. However, as they grow and approach sexual maturity, most become more predatory, wide-ranging, highly territorial and pack-oriented animals (Hope 1994; Klinghammer 1987; Rabb 1967). Seventy five percent of these pups do not survive their first year owing to human abuse, neglect and misunderstanding. It is common for a wolf or hybrid to accidentally injure their owner during play or when food is involved. The unpredictable nature of wolves and hybrids leads to nearly all of the surviving pets ending up homeless within three years (Gibson 1996).

In response to the problems facing these homeless wolves, refuges have opened to take in and care for them. The people who run the refuges have dedicated themselves to preserving the health and wellbeing of as many of these animals as possible. This requires detailed knowledge of wolf behavior in order to provide for their physical and psychological needs. Observations of and research into wolf social organization, particularly levels of aggression, are important in providing the caretakers with information to ensure the

wolves and hybrids' health and the safety of visitors. The proposed research project will expand on the basic knowledge of wolf and hybrid social structure in order to determine the role of several social factors in mitigating aggression.

Literature Review

A previous study examined the effects of territory availability and pack size on captive wolf and hybrid aggression. The results indicate that enclosure size plays only a minor role in intraspecific aggression, while pack size has a strong, positive correlation to aggression level (White 2001). These findings point toward the importance of social factors and relationships in the mediation of aggression. Researchers have hypothesized that certain social factors – relatedness, pack stability, average age, age range and hybridization – may play a significant role in determining the nature of intra-pack relationships.

The strict hierarchy enforced by intraspecific aggression found in captive packs has been associated with a difference in social bonds between related, unrelated and hybridized wolves (Fox 1972; Frank and Frank 1982; Klinghammer 1987; Mech 1999; Rabb et al. 1967; Schenkel 1967; Zimen 1975). Since refuges do not normally obtain the failed pet wolves and hybrids until 1 or 2 years of age, unrelated and relatively unsocialized packs are created. Without the family structure of the basic wild wolf pack to enforce dominance, the wolves and hybrids are left to aggressive behaviors and displays to implement the hierarchy (Mech 1993, 1999). Similarly, hybridization may affect the hierarchical structure of a pack through the inability of a hybrid to associate successfully with pure wolves (Weber et al. 2001). Typically, a hybrid displays the physical and behavioral characteristics of both the dog and the wolf. Many will bark while howling or begin growling

and biting during play. This unusual behavior may keep hybrids on the fringe of the wolf social structure. The subsequent efforts of the hybrids to assert their dominance within the pack could lead to higher aggression levels.

Due to the late introduction of refuge pack members to each other, individual ages and the overall stability of the packs may effect aggression levels. As with almost any group, there is a period of volatility and unrest following a change in the make-up of the group. Aggression may be used at a lower frequency when reinforcing a stable social order that is already established than (McLeod 1997). Likewise, the average age or its variation of a pack may effect aggression levels. As wolves and hybrids age, more and more of their energy is necessary to overcome the hindrance of arthritis and cancer (Weber et al. 2001). If the wolves and hybrids are close in age, they will mature through the different developmental stages of their lives together. However, if one is much older than another, they may come into conflict as each moves from one stage to another (Fentress 1967; McLeod 1997).

Though there has been much speculation on the effects of relatedness, hybridization, pack stability, average age and age variation on the relationships between pack members, there has been very little actual research done. I propose a research project that explores roles of these social factors in the high intraspecific aggression in captive wolves. Through observational studies of specific behavioral frequencies, the research will establish a level of aggression for each pack. Then, this level will be compared to measures of average age, age range, pack stability, hybridization and relatedness.

The goals of studying the significance of different social factors in determining intraspecific aggression levels in captive wolves are multidimensional: (1) assess the roles of average age, age variation, pack

stability, hybridization and relatedness in mediating aggression; (2) broaden the sample size of wolf packs observed in previous research; (3) examine the role of social factors in the complexity of intra-pack relationships; and (4) establish guidelines for each of the measured variables for use in captive wolf facilities.

Methods

Locations

The study will take place at Mission:Wolf, a sanctuary in the Wet and Sangre de Cristo mountain ranges of Southern Colorado (9,200 ft. elevation). Mission:Wolf provides for 37 captive born timber wolves and wolf-dog hybrids. The wolves and hybrids have been divided into 14 separate packs in enclosures that vary in size from 0.50 acres up to 13 acres. This sanctuary is set up as a non-profit agency staffed by the founder, Kent Weber, his family, and regular volunteers who live in close contact with the canids.

The Canids

Thirty-five captive wolves and hybrids will be observed at Mission:Wolf for the study. Since two of the Mission:Wolf residents live by themselves they will not be included in the study. Starting in 1993 all of the males were given vasectomies in order to prevent unwanted litters, while leaving their hormonal levels and natural behaviors intact. As each individual arrived at the refuge, they were either given a name or kept the name from their previous owners. For simplicity's sake, each wolf or hybrid will be referred to by name for the duration of the study. Their ages range from 6 to 14 years old. Of the 35 animals to be observed, 14 are female and 21 are male. The 35 canids are divided into 14 packs, varying from 2 to 5 individuals.

Behavioral Descriptions

The designation of types of aggressive behaviors that will be studied was conducted at Mission:Wolf on the captive wolves and hybrids during a previous study (White 2001). The formally developed ethogram is shown below:

Table 1. Ethogram of measured aggressive behaviors

Bite	close jaws and teeth on another, may or may not wound
Growl	a throaty rumbling vocalization usually of low pitch
Chase	running pursuit with frightened and submissive behaviors during or after, by the chased wolf
Pin	lunge and bite at the neck, muzzle, or body of another wolf , forcing it to the ground and holding it there

One second of growling or chasing will be counted as one unit of behavior, in order to quantify the behavior's intensity. One-second intervals are appropriate for this study because of the moderately consistent low numbers of aggressive behaviors initially observed. Only the frequency of biting and pinning will be recorded because these behaviors are not dependent on duration for their force.

Observational Techniques

The data will be collected on randomly determined days. Observations will be restricted to the early morning (5:00 to 8:00 a.m.) and early evening (5:00 to 7:00 p.m.) in order to observe the wolves when they are most active.

I will use a focal behavioral sampling method because distinct variables, separate packs, and one particular category of behavior will be

studied. Observations will focus on all of the behaviors of one pack of wolves for a specific time interval. The open terrain in and around the enclosures at Mission:Wolf allows for consistent viewing of all members of a pack. Due to the high visibility of the wolves and hybrids, aggressive behaviors of every individual in the pack will be continuously recorded. During this phase of the study, two research assistants and I will observe packs for one-hour intervals and record any aggressive behaviors. The person watching a particular pack for each hour will be rotated, so as to minimize observer bias. To control the potential effect of human presence on a pack's behavior, no one pack will be given more acclimation time to the observer than the others.

Data recording will stop during particular instances that might affect the canids' behavior, as all 14 packs can not be monitored simultaneously. For instance, behaviors will not be recorded directly before, during, or after feeding, because competition for food greatly increases tension between packmates, exponentially affecting aggressive behavior rates. Whenever a visitor approaches one of the enclosures the wolves and hybrids will usually either shy away from the person and each other, or they will confront the intruder. Therefore, we will stop observations when visitors are present. Finally, observations need to pause whenever the staff is particularly active because the wolves and hybrids become excited.

Statistical Analysis

As was stated previously, one second of growling or chasing will count as one unit of behavior and each pin and bite will be counted separately. The occurrence of each behavior and the total aggressive behaviors for each pack will be divided by the number of hours each is watched, thus coming up with values for "aggressive behaviors per hour." These values will then be divided

by the number of wolves in each pack to create a non-biased measure of aggression level: “aggressive behaviors per hour per wolf.”

These levels will then be regressed with each of the social variables. Average age of the wolf pack will be established through known or suspected ages of individual wolves in the pack. Age variation is the range over which individual ages fall. To assess pack stability, I will trace the amount of time, in months, that the particular individuals in a pack have lived together. Relatedness and hybridization will be determined through pedigree analysis. For each pack, relatedness will be measured on a scale: siblings=5; parent/offspring=4; grandparent/grandchild=3; aunt or uncle/niece or nephew=2; cousins=1. Then the total value for the packs will be divided by the number of individuals in each to standardize the measure. Hybridization will be determined as sum of percentage of dog for each individual within a pack. As before, these values will be divided by the number of wolves in each pack. The regression analyses will be run between these variables and aggression level for each pack, with Sig. $F < 0.5$.

Discussion

This study will serve to provide valuable information about wolf pack social structure to refuges as well as researchers in the field. Through comparing each measured social factor – average age, age range, pack stability, hybridization and relatedness – to the “aggressive behaviors per hour per wolf,” the significance of these relationships can be determined. Then, by comparing the significance of these relationships as well as the level of correlation between the social factors and aggression level, an order of importance in the social factors may be established. Through examining the roles of average age, age range, pack stability, hybridization and relatedness, guidelines may be developed for use in refuges that would hopefully mitigate excessive intra-pack aggression. Likewise, the results could give noteworthy

insight into the different roles that these factors play in the social interactions of captive and wild wolf packs. By understanding this, it may be possible to keep captive wolves healthier, caretakers safer and provide more information on how human can live in close proximity to wild wolves without serious conflict.

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