THE SOCIABILITY OF CATS: HOW THEIR GROUP STRUCTURE AFFECTS OUR LIVES

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INTRODUCTION

Domestic cats live in diverse social groups in which the make up depends largely on the availability of food and shelter.1-2 Cats thrive in both urban and rural situations using completely different social systems including the density tolerated, sexual strategies used, and the disbursement mechanism used.3 Both these populations of cats are based on related females and males that may or may not have emigrated from another group.4 All cats, no matter what type of group they live in, are aggressive towards outsiders.4,5 Cats also prosper in the home or shelter environment where their density may be intense and many of their natural behaviors are thwarted.

Feral cat populations live in either of two situations. Urban cats live in large groups with densities approaching $972 \pm 55$ (SD) cats $\text{km}^{-2}$.1 This is primarily controlled by access to shelter; food is not generally an issue since these cats eat from the endless supply of garbage and/or from feeding stations filled by people.2 The typical urban cat group is made up of a multi-male multi-female population. Males may not emigrate from the group territory upon sexual or social maturity due to environmental constraints (barriers) or lack of aggression between males.6 Although it is rare in most feline populations, females may leave the area if they can't acquire adequate shelter for their litters.6 Females will show choice in mating preference by rejecting males who are closely related (males who had 1/4 or more relatedness were rejected)7 alternately they may breed with closely related males without any health issues in their kittens,6 at least in the short term. Cats that live at this concentration use a different sexual strategy than rural males; they do not attempt to control access to females and subordinate males are allowed to copulate.8 The males are able to mate as soon as they are sexually mature (9-12 months) and 80% of the queens in these communities have litters with more than one father.9 Tomcats either spend large amounts of time with females while mating many times or they spend small amounts of time with females and mate less often.10 Both mating strategies appear to be equally successful.8 Although a dominance hierarchy in males is supported by data,8 it does not correlate with breeding success, since males do not guard females in estrus and do not prevent other cats' mating by force.8 Aggression was not found to be a successful tactic because while a male was fighting with a second male to prevent him from breeding a third male could be copulating with the female. Since aggression takes energy, this is not an efficient use of energy for tomcats in urban groups.

Rural cats live in less crowded groups their density being $234 \pm 63$ (SD) cats $\text{km}^{-2}$.1 Their group structure depends on the availability of food, which is provided by humans and/or hunting.4 Male cats that live in these social groups exhibit behavior that closely resembles the behavior of small wild felids in that they use the polygyny (one male mate with many females) mating system.1 Tomcats’ dominance ranks correlate positively with mating success and males do not breed until they are socially mature (approximately 3 years of age).9 Cats in these social groups have large territories that overlap during the mating season.4 Males typically leave the group when they are social mature (1-3 years) due to aggression from other males in the group.11 Females are wide spread clustered in small, primarily kinship, groups.4

Group housing of cats is seen in both shelter situations and in personal homes. These groups have their own distinctions: cats are often not related, are neutered and cannot emigrate. Amazingly enough, cats that live in shelters where they are kept in large groups show few aggressive encounters in respect to total encounter numbers despite the fact that they are not related and are frequently mature adults when they are introduced.12 Factors that affect affiliative behaviors in cats seem to be personality trait based, reflecting "boldness" and "reactivity", which in turn elicit the particular social behavior of the individual cat.13 Personality in cats is formed by a complex web of interacting factors including genetics (paternity of the individual and coat color) and environment (group structure, socialization, complexity of environment and litter size).13 Increased interactions between cats cause an increase in agonistic encounters,15 which in turn can increase unwanted behaviors (spraying, clawing and aggression).15 Family environments are extremely complex, which leads to difficulty in assessing what factors affect specific behaviors.16

Cats and humans when living together and interacting together create a bond.12 The number of interactions is low (on average) but there is huge variability in this and also in the types of interactions shown.15 In general, women have closer relationships with cats, and adults have more interactions with cats than juveniles and children.16 Cats interact in an affiliative manner with people who spend time with them and fulfill their wishes.16 Factors that contribute to a cat's behavior when with people are amount of time the people are at home with them, the number of cats in the home and the number of people living there.16 Having multiple cats living together can be helpful for both the cats and the people since cats can have some of their social needs taken care of by the other cat, especially when owners are away most of the day.16 Special consideration needs to be given to the personalities of the cats to make sure they would enjoy feline company. When introducing a new individual a separate room needs to be set up. The cats need to be kept separate until they habituate to each other. Odor swapping (wiping each cat gently with a soft cloth over the sebaceous glands) can be used to facilitate a group odor, which helps to acclimate the cats to each other. At this time the cats can be put together for meals. In this way they will associate food with the new comer and the new cat will be accepted. This is not possible in some cases as each cat is an individual and some have strong territorial aggression and will not share territory. Using "anthropomorphic selection" humans breed animals for whatever traits (visual or behavioral) they find attractive.3 This process can cause disastrous effects physically and emotionally for animals.3 Both people and animals can benefit from a social relationship between the species although pets may benefit more biologically creating a case of social parasitism.17 People can experience a reduction in stress by using cats as part of their social support structure and cats can benefit from this new ecological niche due to the plentiful food, shelter and social interactions involved.3 Cats and dogs but not humans see an increase in reproductive fitness as a result of the relationship.17 People's expectations of their pets can cause an increase of pressures, evolutionary and behaviorally, that can cause pet welfare issues.3 These expectations can include our tendency to expect our pets to
anticipate our emotional needs simply because they seem to share similar emotions. Conflicting signals from owners can cause animals to perform coping behaviors.\textsuperscript{18}

Social behavior can be changed by modifying the environment or by using behavior modification techniques to change the associations of the individual. Environmental enrichments for indoor house or shelter cats would primarily consist of increasing the quality of the space available.\textsuperscript{19} Creating more three-dimensional space for cats to inhabit, increasing the types of toys offered and making social interactions available for cats according to their needs and wants are all environmental enrichment options. Toy rotation is necessary since cats quickly habituate to toys if they are not rotated. Recent research hints at increased aggression in cats that split their time between indoor and outdoor environments.\textsuperscript{20} The outside environment is dangerous but highly engaging for cats. It is simple to enrich a cat’s environment by letting it explore outside. The challenge for owners is to enrich the indoor environment for exclusively indoor cats. Since cats are regarded as super-sensory beings it is imperative for their mental health that they are able to use these senses each day.\textsuperscript{18} Feeding options for increased enrichment include the addition of food puzzle toys, which can be made from PVC pipes, plastic tubs or bought commercially; hiding dry food about the house is another suggestion.\textsuperscript{19} Although, dry cat food is especially nice for this it is more difficult to manage it if you have indoor dogs. Predatory behaviors can be encouraged by using moving toys (either self propelled or powered by the owner) to promote pounce behaviors in the cat. It is necessary for solitary indoor cats to have 30 pounces per day to fulfill their requirements for hunting behavior.\textsuperscript{18}

Cats have lived with humans throughout time developing a niche in the village by taking advantage of the surplus of food and shelter. This relationship has helped cats in an evolutionary sense, increasing their numbers tremendously. It remains to be seen whether or not it will benefit people and cats in the long run. The pleasure of pet ownership doesn’t discount psychological or physical damage incurred by either animal due to the relationships. Continued work needs to focus on creating a healthy bond that benefits both.

REFERENCES


