Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
2002 Volume VI: Biology and History of Ethnic Violence and Sexual Oppression

Basic Animal Behavior in Domesticated Animals

Curriculum Unit 02.06.01
by Kimberly J. Workinger

Overview

Paramount to effectively working with animals is an understanding of animal behavior. Is the behavior being exhibited “normal” or the result of injury or fear? What visual cues do animals give us to let us know how they are feeling? How do animals communicate with each other and with us? What behaviors ensure their survival? For that matter, what is the difference between instinctive and learned behaviors? How has the observed behavior evolved over time? What are the instinctive behaviors of companion animals? How does the knowledge of the behavior of animals relate to a curriculum in small animal care? Through a series of observations, lectures and applied activities the students of an animal science/veterinary tech class will learn about some of the behaviors typical of dogs and cats as companion animals.

Background Information

I teach at The Sound School Regional Vocational Aquaculture Center in New Haven. The students enrolled at the Sound School are from both the city of New Haven as well as eighteen participating districts in the south central Connecticut area. The student population is diverse including white, African American, Latino, and racially mixed students. The cultural diversity is further enhanced by a wide spectrum of economic means. This is a traditional school in the sense that the core courses are taught on the same campus. The English and history elective courses often have a nautical component. While the name of the school does not indicate as such, there are two vocational learning directions for the students. Students from the city of New Haven can study aquaculture or agriculture.

The agriculture students learn a wide range of vocational skills including the use of power tools, tractor driving, landscaping techniques and in the case of the small animal curriculum, handling and caring for small animals. For safety reasons, the class sizes are controlled by the vocational system and are comparatively small with a maximum of 15 students per class. The small animal curriculum includes handling of animals

including general care, feeding, and breeding of primarily small animals such as hamsters, gerbils, rabbits and chinchilla. As the school expands facilities, the hope is that there will be cats and small dogs at the center. Until that time, the animal science course utilizes local veterinarians and shelters to access these animals.

The course that this unit is designed for is an animal science/veterinary tech course taken in the junior year of the agriculture track at the school. Having studied natural resources and general biology in the freshman and sophomore years, the students have chosen this course to focus their studies in the direction of animal care. While companion animal care does not fall under the normal scope of production agriculture, it is a potential course of study at The Sound School. As potential employees of the huge animal care industry, the broad objectives of the small animal curriculum are understanding of and appreciation and respect for companion animals. In order to become effective participants in the animal care industry, it is important that the students in this class have a reasonable understanding of animal behaviors, the physiological basis of these behaviors and be able to differentiate between a behavior and an instinct. In many cases, an understanding of this information could determine the safety of the animal, the employee and the public that comes in contact with the animal. As an effective employee of the animal care industry, students may also be required to explain behaviors of dogs and cats for the benefit of the clients. Should the student graduate from the Sound School and work in a veterinary office, for example, the client would be better served if he or she had some understanding of animal behavior and could effectively communicate this to the owner. Understanding animal behavior in the context of working with the animal in any one of the occupations that make up the animal care industry is the overall goal of this unit.

My teaching style is generally one of conversation/ discussion where I encourage the students to think about the world around them and how they impact that world. The animal care industry requires people who are observant, committed to the welfare of animals and willing to take on responsibility with attention to details. The student activities provided in this unit will require the students to us observation skills and comment on what they observe both in a written and oral form. Throughout the course, students are asked to understand the information and immediately apply it to the extent that it is possible with out, for now anyway, having animals in the room.

Introduction

The genes are the set of instructions which builds the parts of the body, including the brain. Each species brain is built on a somewhat different pattern. When a happy, a dog may wag it’s tail, a cat purrs and a human smiles while a turtle shows no outward signs at all. These differences are due to the different brain structures inherent to each species. The brain and other parts of the nervous system generate behaviors with a response to environmental input and hormones. Some of the behaviors may be simple immediate responses to simple stimuli including the knee jerk reflex and the cry of pain and grimace when an animal is hurt. There are also automatic responses to more complex situations like the tail wagging and the smiling mentioned above or uncontrolled laughter and giggling. Other behaviors are driven from internal motivations like hunger, thirst, need to sleep, defecate, urinate, sex drive, etc. Some are extremely complex like birds migrating thousands of miles to find winter nesting grounds or human children learning to speak. These behaviors are all intimate interactions between the propensities and capabilities of the brain and the environment in which the individual exists.

The word instinctual refers to the contribution of the brain's structure to a behavior. Eating and sex are clearly instinctual- but an animal cannot eat if there is no food and can't mate if there is no partner available. Bird migration is called an instinct, but its direction is guided by patterns in the stars. The development of human speech is called learning- but every human child can do it without explicit teaching. The brain need to pick up language by hearing others speak.

The different species have evolved behaviors that help it succeed in its own environment. Fish have evolved fins and swimming behaviors and mammals have evolved legs and walking behaviors. Many animals communicate with each other and other animals. Birds have evolved singing, dogs barking, cats meowing and humans speaking. All of these species also communicate using visual cues-coloring of birds, facial expressions in many animals, ear, face and tail position in dogs and the crouching position of cats.

Instinctive and Learned Behaviors

Instinct

What exactly is an instinct? If some behaviors are physical manifestations of instincts, understanding what an instinct is and how they evolved is a good first step to understanding the behavior of animals. An instinct is a behavior that animals exhibit independent of the wide range of learning and experiences of different individuals. Some times referred to as "hard-wiring", instinct is the result of brain physiology. This is supported by Irenaus Eibl-Eibesfeldt who wrote in his book Ethology- the Biology of Behavior that "Innate behavior patterns may already be fully functional at the time of hatching or birth". Often developed during critical periods, instinctual behaviors have evolved over evolutionary time to ensure the survival and reproduction of that species. Other behaviors evolve or are learned and perfected over an individual's life time. The goal is the same, to survive and to reproduce.

Instinctive behaviors have been studied for some time. One such study examined the instinctive behaviors of newborn primates. In the early 1960's a study was done with a baby Rhesus monkey abandoned by its mother shortly after birth. Researchers placed the baby in a room with two "mothers". One of the surrogate mothers was made of wire and had no distinguishing features of a mother except that it had a bottle attached to it containing milk. The second wire mother had a soft blanket and a "face" on it. In a 24-hour span of time, the baby stayed on the soft mother the overwhelming majority of the time even though it had nothing to offer in the way of food. Instinctually, the baby monkey was drawn to the surrogate that could provide the warmth of what it thought was a mother.

Birds offer another example of instinctual behavior. The well known animal behaviorist Konrad Lorenz has been studying animals of all types including the Graylag Goose. Instinctively, the Graylag Goose and birds in general, know that upon hatching, they are looking for their mother. She is a being that is larger than they are within certain parameters and that she provides food. This is where the instinct stops and the learning begins. They learn that the first being they are in contact with who meets these criteria must be the mother. Imprinting occurs at this point. By moving slowly and crouching close to the ground Konrad Lorenz imprinted

the geese on himself by being the first slow moving creature larger than themselves that they encountered. While the imprinting is a phenomenon that is most often seen in the world of birds and not to the companion animals that students of this class will be working with it is associated with instinctive behaviors of reproduction and nurturing.

The instinct part of that scenario seems to end at the “knowing” that the first relatively large being is the mother. The learned part seems to come when the newly hatched chick identifies or learns the exact shape and features of the object it will act towards as a parent. “Imprinting occurs at a critical period in development”. (Goldsmith and Zimmerman) It is important to note that the critical period for all behaviors is not always at birth. Critical development periods occur in most animals and are often rather short periods of time.

Applications to Companion Animals

Many behaviors in the early life of the dog or cat are instinctual. Kneading action of the paws of a puppy or kitten on the mother’s breasts is an instinctual behavior that literally determines the young animal’s survival. This particular behavior stimulates an equally instinctual behavioral response for the mother. This is the lactating response. Hormones are released from the brain thereby releasing the milk from the mammary ducts to the nipples. This lactating response is seen in human beings as well. Calling out to the mother as the young animal’s eyes are still closed and nestling in with the rest of the litter maintaining the body heat of such a small individual. The mother instinctively licking the young keeps the young’s coat clean and aiding in the process of elimination of feces and urine. This licking action is comforting to the young and in the case of the cat elicits the purring response that is characteristic only of the cat. No other animal can make this particular sound. This behavior extends beyond the care of the mother to occur any time the cat is content or being stroked in the same manner by a human. While it would seem that mothering or nurturing behavior is instinctual, it appears that it is not. Very often dogs or cats that become pregnant at a very early age are not at all prepared for what is happening to them. Occasionally, young mothers will abandon or kill the young shortly after they are born. This could be due to incomplete development of the essential brain structures or mammary glands of the mother.

Marking is an instinctive behavior in dogs that has both social and sexual purposes. Pheromones present in the urine giving all who encounter the mark left by others a variety of messages including sexual receptiveness, eating habits, age and overall health. (Overall) It has been proposed in a book entitled “The Secret Life of Dogs” by Elizabeth Thomas that dogs will often nearly stand on their toes to leave their scent as high as possible. She believes that the dog is trying to convey a message that they are bigger. The anal glands of the dog secrete these messages as well. This explains why dogs will sniff at each others hind ends when meeting. Anal gland secretions are also expressed when the dog rubs its anus on the ground or when the dog is particularly stressed.

Cats also exhibit marking behaviors that are instinctual. They have glands on the cheek, the lips, the forehead, the tail, the chin, the pads and the some that are associated with the whiskers. When the cat rubs on people it is more for deposition of a scent to let other cats know that this human belongs to them. It is rather fortunate for the cat that they have these glands for leaving a scent all over the body. It the target is

near the cheek, they rub with the side of the face. If the object of rubbing is higher the glands at the tip of the tail or the back are utilized.

While mounting behaviors appear to be sexual in nature, this is not the case. This instinctual behavior can serve as a direct challenge to another dog's authority or standing in the group as well as a communicatory gesture. When a dog with higher social status mounts a subordinate, the dominant dog is physically above and therefore in control of or superior to the subordinate. This position above the neck allows the superior animal access to the vulnerable jugular vein of the individual that is subordinate. Puppies exhibit this behavior as well. It is during this period of time that social foundations are formed. During play each puppy is assessing who is stronger or has more stamina and determination It may be thought that the mounting behavior is exclusive to the male dogs. This is not the case. Dominant female dogs in a pack will exhibit the same behavior normally to confirm her status to underlings in the pack thereby asserting her control. When a dog mounts a pillow or other inanimate object, the motivation is probably misdirected sexual behavior. When considering if the mounting is sexual in nature, consider whether the dog is in tact, meaning not neutered or spayed, or on heat. If there is no sexual reason, the mounting is an assertion of social rank.

Both dogs and cats exhibit instinctive predatory behaviors. Humans identified this skill in dogs some time ago and have been breeding certain breeds for there specific skills including herding, tracking and speed. We have even bred for certain body shapes like dachshunds and terriers to prey on and hunt certain animals. Cats are perhaps more known for there instinctive predatory behaviors. To the dismay of bird loving cat owners, they will often prey on birds at the feeder or help out with the mole population in the yard. When the cat returns to the home with the prey, this is not a token of appreciation but a maternal instinct to return to the den with food for young whether or not there are young there to feed. Mother cats, if given the opportunity will bring back dead prey for the young to feed on and later bring back live prey to allow the young to practice the inborn instinct to hunt.

Instinctual behaviors are most often associated with wild animals. An understanding of instinctual behaviors will be achieved through a series of video clips and observations of animals in shelters and at home. After discussing the difference between an instinct and a learned behavior, students will be asked to list behaviors observed and comment on whether that behavior was instinctual or learned. Observation is a key skill set for those working in the animal care field. While it is a good start to talk about the different instinctual behaviors, the best assessment of understanding is observing and commenting on the behaviors.

Learned Behaviors

A considerable amount of research has been done with dogs in particular around this notion of critical periods for development. Because dogs generally open their eyes by week 3, the development of social behaviors seems to begin then. Between the ages of 3 and 8 weeks, dogs are learning how to interact with other dogs, principally their litter mates. Between week 5 and 12 dogs are learning how to interact with humans and between 10 and 20 weeks they are learning about novel environments like the veterinary office. "If the dogs are deprived of these periods, they are at risk of developing inappropriate or abnormal behaviors associated with them". (Overall, p. 13)

"Unlike instinctive behaviors, learned behaviors are shaped by experience. Animals would not survive in this

world if they were unable to modify their behavior". (Miller, Levine) Learning, in broad context, is separated into two different types: classical conditioning and operant conditioning. In classical conditioning, an animal learns that a stimulus, like the sound of a can opener, leads to a good or bad event. The stimulus is the can opener and the event is feeding time. Another example would be the jingle of the leash and a walk around the neighborhood. In the wild, the return of the mother wolf to the den signals to her young that a meal is about to be served. Operant conditioning involves trial and error for the animal to learn. The animal learns that certain behaviors will result in a reward or a punishment. Obedience training is often based on this type of learning. If the dog sits when a particular hand motion or word is spoken by the handler then he receives a treat. This is positive reinforcement. Contrast to this, if the dog barks incessantly and you go to him and yell, he learns that barking will get attention even if this in negative attention.

Behaviors, be they aggressive or non-aggressive, are learned over time and are physical manifestations of emotions experienced by the animal. Some of the aggressive behaviors are instinctual while some are learned. Understanding aggressive behaviors and all of the nuances of aggressive behavior is a key skill in the arsenal of a veterinary technician. When handling a domesticated animal whether it is a cat or a dog a veterinary technician is responsible for the safety of every one the room including the animal, the veterinarian, the owner and themselves. There are a number of factors to consider when evaluating aggressive behavior and animal communication. Animals do not have a spoken language with which to communicate. The body language of animals is the language that animal handlers need to understand. The words of this language are posture of the head, back and tail, position of the ears, activity of the tail, raised hairs, activity of the eyes, specifically the iris and the mouth including biting, snapping, nipping and baring teeth. Vocal signals such as growling and barking could also be present.

Aggressive Behaviors

Dominant aggressive dogs are aggressive because they feel that they have the upper hand or are dominant in the pack or, in the case of domesticated animals, in the household. This type of behavior has its origins in the ancestral wolf pack of the modern domesticated dog. In the pack there is generally one dominant dog to which the rest of the pack is submissive. "A wolf pack is a well-organized society of individuals that cooperate in hunting for food, defending their territory, and rearing the young" (Schwartz) The nature of this societal relationship lends itself to the evolutionary development of a wider variety of facial and body signals than is seen in solitary hunters like the fox. The dominant wolf or Alpha Dog is the leader of the pack and has a great deal of responsibility for the well-being of the members of the pack. As such, there is constant challenging of the social positions held by each member. The dominant wolf often pins the subordinate to the ground or places his or her head above the subordinate to express dominance. The subordinate displays body language that is very different. Lowered head and ears, tail tucked between the legs, not making direct eye contact and eating last are behaviors indicative of a subordinate wolf. The same dominant aggressive behaviors exhibited by a member of a wolf pack are displayed by domesticated dogs where there is more than one dog in the household. The dominant dog will control the submissive dog in the household. Dominant dogs carry the head and tail high. The ears are pricked forward and the stance is slightly pitched forward. The dog may wag the tail. A wagging tale is not always a friendly greeting. This is a myth. If the lips are curled up showing any of the teeth, this is an indication of a dominant aggressive dog in an offensive position. When observed and evaluated as a complete package, the dog is confident of its position and ability to assert its dominance.

A single dog in a household generally regards a human family as the equivalent of a pack. Dogs who are dominant aggressive strive to attain a leadership position in the pack by exhibiting a number of behaviors. Quite literally, the dog is aggressive toward the owner in order to assert dominance over the owner. Some of the behaviors indicative of dogs asserting dominance is mounting on humans, paws in the lap of owners, reluctance to assume physical positions of submission like sitting or laying down on command, a sensitivity to being touched on the head or back and direct, unwavering eye contact. The dominant aggressive dog is confident and as such, keeps its head and ears erect while exhibiting these behaviors. Dogs use eye contact as a means of assessing the social position of any animal they encounter including humans and other dogs. The one who breaks the eye contact first is the subordinate. Along this same line, direct eye contact from a handler or owner would be perceived by the dominant aggressive dog as a direct threat to his or her position and may be met by aggressive threatening behavior. Other human activities that could result in aggression from a dominant aggressive dog are reaching over the head, handling the head or muzzle, stepping over or disturbing from a sleep, and leaning on or pushing the head, neck or back. (Overall)

Using visuals created by the students, video clips, field trips to animal shelters and class discussions an understanding of the basic body language of dogs who are dominant aggressive will be discussed. The safety of individuals handling dogs or cats with dominant behaviors would be compromised if a firm understanding of typical aggressive behaviors where not understood. Very often the public comes in contact with animals that are dominant aggressive whether because the owner has taken their dog to the park and it encounters other dogs or because the owner is taking dog for a walk and the dog displays aggressive behaviors to someone else walking on the street. Not only are the students of this class potential employees at a veterinary hospital but they are very often dog owners themselves. An understanding of some of the behaviors of aggressive dogs will help the students to become more responsible pet owners.

Aggressive behavior in animals can be learned. “Once an animal learns that aggression is effective, it is more likely to become aggressive again under similar situations. Aggression is an instinctive response that can become a conditioned response to a given situation. A dog that is rewarded by praise or attention for aggressive barking may soon learn that barking is an effective way to get your attention”. (Schwartz) Recently there have been stories of dogs attacking humans in the news. Often there is supporting evidence that the animal that attacked a human was trained to do so. In the case of police dogs, this training is for public safety. Whether the animal was provoked, trapped, injured or ordered to do harm it is in the interest of the animal industry to be aware of the signs of aggressive animals.

The fight or flight response is any animals survival mode. The autonomic nervous system controls a number of body systems including the respiratory and cardiovascular systems. When the system is activated, the body increases respiratory and heart rates, increases mental alertness and decrease digestive activity so that the blood might be utilized in skeletal muscle tissue for quick movement and defense. The fight response occurs when the animal turns to take on the aggressor. The flight response occurs when the animal flees from and escapes the aggressor.

Where dominant aggression in dogs is similar to the fight portion of the flight or fight response of all animals, including humans, fear aggression is most closely related to the flight portion. A dog that is fear aggressive will become violent or aggressive literally to fight its way out of situation where it feels threatened or out of control. Dogs that were trained as attack dogs are generally fear aggressive dogs. The handler is the only individual the dog trusts. Each time the dog is greeted or approached by a stranger, a shock is administered to the animal. Through this stimulus response technique or classical conditioning, the dog learns that the presence of anyone except the handler is undesirable and becomes aggressive as a fear response. As the

intensity of the fear or even the perception of fear increases so does the aggressive behavior. Without being trained to be fear aggressive there are other factors that could cause an animal to be fear aggressive including limited social interaction with humans and animals during the critical period of development.

The body language associated with fear aggression is similar in cats and dogs. Instead of pricking the ears as was the case in dominant aggression, the ears are laid back and the animal will crouch lower to the ground. Hair standing on end serves to make the animal look larger to the threatening animal. Dilated pupils are another cue from the frightened animal. As a worker in the animal care field, an ability to read these cues and understand them is critical to safety of both the animal and the employee. Fear aggression behaviors could be the result of injury or sickness. Animals who are cornered without an avenue for escape could also exhibit these behaviors attacking the person who is in the path of escape. This is called redirected aggression.

Many of the aggressive behaviors discussed become magnified when a dog or cat is brought into a situation where they may have had prior experience or learned that they should be fearful. The most common and necessary of these places is the veterinarian's office. When all of the components of an office visit are considered from an animal's point of view, it is a threatening environment that will invoke the fear or the dominance/defensive aggression. There are smells from other animals, both well and unwell, unfamiliar surroundings, and in some cases, an association of pain with all of these variables if past visits to the office have resulted in surgical procedures. Another factor that has not been discussed is the ability of the dog or cat to sense that the owner or those around him are fearful, anxious, confident or defensive. The ability of an animal to sense the attitude and demeanor of those around him comes from the animal's ancestral past. The wolf pack origins of the dog used these senses to determine the intentions of each of the members of the pack. If the owner is a member of the dogs pack, then the dog is able to sense the feelings of the owner. Generally speaking, "aggression at the veterinarian's office is caused by fear". (Schwartz) When the owner is not there and the animal is being cared for at the hospital, a continued awareness of the instinctual need of animals to control their environment and the propensity to defend themselves is paramount to being safe on the job.

Learning about and understanding the common animal behavior is inarguably important to the successful handling and care of companion animals. Inattentiveness to the communication or total lack of understanding could be potentially dangerous to both the employee and the animal. If the animal is injured, fearful or happy, it will display a wide range of emotions in its body language. The students who participate in this unit will have a finer understanding of both the animals in there homes and the animals that they might encounter on the job and on the street. Armed with this knowledge, they will be informed and can influence the welfare of animals. The following series of activities teaches the student some body language associated with different "messages" sent by companion animals. Being able to observe the signs and effectively communicate this information to both fellow employees and to customers is critical. The individual who can accurately teach skills to another truly understands those skills.

Classroom Activities for the Animal Behavior Unit

Introductory Lesson: The Autonomic Nervous System

Objective:

Demonstrate that the nervous system and the physiology of the brain are responsible for the autonomic responses, specifically the fight or flight response.

Activity/Demonstration:

Pop a balloon in the room some time during the discussion.

Discussion:

Discuss the path that the information travels and how quickly that path is traveled.

Discuss the physiological responses including increased heart rate, dilated pupils and the release of endorphins that regulate all of these responses.

Describe how an animal might respond to the same stimulus

What are some of the situations that might result in similar responses from a companion animal?

What is a Behavior?

Objective:

Students will leave the class with an understanding the difference between and an instinct and a behavior

Activity: Break the class into groups of 4. Assign a different animal to each of the members of the group. Have the students act out behaviors that they think are typical of that animal. Be sure to indicate that behaviors are not limited to the noises that an animal might make…..the way it moves, gets its food, finds a mate, passes the time. While the “animal” is acting out its behaviors, the other three members of the group are writing down descriptions of the behavior. If a name can be given to the behavior, panting, for example, team members can name the behavior in their observation notes.

Define Instinct vs. learned behaviors

Which of the behaviors you exhibited where instinctual and which were learned behaviors? If the behavior was learned, where did the animal learn that behavior? What purpose does that behavior serve for the animal?

Body Language-Humans

Objective:

At the end of this lesson the student will understand that all animals including humans use body language to communicate a large range of emotions.

Activity:

Define Body Language

Discuss that communication is both spoken and unspoken

Observations the lunch room. Pick a table or an area. Sit somewhere were you are far enough away from the group yet close enough to hear words that are said. Record body language…. including facial expressions, hand gestures, gross body movement.

Observe and record tone of voice only from the spoken word.

Homework/Follow-up

Attempt to interpret the meanings or what was going on in the communications between fellow humans

Body Language- Dogs

Objective:

Connect the body language observations from humans to animals. Determine if there are similarities and differences.

Activity:

Watch the Discovery Channel Video- “Why Dogs Smile and Chimpanzees Cry” VHS# 737049 0:40-0:45

First time, play the segment muted instructing the students to observe only.

Second time, again play the segment muted only this time the students will write down the different body language/communication cues that the observed

Third time, play the segment with the sound. The scientist that is being interviewed is talking about dog play.

** Both of the body language activities require the students to observe, interpret and develop written expression of the experiences. All of these skills are important to success in any field including the animal care field. To follow through and connect these two exercises, interpret the similarities between human and animal

behavior and body language.

Field Trips

Observe animals at an animal shelter. Talk to the people who work there about the personalities and behavioral tendencies of the animals in their care. If it is spring, take the students to the animal shelter to see the litters of kittens and puppies that are almost sure to be there. Observe how the mother behaves around her young. Taking them by the scruff to place them in the nest or licking them to aid in elimination, etc…as examples of instinctive behaviors that could not have been taught by a parent.
Observe animals at a shelter and determine which of the animals has aggressive behaviors. Talk to the attendants to confirm your thoughts.
Attend, as observers, a dog obedience class in session. Here there will be an opportunity to observe all different types of dogs in the presence of other dogs. List the behaviors that you observe with each dog. Compare notes with a partner after the class. Interview the owner of the dog for additional information as the behavior of some dogs differs when they are alone versus in a group. This is especially true for animals that come from a single dog household.

Final Unit Project:

Choose one of the following as a final project.

Develop a poster depicting a particular behavior type. Develop a prose to go with the poster explaining what visual cues can be observed in this type of aggression including distinguishing body postures, auditory cues, etc. The audience for this poster is clientele at a veterinary office.
Write an informational article for a local newspaper or veterinary hospital newsletter. The article may do one of the following: inform the reader about recent events around aggressive dogs in the news or inform the reader about a particular type of companion animal behavior.

Bibliography

Coren, Stanley, *How to Speak Dog- Mastering the Art of Dog-Human Communication* , Simon& Schuster, 2000.

Eibl-Eibesfeldt, Irenaus, *Ethology-The Biology of Behavior* , Holt, Rinhart and Winston, Inc. 1997.

Fogle, Bruce, DVM, *The Dog's Mind-Understanding Your Dog's Behavior* , 2000.

Goldsmith, Timothy H and Zimmerman, William F., *Biology, Evolution and Human Nature* . John Wiley and Sons, Inc. 2001.

Miller, Kenneth R, and Levine, Joseph, *Biology* , Prentice-Hall, 2000.

Marshall-Thomas, Elizabeth, *The Secret Life of Dogs* , Pocket Books, 1993.

Morgan, Rhea V. DVM, *Handbook of Small Animal Practice* , Churchill-Livingston, Inc. 1988.

Overall, Karen L. V.M.D, PhD, M.A, Clinical Behavioral Medicine for Small Animals, Mosby Publishing, 1997.

Schwartz, Stefanie, DVM, *Canine and Feline Behavior Problems* , Mosby Publishing, 1997.

The Discovery Channel Video VHS# 737049- *Why Dogs Smile and Chimpanzees Cry* 0:40-0:45