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Communication Patterns of Domestic Cats in a Home Environment

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Communication Patterns of Domestic Cats
in a Home Environment

by

Mary Ellen J. Ratuszny

A Thesis
Submitted to the
Faculty of the Graduate College
in partial fulfillment
of the
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Mary Ellen J. Ratuszny

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INTRODUCTION

It might not be so far-fetched to consider that all living things from time to time, or at all times, are trying to tell us something--if we would only stop and observe and understand. (Corey, 1977, p. 96)

Within the sizeable range of literature on animal behavior, the observation and analysis of communication systems are significant areas of concentration. The interpretation of postures, gestures, facial expressions, and vocalizations offer several key implications. First, such interpretation implies relationship and social interaction. The types of messages sent and the conditions under which they occur are often innate and species-specific (Ewer, 1961). Second, by classification of these behaviors and observations of interactions, it is possible to construct an overview of the species' social network, the rules governing the types of contact within and between species. Once this general schema is taken into account, individual differences become more apparent, particularly as a function of phylogenetic development.

This concentration on understanding the communication systems of other species can be viewed as one step on a continuum (a network of the ways in which organisms are interrelated physiologically, socially, and psychologically). After focusing exclusively on other species, the next step considers the observer as a participant in the interspecies

relationship. One method of exploring such relationships finds the observer considering his/her personal interactions with nonhuman organisms. When two or more organisms share a resident area or interact frequently, they acquire patterns of perceiving and communicating their needs, intentions, aggressions, and other messages.

A number of writers have observed the communication systems of other species and become directly involved in some degree of communicative interactions. This has occurred particularly in the course of research with primates (van Lawick-Goodall, 1971; Patterson, 1978) and dolphins (Lilly, 1975). The translation of communication systems or living in harmonious interaction with other species is discussed less formally in other works (Lorenz, 1952, 1964; Mowat, 1965; Boyd, 1974; Leslie, 1974; Schäfer, 1975).

My particular interest in felines, however, was ignited by my experience of living with a cat and attending to the interactions between us and between her and other humans. As one trained in the discipline of clinical psychology, I viewed the cats more as case studies than as experimental subjects.

Through observation of the animal's gestures, postures, and expressions, it should be possible to evaluate to a great extent how that animal interprets certain aspects of its present environment. This capability has obvious merits

in the practice of counseling or clinical psychology in addition to the traditional field of animal behavior. Before this information can be effectively applied in the counseling process, however, the clinician must develop a sensitive awareness of the client's nonverbal communications. One dimension of this exploration into feline communication behavior therefore involves a self-training in the observation and interpretation of nonverbal messages in general.

An examination of previous research with domestic cats provided two basic types of information: (a) acquaintance with the behaviors comprising feline communication, and (b) general methods of study.

The number of studies which focus on communication patterns of domestic cats are very limited in relation to the physiological, experimental, and popular literature. Observations on postures and voice were often included incidentally in studies of sexual behavior (Michael, 1961) and social interaction (Baron, Stewart, & Warren, 1957).

General discussions of behavioral patterns and situational contexts are provided in several volumes. Fox (1977) drew upon Leyhausen (1973) for an overview of postures and facial expressions. Correlates of threat and aggression displays appear to be detailed most frequently (Lorenz, 1964; Darwin, 1965; Ewer, 1968; Necker, 1970; Wada & Sato, 1973). Playful and affectionate gestures are also described (Darwin, 1965; Ewer, 1968; Necker, 1970;

West, 1974). Andrew (in Hinde, 1972) considered the general characteristics of tail movements in relation to postural anti-gravity tonus and limb extension. Kiley-Worthington (1976) provided an exclusive examination of tail movements through comparative observation.

In the classic observational study on vocalization in a home environment, Moelk (1944) used tape recordings to aid in outlining three classes of sounds, including 16 specific patterns. Necker (1970) and the Lockridges (1950) offered information on the chatter response to unobtainable prey.

Leyhausen (1964) examined the use of territory and space in social interactions, summarizing results of previous studies (Cf. 1973 publication) and naturalistic observations. Michael (1961) provided the noteworthy reflection that "the presence of the familiar human-being appears in some way to have the effect of conferring territory-rights" (p. 4) to male cats with a sexually receptive female in unfamiliar surroundings.

While the majority of the above information is based upon naturalistic observation, the authors tend to agree on the specific correlates of communication patterns. Some disparity may occur, however, in terms of functional labels. For instance, the crouched posture has been interpreted as inhibited threat (Lorenz, 1964), passive submissive display (Fox, 1977), and as a prelude to attack

Darwin (1965).

Nonetheless, I did not encounter any work that provided a detailed and complete account of the range of communication patterns including postures, vocalizations, and the situations in which they may occur. As a consequence of the widespread and partial information on the domestic cat, I became interested in categorizing the stimuli by which I interpret feline communicative behaviors.

Except for Moelk and popular writers, observations have typically not been made on the cat in the home environment. Leyhausen (1964) noted the discouraging and exhausting difficulties of following a cat outdoors. Consequently, I limited my observational field primarily to the home where interactions between us were most likely to occur. In this way, I could observe a range of behaviors in a relatively natural setting for a domesticated animal and examine situations that form part of its daily life with humans and other animals. My own lifestyle was conducive to spending time at home with the cats and intermittent visitors.

Based on the convergence of observations of other writers, I began with the basic assumption that certain postures and vocalizations are species-specific and innate. Certain correlate behaviors should then recur as patterns under similar conditions. While individuals may respond differently to any given stimulus, each set of responses

reveals a particular message. Subsequently, the observer can infer much of the cat's emotional response (e.g., fear, anger, distrust, joy) and demands for human intervention (e.g., food, outdoors, play).

Over time, I expected to become more proficient at accurately interpreting the cats' messages and responding in accordance with whatever those messages might be. This includes an assessment of the situational context involving other organisms, time of day, or physical location. Further, specific behaviors provide a key to interpretation of the context via the cat's viewpoint. In general, the cat's behavior will always "make sense." My results reflect the unfolding of this exploration over time.

As a final consideration, my purpose in carrying out this project was not to glorify the cat. I have tried to avoid sentimentality and anthropomorphism. Yet my presence as a researcher in these circumstances is inseparable from the role as a participant in a relationship where certain of the cats' and my own behaviors may change in the course of interaction.

In commenting on the difficulties of an experimental, scientific assessment of American Indian medicine, Boyd (1974) stated: "Rolling Thunder offered us the idea that experiments do not cause things to happen. Events are caused by their natural causes. There is no experiment other than a real situation" (p. 10). Significantly, Rolling Thunder

focused on the events or conditions which exist when certain other events occur.

In the present case, I readily acknowledge my personal and emotional involvement with my feline subjects. Rather than detracting from the validity of the results, my recognition of involvement has added an enlivening dimension to this project.

METHOD

Subjects

Subjects are two female domestic cats. Mysti is a Persian and Siamese mix, born September 1975. She previously lived in a large house with several adults and a small dog. The prior female owner had given the cat away at least twice; the cat was returned within 24 hours because of her "attacks" on the temporary male owners who physically abused her. I obtained her in May 1976 at seven months of age; she was spayed within the month.

Martha is a shorthair tabby, born May 1977. She was kept with her littermates until I purchased her from a pet store in July 1977; she was spayed in March 1978.

Settings

Observations were made in my own living quarters which varied as follows:

1. From May to August 1976, I lived in a 12' x 11'10" dormitory room with adjoining bathroom; during May and June, I had one female roommate.
2. From September 1976 to August 1977, I lived in a two-bedroom apartment with two female roommates. One roommate moved in April 1977.
3. From September 1977 to the present writing, the setting was a large two-bedroom apartment which I shared only with the cats.

We made intermittent visits to my parents' home,

which was also shared by my male West Highland White Terrier.

Procedures

From September 1977 to October 1978, I kept a journal account of the cats' behavior, including observations of interactions with humans and each other, solitary activity, and details of postures, movements, and vocalizations. These observations took place in the course of daily living, without my conscious attempt to systematically manipulate any aspect of their environment. Sexual and parental behaviors were excluded.

I then extracted notations on six target areas: (a) general posture, (b) tail, (c) eyes, (d) ears, (e) forehead, and (f) vocalization. From there, I noted antecedent, correlate, and subsequent behaviors of each observation. Finally, I summarized the information on patterns which emerged from the focus on the above areas.

ACQUAINTANCE

Her tail waved gently as she strutted near her owner. Though only seven months old, she had the sleek and elegant silhouette of the Siamese under a moderately long grey coat. The gaze of her bright green eyes revealed an alertness to the human voice, and her own vocalizations were delivered with high-pitched sweetness. She was a physically beautiful animal, almost regal and proud in her movements. I knew that I would take the cat from the moment I saw the waving of her feathery, Persian-like tail.

Jody, the prior owner, gave relatively little advice for living with the cat. She noted that the cat had struck out with her claws at a temporary male owner who tried to pull her from under a couch; the male consequently threw the cat against a wall. Two or three other potential owners kept her no longer than 24 hours because of her alleged aggressiveness. However, the cat occasionally curled on Jody's lap and vocalized frequently. Apparently, the cat would not be shy about demonstrating aggression, would not have physical attention forced on her without retaliation, and would respond in a calm and friendly manner under kind treatment. Finally, I was advised to refrain from touching the cat until she came to me.

Our first residence together was a single, large room that we shared with roommate Barb. The adjoining bathroom

led to another room of the same size with two female suitemates. The young cat, whom I later named Mysti, spent most of her time in my room or the bathroom. During the first few days, I noticed several aspects of her behavior. In such small quarters, we were all in view of each other, and Mysti often gazed upon Barb or me, silently, directly. By the direction of her gaze, she also followed our movements around the room. She frequently seemed a detached observer, cautiously forming an evaluation of her new environment. Interpreting her scrutiny in this way, I hoped she would come to feel comfortable and that her eventual approach might signify approval of me.

It demanded conscious self-discipline, yet I did not touch the cat. On our fourth evening together, she jumped onto my lap and began to purr. I spoke and petted her gently. She had approached me in the context of physical contact, apart from the demand for food. In this simple interaction, there was nothing of the aggressive creature that others had experienced. Her purring reflected contentment, and I felt rewarded for my self-control of four days. I saw that attention and affection could not be forced upon the cat or from her. (This is one aspect of feline behavior which some persons dislike intensely, claiming that cats are "too independent.") The notion of who controlled whom would become an irrelevant question as I focused increasingly upon interactions and contexts.

In addition to her eyes and physical proximity, I also attended to her vocalizations. When Barb or I entered the room, she lifted her head slightly and greeted us with a closed-mouth chirp of short duration. We verbally returned her greetings and spoke to her throughout the day. From time to time, she vocalized for no reason we could ascertain at the time. When we ate dinner in the room, however, she kept up a constant series of open-mouthed vowel patterns that seemed to increase in pitch and duration. After several of these disturbing performances, we decided to endure a few more tantrums in the course of shaping her manners.

We followed no rigidly systematic schedule of training, yet gave her a tidbit after increasingly longer periods of silence during the meal. After approximately one week, she waited silently until the end of our meals when she might receive a bite or lick the plate. With minor variations, this interaction has been maintained after two and a half years. There are times when she does not sit near the person eating, or she may approach the person with a closed-mouth chirp, then sit quietly till given a treat. In the latter case, the vocal pattern announces her presence and indicates her interest in the meal.

During that summer, I noticed other aspects of her behavior with humans. For instance, she hissed and growled whenever a man approached or touched her. On a first

meeting, she jumped onto a young woman's lap, sniffing and licking the visitor's face. Generally, she seemed afraid of contact with men and relatively relaxed in female company.

I suspected that her apparent fear of men was related to previous unpleasant interactions with them, such as the violent incident noted earlier. (If this was true, then the behaviors of "male approaching or touching cat" had become a conditioned aversive stimulus.) Insofar as fear is linked to the anticipation of injury or pain, Mysti's hissing and growling could be viewed as attempts to deflect a potentially painful experience. Should the human ignore her defensive warning and touch her, the cat would "escape" or strike (Cf. Ulrich, Wolff, & Azrin, 1964; Ulrich, 1966).

In addition to these social interactions, other people noticed that Mysti often followed me with her eyes. Moreover, she watched people enough for me to become aware of the fact and wonder about her "motivation."

I was fascinated with this new creature in my life.

In the course of those few months, I was also concerned with the decision of a thesis topic. I eventually realized that my primary interest, coincidentally, was Mysti. I wondered about the meanings of her vocalizations, the flicking of her tail, and her body postures. Essentially, I wondered what the cat had to say and how she said it. Out of personal interest, I was prepared to keep a journal

account of her communicative behaviors and the interactions between us. By the beginning of September, Roger had encouraged me to turn the personal interest into a thesis project. The observations contained in this section on Acquaintance therefore reflect the most potent memories I have of Mysti prior to beginning the journal in September 1976.

Since little precedent existed for this particular type of study with cats, I encountered various problems and concerns in several areas of the project. In terms of gathering data, my objective of interpreting communication behaviors of domestic cats has been reached primarily through careful observation of my own cats. Many of my observations received supportive confirmation from the evidence of other writers noted earlier. While these are not necessarily discussed in this paper, additional information came from (a) my occasional observation of other cats, and (b) comments from visitors and roommates that the cats behaved in certain ways.

However, the process of writing proved more challenging. The essential problem was to achieve a style of presentation that coherently reflected both the ongoing relationships and my interpretations of the cats' messages.

The role of postures and communicators nearly took a fragmented emphasis when I attempted to categorize meanings based upon certain movements. While this is partially valid,

a more complex picture is approached by looking beyond topographical themes. In order to consider the wider dimensions of function and context, the observer occasionally needs to imagine the cat's viewpoint and to abandon the illusion of intellectual objectivity. For present purposes, this illusion consists of thinking that (a) the human observer sees all that can be seen during an interaction, and (b) that the human interpretation of events necessarily reflects the same "meaning" or function as it does for the cat. One barrier to such "letting go" is the frequent awkwardness of our own language, apparent in the way we transitively conceptualize certain events (e.g., "She flicked her tail," or "She arched her back."). Rather, we simply observe variations of movement and rest.

Perhaps the most formidable barrier to "understanding" cats or other species stems from the simple fact that many humans are reluctant to acknowledge the probability that species other than primates or dolphins are capable of some degree of reasoning, thinking, or problem-solving.

In A New Guide to Rational Living (Ellis & Harper, 1975), Maultsby is quoted on four aspects of "thinking":

"Rational thinking has the following four characteristics: (1) It [bases itself] primarily on objective fact as opposed to subjective opinion. (2) If acted upon, it most likely will result in the preservation of your life and limb rather than your premature death or injury. (3) If acted upon, it produces your personally defined life's goals most quickly. (4) If acted upon, it prevents undesirable personal and/or environmental conflict." (p. 23)

By sharing an environment with certain other species, the observer can note examples of intelligent behavior (in contrast to basic reflex behavior). For instance, Mowat (1965) described several techniques which wolves use for testing the weaker members in caribou herds of various size. In addition, he was informed that some Eskimos were so sensitive to wolf vocalizations "that they could quite literally converse with wolves" (p. 95), and he subsequently witnessed examples of an Eskimo's appropriate response to such vocalizations.

While much of human thought takes the form of private self-verbalizations, I surmise that cats, wolves, and other higher mammals similarly manipulate images, sights, sounds, and smells (Cf. Corey, 1977, for observations on cats in the home).

Despite the limitations of the necessities of feline existence, an astute observer may infer that cats utilize reasoning processes. By attempting to see as the cat sees, the observer gains a more intimate look at an otherwise "mysterious" or "inscrutable" creature.

Unfortunately, the lack of a common sign or sound system of communication between cats and humans constricts our knowledge of the cat's perceiving and reasoning capacities. Unless such a system were developed, all we may ever learn of feline messages would be limited to (a) interpretation of emotional responses, and (b) assessing

wants, needs, and preferences as they exist in the present moment. How the cat reasons and its conceptions of a past or future may remain unanswered (Cf. Rampa, 1964, for thoughts on the interesting frontier of telepathy with cats).

Finally, a recurrent hindrance to writing has been the cats themselves. As I wrote or typed, they nudged my hands, vocalized for food, play or outside, or swatted around pages of the manuscript. There were also numerous times when I gazed at them for being utterly beautiful animals. . .

PERSONALITIES AND POSSESSIONS

The Basic Cat

Individual cats vary in temperament and tendencies toward certain behaviors partly as a function of breed (Fireman, 1976) and partly through their own histories of experiences. However, the domestic species shares a number of characteristics with the "great cats" (lions, tigers, leopards) and other felines (Larousse Encyclopedia of the Animal World, 1975). Physiologically, the cats are well-equipped as solitary, carnivorous hunters. (An exception is the lion, for whom the pride is a social unit and hunting is often a combined effort [McBride, 1977].) Muscular hind legs provide momentum as the cat springs or pounces upon its prey or lies on its back, kicking an aggressor. Retractable claws facilitate gripping and defensive slashing as necessary. (The cheetah is an exception to the extent of having non-retractile claws.) The powerful jaws, containing teeth designed for effective biting and tearing, are yet gentle enough to transport the very young.

The comforts or requirements of feline life include a sufficient water and food supply, a periodical mate, a range for hunting, and undisturbed areas for sleep and rest. The cat knows its territory and is sensitive to strangers

who venture therein, such as humans or other cats. In the case of domestic cats, the home territory often consists of a residence shared with humans and the surrounding fields or neighborhood. Domestic cats are also more tolerant of each other's presence than is typical of wild species (Leyhausen, 1964).

In our "civilized" environments, the cat enjoys soft cushions or couches, chairs and other raised surfaces for perching, regularly provided meals, and a certain degree of human company. By virtue of the domestic cat's relative size (Fox, 1977), the hunt is limited to the pursuit of insects, birds, small rodents, and rabbits. When live prey is unobtainable, chasing balls and playing "hide-and-seek" with an understanding human are amusing pastimes and provide exercise. Interactions with other domestic cats include the contexts of play, mating, aggression, and grooming. Leyhausen (1964) also notes the subtle form of companionship afforded by quietly sitting near each other.

The First Year

My relationship with Mysti and her behavior toward me have undergone several transitions in the past two and a half years. As noted during our initial acquaintance, she was watchful of human movements, amiable in her greetings, and ill-mannered during mealtimes. I viewed her jumping onto my lap as an indicator of change, whereby we could

begin to trust each other and get on with the business of living together.

Our course unfolded in jealousy, possessiveness, affection, contentment, and privacy. Though often reserved and cautious, she is also a passionate cat, demonstrating both happiness and anger with unmistakable intensity. After six months together, we had our first misunderstanding in a conflict between human sympathy and feline jealousy.

At our first apartment, our ground-floor residence was located at the rear of the building. We entered by an outer door into a maze-like hallway bordered by individual apartment entrances. Through the sliding glass doors in our living room, we could see anyone who entered the building from the rear. One of the building's intermittent visitors was a stray tomcat whom roommate Gail knicknamed Bosco.

One evening, we saw Bosco enter the building behind other residents. On that occasion, he seemed to limp, and we decided to give him a closer look. Bosco must have stopped outside our door, since Mysti approached, sniffed around, and sat watching the door. Gail and I went out in the hall and each held the cat, examining his leg with our hands.

When we returned inside, Mysti was still near the door. I picked her up, consciously wanting to reassure her of my affection. (Yet I did not discount the

possibility that I somehow desired to alleviate my guilt for having stroked another cat.) She sniffed my hands for some time and then hissed.

I quickly dropped her and firmly said, "No!" Without looking at each other, we walked away in different directions. I diverted my irritation by reading in my room.

Mysti's defensive hiss indicated her disapproval of Bosco's scent on my hands. My response was a mild attempt to punish her hostile vocalization toward me. Through physical distance and lack of eye contact, we terminated the unpleasant interaction.

When I later came back to the living room, Mysti hissed again. I responded once more with "No!" She then sulked off to "her" kitchen chair.

Shortly afterward, she went over to roommate Lynda on the couch and started to play. As Gail and I discussed Mysti's jealousy, the cat stopped attending to Lynda, turned, and glared directly at me. The effect of sheer hostility was strengthened by her half-closed eyes and ears turned distrustfully to the side. After several seconds, she returned to the privacy of her chair.

Mysti seemed to know we were discussing her. Her anger toward me had not subsided. From her perspective, her disdain was justified by what may have been an offense against her position of feline prominence in our residence.

On the following day, she jumped onto the desk near me.

I greeted her verbally and petted her, scratching her head and ears. When she lay down on the desk and purred, I recognized that she was again comfortable with our physical closeness. In this case, no threatening stimulus was present (i.e., the foreign scent of another cat), and Mysti was therefore likely to behave toward me in a contented manner.

As noted in these interactions, the cat's messages are comprised of a variety of correlated movements. Subtle changes in facial expression and orientation of the ears illustrate a relatively wide range of observable emotional and behavioral responses. Quite often, I found myself attending particularly to Mysti's eyes. While the direction of her gaze suggests the object or person of interest, the extent of pupil dilation and eyelid closure usually indicates the degree of emotional excitability (e.g., anger, attention, distrust, happiness). Ordinarily, I looked for other supportive clues so that my responses would be appropriate to her messages as I interpreted them.

As I sat reading at my desk one morning, I heard Mysti "meow" in the other bedroom. The open-mouthed vowel pattern typically reflects a demand or request, so I turned to face the doorway in anticipation of her next response. She sprang into the hall, stood in the doorway, stared at me with widely opened eyes for several seconds, and dashed off toward the living room. The round, full eyes are an element

of the "play face;" when she ran away, I quickly understood that she wanted me to chase her. For a time, we chased around the living room and kitchen, played with a bundle of yarn, alternated turns with the ball and "hide-and-seek." When she apparently had enough, she curled up on the floor and ignored my further enticement to play.

When Mysti indicated that she wanted to play, I felt annoyed at having my reading disturbed. Nonetheless, I felt sure that I had interpreted her message correctly and consequently wanted to reward her approaching me for these games.

Many of our interactions occurred when Mysti sought my intervention for attaining some desired goal or activity (e.g., food, play, outside, physical contact). As cats are relatively self-sufficient creatures, they will enlist whatever resources are available to reach their objectives. For instance, Mysti's last resort at rousing me in the morning was to swat the earrings on my dresser. Since I had scolded her as a kitten for playing with jewelry, she eventually limited that behavior solely to wake-up conditions where I was certain to be aroused.

Cats do not ordinarily vocalize unless they have something to say. Vocal patterns are certainly a most richly diversified set of feline communicators. Pitch, tone, and other qualities differ between cats. A listener can therefore distinguish one cat from another on a purely

auditory basis after repeated exposures to the cats' voices.

Yet certain regularities occur with regard to intensity, volume, repetition, and type of sounds. Particular sounds accompany various sets of behavioral responses and can be classified along three basic dimensions: (a) murmur pattern (e.g., purr), produced with the mouth closed and indicates a relaxed or friendly mood, (b) vowel pattern (e.g., meow), produced with the mouth first open, then gradually closed, and used to express demands and dissatisfactions, and (c) strained intensity (e.g., hiss, growl), produced with the mouth held tensely in a certain position and emitted during attack, defense, and mating encounters (Moelk, 1944).

The cat's vocalizations can thus offer key information on its mood or disposition toward a subsequent behavior. With practiced attention, I found that my skills in sound discrimination seemed to increase over time. However, there were times when I missed the significance of certain communicators until later reflection--as in the following exchange.

A man whom I met once came by unexpectedly. I felt quite uncomfortable at his presence in my apartment and sat facing him across the room. Mysti approached him to investigate as she did with all strangers and acquaintances. She spent an unusually long time sniffing his shoes.

I commented, "Say, I wonder why she's sniffing so

much."

"Well, cats all really like me."

I knew his answer was definitely in error. From where I sat, I could not see Mysti moving in any way that might be interpreted as friendly. She remained still, sitting somewhat rigidly, sniffing lightly, and occasionally turning her face away.

After a few minutes, she jumped up next to me on the couch, stood, and looked at me directly. She mewed softly. I scratched her head, saying something like, "Good girl, good kitty." She turned and walked away to lie near the door.

In retrospect, I realized the significance of the interactions. I had discounted her message by simply petting her and saying the situation was all right, while feeling quite the contrary.

Gail had been sitting near the visitor and was in a position to observe Mysti's face during the first few minutes. She later noted that Mysti would occasionally curl her upper lip while she sniffed and then turn away. This further observation suggested that Mysti perceived an unfamiliar odor which may also have been unpleasant.

While scent can alert the cat to danger, further investigation of the stimulus is often through sight and sound (Necker, 1970). However, the flehmen reaction is observed during more intense olfactory inspection. As in

horses and dogs, two ducts leading to the vomeronasal (Jacobson's) organ are located in the palate behind the upper incisor teeth. By opening its mouth near the stimulus, the cat receives an amplified perception of the scent. This response typically occurs when the cat inspects the scents of other cats or catnip (Fox, 1977).

As the cat's mouth opens in this response, the upper lip may appear to curl--an expression which connotes disdain when exhibited among humans. I would be tempted to acknowledge Mysti's contempt of the visitor, yet this conjecture could very well be an anthropomorphic error. Nonetheless, her subsequent behaviors (approaching me, staring directly, and vocalizing) strongly indicated apprehension and urgency surrounding her message. In addition, she may have sensed my negative feelings toward the person when I entered the room and did not act in a friendly manner toward him.

With this incident, I was becoming more aware of subtleties in her facial and vocal expressions. Moreover, I recognized certain dimensions in our relationship. From my own perspective, I began to trust Mysti's judgment of visitors to our apartment. I would consider whether she seemed relaxed or nervous, friendly or indifferent. In attempting to surmise Mysti's perspective, I saw that she had come to me with her apprehension rather than approaching Gail or going away silently. According to feline social

patterns, she was sensitive to some intrusion upon her home. Whether she saw me as sufficiently powerful to remove the visitor, or whether she warned protectively against something amiss, she considered me as part of her home.

By January 1977, Mysti was responding differently toward men than she had initially. She no longer behaved anxiously or defensively around all men. This may have been due in part to finer discriminations of my own regarding whom I allowed to visit. As I tended to prefer friendly and gentle people who also had some affinity for other creatures, Mysti rarely had occasion to feel threatened by humans.

During one of our weekends at my parents' home, an uncle stopped by to visit the family. When I entered the living room, Mysti was perched calmly across the top of the chair where he sat. I was told that she had been there when my uncle arrived, and she remained there for some time. Especially in light of a first meeting, it was her most serene response to a man that I had observed. Although he occasionally raises his voice, he is a fairly easy-going and sociable person. Mysti had undoubtedly perceived something of these qualities within several minutes and felt comfortable in such close proximity.

Yet there was one situation involving men in which Mysti revealed her dissatisfaction: my own physical proximity to men under certain conditions. If we

understand jealousy basically as envy or resentment at the attentions shown toward someone perceived as a rival, I do not doubt that some cats can exhibit jealous behavior. For Mysti, this has been manifested by "droppings" in my room or dry wretching during intimate moments. Her timing on such occasions convinced me that her behaviors were more than coincidental.

In the following example, Mysti let her presence and feelings be known in a fairly subtle and disarmingly effective manner. Through her use of space, she temporarily confronted the visitor. By her simply glaring at us, I felt quite nervous--a response which is typical of mammals when stared at.

Ron and I were sitting close together on the couch. Mysti jumped onto the coffee table in front of us and moved several items over the edge of the table. In turn, she batted around--then pushed off--the newspaper, a letter, a matchbox, and several papers. She then sprawled out in the space she had cleared and stared at the two of us. At that point, Ron put his foot up next to her on the table, and Mysti responded by stretching out her forepaws against him. She remained in the reclining posture, yet drew back her ears defensively. She soon left the table and lay against the hallway wall, ever watching us.

Mysti's expressions of jealousy did not occur consistently enough for me to view them as a problem.

In fact, her behavior toward certain regular male visitors eventually became quite affectionate (to be discussed later). During the past year, I have observed her interfering tactics on a single occasion in which she had seen the male once or twice previously. (Perhaps Mysti requires several social contacts with a male before she approves his more intimate contacts with me.)

The cat's sensitivity to physical distance and handling are one of the predominant features of its social contacts, whether with humans, cats, or other creatures. Despite the lessons of space and contact I had learned during our acquaintance, I was frequently tempted to pet Mysti for the sheer pleasure of stroking her soft fur and delicately shaped head. Respecting her private space and interpreting her signals in this area often tugged at my patience, until I saw the futility of feeling rejected.

During one such typical interaction, I went over to pet Mysti where she napped on the couch. Her tail started to swish, and she opened her eyes. She did not move as I stroked her body, yet followed the movement of my hands with her eyes. The flicking tail may be observed when a cat has sought contact, yet it may also indicate irritation or a preparation to move. In this case, Mysti did not evidence any behavior which implied enjoyment, and the tail movement in itself was an ambiguous signal.

When I returned to my chair, she began to lick herself

over the areas I had stroked. I noticed several times previously that she groomed after unsolicited stroking. (Although the licking may serve to remove an undesired scent, I cannot attribute any other specific function to the behavior in this context.) On the other hand, she did not necessarily groom after she approached me for contact. Her behaviors then clearly indicated her desire. The arched back, vocal pattern of request, and nudging her forehead against my hand always elicited my attention and contact.

This incident reminded me that she would maintain a relationship on her own terms. She never failed to demonstrate in some subtle or very overt manner that she would enjoy physical affection only upon her request.

Throughout the months of developing a close relationship with Mysti, I gradually discovered her own capacities for patience and persistence. The ability to wait quietly and observe is one of the most adaptive characteristics of general feline survival. Stalking and hunting demand consistent observation of the prey's movements, a sense of timing for the right moment to leap, and accuracy in gripping and biting. If the prey escapes, the cat begins the pattern again or seeks another victim.

While I have seen Mysti pursue small prey in this manner, I have also seen her maintain the privacy of her immediate space in a manner I would call persistent.

After spending Thanksgiving and Christmas 1976 at my parents' home, Mysti became familiar with Pixie, my West Highland White Terrier. The frequency of their aggressive altercations decreased, and they appeared to establish fairly peaceable and occasionally playful relations. Yet Mysti exercised her dominance from time to time.

One afternoon, Mysti was stretched out across the hallway floor when Pixie strolled toward her. She hissed several times in defense of her space. Pixie stopped, alternately looking toward her and away. He finally turned and retraced his steps. A few minutes later, he tried to approach Mysti again, with the same results. Whatever her motivation, she simply did not allow the frustrated terrier to pass or disturb her resting place.

Over time, I saw my initially suspicious and defensive cat exhibit more approach and play behaviors not only toward my roommates but to certain visitors as well. As in the last example involving the terrier, Mysti also seemed more confident in defending her space and familiar territory.

At the end of April, Gail moved to another apartment; Mysti and I had one less person with whom to socialize regularly. Although she most often seemed occupied in solitary activities and going outside, I felt content in the time she did spend around me. In addition to play and stroking, we periodically just sat or rested near each

other. Between our separate activities and times together, we settled into a comfortable and deepening friendship.

When she vocalized, I nearly always attended to her. If possible, I obliged her requests--usually in matters of food, play, or going outside. While her tendency to vocalize may be linked predominantly to her Siamese heredity, I have encouraged the tendency by my own responses. Furthermore, I talked to her throughout the day. For instance, I commented on bugs she chased, or told her that the person who just entered the apartment building was not coming to visit us. When she evidenced interest in any of my activities, I showed her what I was about (e.g., "That's only coffee, Mysti. It's hot."). At times, I told her when I was tired or did not want to be disturbed.

In terms of teaching her my words, I used the same conditions that facilitate language acquisition in small children: "close daily contact and satisfaction of needs, associated continuously with vocalized words" (Lilly, 1975, p. 33), plus pairing words with objects and actions. In terms of my attitudes and perceptions, I tried to accept her jealousies, anger, physical contacts and view her as an equal with a physical composition somewhat different from my own. Of these two processes, the second is more difficult for humans to maintain--whether in relationships with other adults, children, or nonhuman creatures.

A Two-Cat Household

On the evening of July 14, 1977, I brought home Martha, an eight-week-old tabby female. One of her first responses to Mysti was the arched back defensive threat; she hissed and growled with a volume much like an adult cat. If I left the living room for more than a minute, Martha began to cry.

Within a few hours, Martha had explored numerous objects in the living room. Like a child, she put her mouth on everything. . . my skin, clothes, electric and phone wires, book bindings, pens. Her training began immediately: "No" for eating plants and books. As she came toward me, I said "Come" in order that the word should become associated with the movement of approaching me. When I spoke, she turned and looked responsively into my eyes. In discipline, feeding, and physical contact, I quickly assumed the role of dominant female caretaker.

I had anticipated that Mysti would be upset by the new cat, yet I was not prepared for the extent of the change in her behavior. She watched the kitten constantly when in the same room and occasionally chased her down the hall and into doors. Mysti's hissing and growling at such times demonstrated the seriousness of her chase.

In addition to intermittent aggression toward the kitten, Mysti vented her displeasure upon me and any other

human who visited. She growled or hissed when I approached her and when I spoke to her as she walked past me. After two days, however, Mysti greeted me at the door and allowed me to pet her. I sat at the kitchen table, holding her in my lap and speaking gently. She purred and seemed fairly content--until Martha bounded into the room. Mysti then jumped off my lap, hissing, and ran toward the kitten.

So long as Martha was near me, Mysti stayed away. When I returned from several hours' absence, Mysti then approached and greeted me.

During our first week, Martha and I maintained very prolonged physical contact. When I napped, she frequently curled under my chin or across my neck, purring till she fell asleep. At times, she licked or nibbled my nose and mouth, pushing her forepaws against my chin with the treading motion of nursing kittens. While I would have been flattered to interpret such behavior as affection, I surmised rather that she found me a warm and comforting maternal surrogate for that period in her development. (After approximately one month, the licking around my mouth had decreased in frequency and was not maintained thereafter.)

At 10½ weeks, Martha still followed me around and usually remained in the same room as I. Physical contact was not as frequent or prolonged as during the first week. Proportionately, her independent activities increased: playing with toys, running, jumping on and off furniture,

approaching me and Mysti for play.

Martha's vocalizations were still quite limited. I observed purring, hissing, growling, and a vowel pattern similar to a prolonged "ě." The latter was a demand to be held or receive bits of my meals. She also emitted a closed-mouth, repeated "chirring" during play, very similar to Mysti's greeting and anticipation patterns, all indicating pleasant moods.

After only a few days, her vocalizations seemed to increase in number and duration. She emitted a short "ēē" when she wanted to be released from my holding. If unheeded, she repeated the sound with prolongation and wriggled in my arms. When begging for tidbits as I worked with food in the kitchen, her cries became a loud, prolonged "mǎ" with fully opened mouth. (Neither cat vocalizes as such when I simply wash dishes.) In addition, she whined very much like a young child after I reprimanded her or took her away from an interesting but forbidden object. Each of these three patterns has been maintained under similar conditions.

As for Mysti, she no longer slept in my room at night as was her custom previously. However, she gradually demonstrated certain behaviors which indicated the potential of a truce, forgiving my transgression against her feline supremacy. By the end of July, for example, she would jump onto my bedroom windowsill in the morning; she made no attempt but a single "meow" to wake me as she once did.

Although she no longer rolled joyfully when I returned to the apartment, she stood quietly and let me pet or scratch her.

I perceived a certain regularity or pattern among Mysti's responses to changes in her social environment. Her way of dealing with physically or emotionally unpleasant stimuli in relating to humans has typically been defensive withdrawal. In this case, the shock of sharing her home, food, and litter box with a frisky kitten may have shattered the trust she had for all humans, indiscriminately. She again withdrew contact, and her vocal patterns consisted primarily of hissing and growling in the event of contact. Toward Martha, however, she behaved aggressively through chase and attack. In this, I saw the old instinctual feline tendency to drive off intruders from one's territory.

With continued exposure to non-threatening humans, Mysti's behavior softened so that she again approached and interacted with familiar persons. Her apparently random attacks on Martha not only seemed to decrease, but I gradually saw her aggression limited to play-fighting, defense when she preferred to be alone, and reprimanding Martha for specific events.

A clear example of the latter condition occurred at the end of July. In the process of setting out typing materials, I also set a cup of coffee on the kitchen table. Martha discovered a pencil in the course of nosing around

and batted it around the table. I momentarily turned away and then heard the crashing and splattering of the cup on the floor. In a loud and angry tone, I yelled several profanities.

As I looked over the minor damage, both cats sat about four feet away, quietly watching me. My initial anger had not diminished, and I shouted, "Both of you settle down!" (It was, of course, easier to blame the cats for my carelessness.)

Mysti thereupon turned to Martha, snarled, and swatted the kitten's head. I am completely convinced that Mysti recognized my unfairness in yelling at her also, when Martha alone had misbehaved. Mysti simply dealt out the appropriate punishment herself.

Recovering my better sense, I reassured Mysti she had done nothing wrong. I ignored Martha. For the sake of my peace of mind and hers, I obliged Mysti's request to go outside. Martha, on the other hand, indicated her own closure of the incident by a burst of solitary play.

Further change in the cats' behaviors came gradually. Martha seemed to reach her childhood stage during September, testing and exploring her environment in more complex ways. While I verbally and tactilely rewarded appropriate behaviors (e.g., sitting in my lap, coming when called, playing), I needed to reprimand Martha for increased mischief: digging in garbage, batting cigarette butts from ashtrays, sticking

her face in my dinner plates, and shredding toilet paper. Nonetheless, she often curled in my lap, watched my activities, or rested in the same room. Despite the necessity for frequent discipline, I was apparently still a pleasant human to be around.

Martha also usurped Mysti's former position as the lap cat. In addition, Martha seemed to initiate most of the inter-cat squabbles, wrestling, and chasing. Consequently, I anticipated that Martha could very well become the dominant cat when she reached adulthood.

Yet patience and tolerance are qualities which distinguish certain areas of feline dominance in quite subtle ways. As Leyhausen (1964) notes, a superior cat may often give a lower-ranking cat the right-of-way when paths cross. Nor will a dominant cat typically attempt to dislodge a subordinate from a resting place. The sense of privacy is central to a mature cat's integrity.

As the months passed, it was exceedingly rare for Mysti to approach Martha as the latter rested. Only when Mysti was obviously intent on following an object from a particular windowsill would she jump next to Martha on the same perch. Despite Martha's apparent assertiveness, I intuitively waited for a time when Mysti might reestablish her place in my lap, roll happily to have her stomach tickled, and seek me as a quiet companion.

After Martha lived with us for two and a half months,

Mysti took one occasion to jump on my lap and curl up for stroking. For the following year, this was to be an unusual occurrence. However intermittently, I felt reassured that she maintained our social bond to this extent.

The initial months of domestic turmoil had ended. Martha slept with me and woke me each morning. I played with each cat individually, and they occasionally played together. Mysti maintained her interest in visitors, while Martha tended to ignore other humans.

I was then fairly secure in my ability to interpret their moods and requests. One of the more dramatic events occurred on a rainy night in November 1977. I returned home around midnight and noticed the bottom of a storm window sticking out much further than usual. As I maneuvered the window back into place, I saw Mysti gazing wide-eyed at me from inside the apartment. I thought it a bit odd that she did not jump to the top of the couch by the window, as she usually did when I walked outside toward the front door.

Neither cat met me at the door, contrary to their custom. Mysti was crouched underneath the couch, and it took some calling for Martha before she appeared in the doorway of the front bedroom, sitting quietly. Martha did not purr or seem excited to see me as she usually did.

I crouched on the floor and spoke to Mysti, then noticed several droppings--an obvious response to extreme

anxiety or fear. When she finally emerged, she crouched, moving slowly, ears pointed sideways, pupils wide, and tail curled around her body. She hissed and growled at Martha, then scurried under the couch again.

As for Martha, she sniffed cautiously at certain points in the apartment: around the couch, areas of the carpet, at the hallway cupboard, and at a low table in my room.

After considering Mysti's fear reaction and Martha's sniffing, I was so sure someone had been in the apartment that I called the Kalamazoo Police Department. (At that point, I too was feeling quite nervous at the thought of an intrusion upon my home.) A few days later, however, I guessed the identity of our intruder: a neighborhood tomcat, notorious for uninvited entries into other houses. My evidence primarily included three factors: (a) I saw him prowling around the apartment, (b) the space between the open storm window and the couch was just large enough to admit a small creature, and (c) the areas Martha sniffed were level with the approximate height of a cat. In this case, the cats' behaviors strongly reflected their interaction with the threatening stimulus, even after the tomcat had left the apartment.

Despite the fact that we encountered few conflicts that could not be resolved immediately, I was periodically disturbed by one personal issue: my own jealousy. Whenever

Mysti had jumped onto another person's lap, rubbed her forehead against someone's hand, or slept on my roommate's bed, I felt envious of those attentions. I relished my prominent status as the top human in Mysti's life.

It was finally during the latter months of 1977 that I allowed myself to even accept Mysti's affectionate gestures toward others. From November to March 1978, she was extremely demonstrative toward an intimate friend of mine who visited several times per week. I became accustomed to her lying in his lap, rubbing against his face, and being near him. Now and then, I did feel envious. Yet in some way, I was discovering one of the most important aspects of interpersonal behavior that occurred in our relationship.

If I responded toward Mysti with feelings of jealousy, I experienced that much less affection for her or satisfaction at her increased sociability. (I admitted to feeling that I had provided an environment to facilitate approach behaviors.) To accept what she does can bring jealousy, but I have a choice of reactions. When I accept her responses toward other persons, I can appreciate her complexity as a cat and as an integral member of my household.

On a basic emotional level, this process seems to operate as much for cats as it does for humans. Mysti is as much aware of my tones of voice, hostile stares, or

smiles as I am of her nonverbal messages. Whether from a conscious decision or simply feeling more relaxed with her attentions toward my friend, I often found myself smiling at such contacts. Eventually, I was secretly pleased that she responded so favorably. . .concurring with my own feelings toward him.

Temporary Guests

Mysti, Martha, and I had settled into a comparatively peaceful life together over the fall and winter months. At the end of April 1978, I introduced further changes in our environment. As an animal care volunteer for the Kalamazoo Nature Center, my first charges were five rabbits approximately three or four days old.

I initially let both cats look at the rabbits. Mysti put her forepaws on the top edge of their box and peered inside. She made no further response toward the rabbits. While their relative lack of movement may have eliminated them as prey, Mysti almost seemed to know they should not be played with or hunted. In contrast, Martha eagerly jumped into their box and sniffed them. I assumed that she was simply curious, since I observed none of the muscular tension and cautious stalking associated with hunting behaviors. I then isolated the rabbits in an extra bedroom, closed to the cats.

In general, both cats became aroused in the presence

of subsequent rabbits and birds. With each introduction, the cats moved quickly, attempted to locate the animals by scent, and watched them closely when discovered. Their behaviors toward me did not change in any noticeable way, except to lie occasionally before the door of the animal room and vocalize for admittance.

Then the raccoons came to live with us.

The first pair of seven-week-old kits stayed for one week, while their usual caretaker was out of town. Although much of their time was spent in a large cage in the hallway, I let them out around mealtimes and to romp on the living room couch.

Mysti thoroughly resented the kits. Whenever she saw them or came near their musky scent (e.g., resting places, cage), she turned away and usually hissed. As I still had birds in the extra bedroom, Mysti's space was encroached upon quite drastically. Coupled with the fact that I had less time for interactions with her, my friendly relations with Mysti were on the downswing.

On the other hand, Martha calmly watched the kits at play, at rest, and while I fed them. For six days, however, she moved away quickly when they tried to touch her. In keeping with her good nature, Martha never demonstrated the angry hissing or growling characteristic of Mysti. Neither did I observe the wrinkled forehead, ears tilted sideways, and partially closed eyes that

comprised Mysti's scathing looks toward me.

On the sixth evening, I witnessed an event that demonstrated the cumulative effects of familiarity and my own gentle handling. One of the raccoons curled on my lap, and Martha lay next to me on the couch. I simultaneously stroked each animal. In the course of moving around, the raccoon touched Martha and nibbled lightly at her fur. I continued stroking and talking to Martha, who was by then quite relaxed and contented. She wriggled and protested when the raccoon started to climb onto her body. I pulled the kit back onto my lap, and Martha relaxed again, permitting gentle exploration by the kit's busy paws.

My third raccoon was larger and more aggressive than the young kits. I guessed that Ranger was over two months old when I received him--old enough to have the run of the house for exploring and climbing. At night, I returned him to the cage.

After a week, the cats and raccoon confronted each other in the living room and kitchen. The cats assumed the defensive threat posture with arched back and tails hooked downward. Ranger took his own threatening stance of arched back and head held down. After some cautious moving around each other, Mysti approached Ranger directly and hissed. The raccoon backed away. (This was probably a job for the primary protector of the home range.)

Martha and Ranger then had an altercation of hissing,

growling, and mutual swatting over the cats' food dishes. The raccoon backed away, and I intervened to scold him. In later conflicts, Ranger would eventually retreat several steps. I finally solved squabbles over the cats' dishes by moving them to the kitchen table, away from Ranger's interference.

I still had Ranger when I accepted the fourth raccoon, a young and very weakened kit. As Thomas recovered from his illness, I permitted him to play with Martha. She seemed to enjoy wrestling with the kit, who was not so aggressive in biting as Ranger.

Throughout July, Mysti maintained relative seclusion from me and the raccoons. She also went outside for several hours at a time. Although Martha enjoyed being outside, our relations were as cordial as ever.

Absence and Reestablishment

At the end of July, I returned the raccoons to a pre-release pen at the Nature Center. I then moved the cats to my parents' home, while I spent the duration of August away on vacation. According to my parents' report, Martha spent much of her time in my bedroom. She intermittently played with Mysti or my mother.

This new change provided Mysti with a rest from previous competition with other animals. She apparently socialized frequently with my parents and visitors, to the

extent of curling onto laps and allowing herself to be petted. She was regaining her former status as the dominant cat, receiving increased social attention, and enjoying the admiration of visitors.

Since the cats and I returned to our apartment in early September, our interactions have maintained most of the patterns they established during August. Mysti is once again the playful, talkative, and affectionate animal I knew before Martha's arrival over a year ago. While Martha sleeps on my bed at night, both cats now engage in waking me. They play together quite vigorously, and Martha still encroaches upon Mysti's resting places. Just being in the same room together, resting or sitting quietly, remains one of our most frequent and comfortable activities.

The most apparent changes have occurred around Mysti. We now play alone together, and she rolls to have her stomach tickled. She jumps onto my lap several times a day, whereas Martha may now curl on my lap four or five times per week. I would say that most of my interactions and conversations now occur with Mysti, though I have not neglected Martha.

As an aside, the issue of jealousy finally seems to be resolved. Mysti was very demonstrative toward the man who visited us regularly at the end of 1978, and I no longer felt threatened by such overtures. We were both

evidently content with the attentions we received.

As I reflect on the relationship changes in the past two and a half years, I more fully appreciate the personal intricacies of the "mysterious" cat. What we call trust may be a very tentative and elusive quality. When trust, respect of mutual space, and affectionate behavior are attained, however, the resulting friendship between two essentially private creatures can be a rare and precious leap across the deceptive borders between species.

On a simpler level, this project had several outcomes. First, I trained myself to watch the cats closely and to observe minute changes in their varieties of expression. Second, I used my imagination to see as the cats saw and thereby delineated contexts for their expressions. Third, I reflected on a series of changes over two and a half years which revealed patterns of contexts, the fluctuating contours in the relationship.

Finally, I observed myself. For exercising my sensitivity to the space of other organisms, calmness when faced with anger, and a reinterpretation of my response to jealousy, I am grateful to the cats.

DISCUSSION

Connecting Links

In addition to documenting the salient features of domestic cat communications, this study reveals several commonalities between humans and the cats in terms of communication, emotions, and the process of living together. As noted in the Introduction, nonverbal messages can reflect and indeed predominantly comprise an organism's interaction with its environment at any given time. That is, an organism is constantly in the process of "emitting" nonverbal messages. For humans and cats, similar channels of nonverbal communication include posture and muscle tension, eye movement and direction, vocal tone and pitch, physical contact, and distance from another organism.

These physical components, in addition to an assessment of situational context, form the basis of what we call emotions. An emotional label is essentially a symbol for a particular response set, whether we observe a cat, another person, or label our own experiences. From my perceptions of the cats' behavior, I can therefore label certain of their response sets as angry, distrustful, happy, frightened, or relaxed (Cf. Joshua, in Fox, 1968, for clinical perspectives).

Emotional behavior is a significant aspect in

relationships between intimates who live together, whether the social unit is exclusively human, cat-human, or cat-cat. Some degree of conflict and frustration between the desires of each member seems to be an inevitable component of social existence. In living with the cats, my conflicts with them typically occurred in matters of their seeking a response from me which I was reluctant to perform at the time (e.g., wake up, play, let them outside).

Yet the issue of jealousy was the most troublesome. As noted earlier, Mysti and I both managed to alleviate the difficulty. Mysti's hostility may have decreased as a consequence of repeated exposures to men who did not harm her. My own feelings changed by the additional effect of relatively calm self-examination. The key to subduing my jealousy was acceptance of Mysti's behavior toward males rather than wishing she were not so friendly.

The implications of the dynamics of jealousy extend further, however, for those humans willing to examine them. A primary consideration is the subtle assumption of some degree of ownership (possessiveness) or control over the choices of another creature. Barring coercive tactics, no one can force affection upon or from another creature. Those who delude themselves otherwise set the stage for resentment, dissatisfaction, anger, and blaming the other.

Another consideration involves the irrational need to be the sole recipient of another's affection or caring.

While cats may initially act aggressively toward intruders upon their home, food, litter box, and human companions, the aggressive behavior decreases over time. It could be said that cats thereby learn to share under certain domestic conditions. When humans retain the need for exclusive affection, anything less than consistent fulfillment of this need may engender depression and anger.

Jealousy can thus be viewed as having several components: (a) envy at the attentions given to someone else by one's mate or companion, (b) fear of "losing" the other to someone else, (c) needing those attentions completely for oneself, and (d) results of anger or depression when those needs are not met. The cycle of insecurities, self-doubts, and increased demands on the other continues to feed on itself.

Fortunately, one is not separated from a cat on the grounds of jealousy or alleged infidelity. Yet I personally confess that certain of my relationships with humans have not typically included the commitment I have to Mysti, and I have further lessons to learn in that area.

The Clinical Domain

The area of nonverbal communication offers a major intersection between animal and human behavior, providing a relevant source of information for practicing psychologists. An astute clinician or counselor will note and make use of

nonverbal communications in the course of an interview. Those therapists who utilize homework assignments often request clients to monitor their own emotional responses in addition to the occurrence of other target behaviors (e.g., eating, smoking, aggressive acts).

While the clinician may become quite adept at observing and processing nonverbal cues, his/her responses to such cues are often attributed to a sense of clinical intuition. Granted that intuition may involve observing events and drawing relationships or meanings between them. In addition, the development of this skill is ordinarily said to be a function of practice or experience. Yet the key factors in acquiring effective clinical skills are observing and listening.

It would seem to follow that practice in observing, listening, and responding to organisms might be fundamental to the graduate training of clinicians. In dealing with humans, for instance, an observer might be trained to discriminate the range and significance of nonverbals such as vocal tones, postures, gestures, facial expression, and use of space. We could also look more closely at the range of emotional expression and experience, the contexts in which they may occur, and cultural variability. Studies of other animals could further sharpen the student's observational skills in attending to minute details of subtle behavioral changes.

By examining these types of behavior, the observer might gain a perspective of other humans as mammals, as a particular evolutionary branch of primates, possessing a complex repertoire of responses and adaptive by means of its inherent specialization toward learning. Perhaps after studying some commonalities between humans and lower order animals, the student of human behavior can better appreciate the contributions made by classical behaviorists.

For instance, valuable data have emerged from basic experimental laboratories in terms of behavioral principles. The field of applied behavioral analysis utilized the basic principles through numerous programs in controlled settings (e.g., hospitals, schools, day care centers, smoking and weight loss programs). Effective therapeutic techniques such as desensitization and shaping also had their beginnings in basic research.

Yet there is a wide gap between counting lever presses and dealing with suicides, family feuds, or drug overdoses at a crisis intervention agency. Unless we have been trained to observe behavior and respond to emotional messages, our finely honed behavioral principles will prove dull instruments in the counseling arena.

A Wider Relationship

Domestic cats have been raised under conditions of dependence upon man (directly or indirectly, as in feral

cats) and have been genetically altered from wild ancestral types. The nature of man's relationship to the domestic cat can provide an interesting mirror for certain human values and tendencies.

The cat's usefulness to human society may have developed largely in terms of its hunting ability: protecting human commodities (e.g., stored grain, field crops, manuscripts in temples) from an overabundance of rodent predators (Fox, 1977). (Barn cats are still familiar characters on most farms.)

Cats have also proved economically useful in terms of pedigreed breeding. Whereas genetic variations in horses or dogs may produce an animal suited to hunting, racing, or pulling loads, I am not aware that any such functional variations exist among cats. However, certain breeds may typically vary in general temperament (e.g., the "shy" Abyssinian, the "sedate" Persian, the "attention-demanding" Siamese).

Another advantage of the cat in human society is its simple value as a companion. Its graceful beauty, playfulness, enjoyment of stroking, or silent presence may be alternatives to exclusively human society or raising children.

Every now and then I scan bookstores' collections of works on cats. There seems to be a trend in the past several years toward books on understanding and communicating

with domestic cats, most frequently by authors who have lived with cats. I see this as a fortunate tendency in that readers may expand their perceptions of cats as complex living creatures. In addition, readers may become more aware of the responsibilities of living with other creatures that have particular emotional, social, and psychological needs--whether this means sharing a home or the earth's ecological system.

Nonetheless, human management of this domestic species currently demonstrates an ironic set of values. On one hand, there are some breeders who are concerned only with variations in physical appearance (e.g., coloration and patterning, body type, length of coat, perfect representatives of a "type") and the profits that these offspring will generate. On the other hand, unwanted cats are allowed to proliferate and, along with dogs, overcrowd Humane Society shelters in our urban areas.

While the domestic population increases, the future looks considerably more bleak for other feline populations. The leopard, cheetah, jaguar, and ocelot, for instance, are listed as Endangered Species (Nisker, 1978).

The last wild Indian cheetah was sighted in central India in 1952, the Asian lion is reduced to a single small population in the Gir Forest, northwest of Bombay, and the tiger becomes legendary almost everywhere. Especially in India and Pakistan, the hooved animals are rapidly disappearing, due to destruction of habitat by subsistence agriculture, overcutting of the forests, overgrazing by the scraggy

hordes of domestic animals, erosion, flood-- the whole dismal cycle of events that accompanies overcrowding by human beings. In Asia more than all places on earth, it is crucial to establish wildlife sanctuaries at once, before the last animals are overwhelmed. As [George Schaller] had written, "Man is modifying the world so fast and so drastically that most animals cannot adapt to the new conditions. In the Himalaya as elsewhere there is a great dying, one infinitely sadder than the Pleistocene extinctions, for man now has the knowledge and the need to save these remnants of his past." (Matthiessen, 1978, pp. 11-12)

Whether the system is a relationship between two organisms, a controlled laboratory experiment, or the planet's ecological imbalance, the common denominator is interaction and exchange of information. As individuals, we are members of numerous systems (e.g., marriage, family, academic or political communities), and we choose to interact with various levels of these systems. Yet we also choose to disregard information which may be unpleasant or inconsistent with our previous data or value systems. As in my exploration of the cats, there is ever more to be heard and seen, questions which have no immediate resolution, and the potential for an expanded perspective of a problem's context. . .if we could learn, as King Lear, to "see better."

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APPENDIX:
A GUIDE TO THE LANGUAGE OF DOMESTIC CATS

The observations presented here offer a general range of the domestic cat's expressive repertoire. Individual cats may demonstrate variations of these patterns.

Postures

The concept of postures involves labeling patterns of behavior which are perceived visually. The pertinent topographical dimensions include (a) the relative movements and positions of various parts of the body (e.g., tail, paws, legs) and (b) general postural tonus, including spinal flexion and muscle contraction.

The functional component of specific behavioral patterns is reflected by labels such as offensive and defensive threats, broadside attack, and playful rolling. The cat's emotional response (e.g., fear, anger, affection) is inferred by the additional consideration of situational cues.

Orientation

In orienting itself toward the source of an auditory or visual stimulus, the cat appears alert: (a) it turns to face the stimulus, (b) it sits, stands, or lies with a moderate degree of visible tension, neither totally relaxed

nor aggressive, (c) the ears are erect or pointed forward, and (d) the cat remains still for several seconds before crouching or moving toward or away from the stimulus. At times, the ears may simply move in the direction of a sound if the cat is already oriented toward a visual stimulus in a different direction.

Crouch

The crouch is characterized by low postural tonus and hind legs tucked under the body. Two variations are observed: (a) the body is extended and horizontal with forepaws extended forward or (b) the back appears slightly arched, with raised hindquarters and "elbows" angled so that only the footpads rest on the ground. The tail, or only the tip, is lashed or waved from side to side. The ears are pressed back or pointed to the sides. The cat may growl intermittently, bare its teeth, and stare at a potential antagonist.

The crouch is observed in a number of situations including aggressive encounters, hunting, and play. This is also a typical response to being startled or frightened. Ordinarily, the crouch seems to operate as a transitional posture, preceding one of several alternatives: (a) leaping upon prey or another cat, (b) a stalking run, with the body close to the ground, (c) rolling onto the back, or (d) leaving the arena.

On-the-back

The basic posture of lying on the back is observed in a number of contexts; concomitant behaviors or gestures vary between certain situations. Rolling side to side is characteristic of the female estrous display, the catnip response, and the soliciting of play. I have observed my cats use this posture most often for two purposes: (a) desire for physical stroking by a human and (b) as a component of aggressive encounters. Kicking may occur during both defense and play. If the cat vocalizes, closed-mouth greeting patterns (chirp) accompany the solicitation of play or attention, while hissing is an unmistakable defensive factor.

Above all, lying on the back allows the cat to use all its claws. The only other position in which all paws are freed is that of leaping onto the back of an adversary or prey. From these positions, the cat can bite effectively at the opponent's throat or neck, respectively. A posture that allows full use of the weapons (teeth and claws) is highly adaptive, and the same essential strategy has been modified to fit both offensive and defensive requirements.

Arched back

Characterized by high postural tonus, the arched back postures are perhaps the two most easily recognized feline

communication patterns. The concomitant signals of each pattern are so distinct that misinterpretation of the cat's intent is highly improbable.

The cat in an amiable mood arches its back, rubbing its shoulders and body against a human, other animal, or furniture. The ears are erect, the tail held aloft, and the movements generally relaxed. Purring or soft murmurs are also noted. It is difficult to determine objectively whether the cat thereby demonstrates affection toward another organism or is merely seeking to be petted. Frequently, a cat about to be fed will behave in this way, vocalizing and rubbing against the owner's leg until fed.

In contrast, the arched back defensive threat includes hissing, the tail looped downward and to the side, pilo-erection along the spine and tail, ears laid back, dilated pupils, increased respiration, and muscular tension of the legs (giving a stiff, straight appearance). The cat approaches its adversary on a diagonal, presenting a lateral view of itself. This posture is observed in aggressive encounters with other cats and predators, particularly dogs. Through such a display of its size, the inherent message is that of attempted intimidation; while the cat is prepared to fight, it prefers not to and will often seek escape if given the opportunity.

Broadside attack

The basic stance of the broadside attack is the defensive threat posture. However, the cat approaches the intruder while there is still some distance between them. The cat gallops laterally toward the opponent, always presenting the side view with the tail held to one side. This strategy is typically effective in driving off the intruder (Lorenz, 1964).

This maneuver is observed primarily in two situations. First, the female cat with a litter of kittens may be ready to defend her brood with all the vigor of an offensive encounter. Second, kittens will use these movements in play fighting.

Face-to-face (Offensive threat)

The offensive threat occurs predominantly between two cats, frequently males, prior to battle. The opponents stand facing each other in a direct line, with bodies tensed for a sudden rush attack. Staring into each other's faces, they alternately hiss, growl, and wail. The pupils contract, and their tails may swish from side to side. They initially move toward each other very, very slowly.

This posture is maintained until fighting ensues or one cat defers and leaves the arena. Territorial considerations often influence which cat defers (Lorenz, 1964).

Tail

The information afforded by observations of tail movements pertains to general patterns of arousal.

According to Kiley-Worthington (1976),

tail movements are usually only components of the total posture which may have communication value, without having necessarily evolved to serve as a signal. . . [I]t is necessary to consider the whole posture of the animal as well as the contexts that give rise to it. (p. 70)

As an extension of the vertebral column, the tail reflects spinal contours while also functioning as an aid in balance.

Lateral movement

The side-to-side movements may be rapid or relatively slow, involving the entire length of the tail or only the tip. I observed these responses under a variety of conditions: (a) prior to leaping from a crouched posture, (b) while being petted, (c) in orientation toward moving stimuli, and (d) while resting. Movement of the entire length of the tail seems correlated with a preparation to move (e.g., running or pouncing) and orientation toward moving stimuli.

Postural concomitants

As part of the defensive threat and broadside attack, the tail is looped downward from a slightly raised base and

held to the side facing the opponent.

As the cat canters or gallops, the tail is also hooked downward. In contrast, the tail is usually held aloft during a trot. While walking, the tail may be held vertically or horizontally. When exhibiting the friendly arched back posture, the tail is held vertically.

At times, the tail will curl against the cat's body. This usually occurs when the cat is in the crouched position, with all paws tucked under its body, and as it lies in a curled position on its side. Occasionally, the tail will curl against the body, with the tip covering the forepaws when the cat sits on its haunches. The tail may also be drawn around the body during the defensive crouch, giving the appearance of a protective response to fearful stimuli.

In general, elevated tail positions correspond to moods of confidence, happiness, or contentment. Lowered tails typically are correlated with fear, fatigue, or depression.

Eyes

Directionality

Cats readily attend to a moving object in their visual field by focusing on the object and following it visually. The direct gaze can indicate the source of the cat's interest or the intended recipient of its message, such as a human from whom it desires some response. At other times,

a direct stare may indicate disapproval or anger. Prolonged, direct stares among mammals generally imply some hostility, disapproval, or potential aggression; in turn, the recipient of the stare experiences nervousness or anxiety.

Pupil size

During the normal waking state, the pupils ordinarily appear elliptical. The pupils widen in response to a decrease in available light and likewise become narrower under increased light. The eyelids are usually fully opened, giving the eye a round appearance. The eyelids may be partially closed when the cat is drowsy or when it looks disapprovingly at another organism.

Under certain conditions, the pupils dilate regardless of the amount of available light. The pupils then become so wide and round that the iris forms a relatively narrow outline around the pupil. In general, any high level of excitement, arousal, or readiness to move correlates with large pupil size. These situations include play, anticipation of favorite foods, fear, and aggression.

Ears

Erect

When the ears are erect or pointed forward, the cat is usually oriented toward some aspect of its environment.

Typically, the cat responds in this manner to sound or movement. At other times, the ears will orient toward the direction of auditory stimuli. The cat may turn and face the source of sound or merely point an ear toward the source.

Pointed sideways

As the ears move downward and sideways, the cat becomes increasingly cautious and suspicious. Like the crouch, this appears to be a transitional movement. Uncertainty, frustration, or irritation at some disturbance may be indicated by holding the sideways position or intermittent flicking movements. "A slight folding back takes place when the cat is anticipating something unpleasant--a swat from another cat or human or something as innocuous as a scolding" (Necker, 1970, p. 134).

Drawn back

The ears drawn back and lying flat are observed in play, attack, and defense. This appears to be a protective response, perhaps minimizing an adversary's opportunities for bites to the ears. The ears are also laid back as a means of protecting the inner ear from sharp sounds or to keep from touching an object in passing (Necker, 1970).

Forehead

Appearance

The forehead can appear smooth and clear or furrowed as in primates. Relatively smooth facial muscles are the norm, observed while resting, in play, and non-aggressive situations. The "furrowed brow" of an irritated, angry, or suspicious cat correlates with partially closed eyes and ears pointed sideways.

Rubbing

A familiar expression of amity toward humans or other animals is that of forehead rubbing. Ewer (1968) observes that a cat may also rub its lips and chin against a human's face as a social greeting, "and in its natural context this behavior is related to courtship, rather than to territorial marking" (p. 111). This behavior often occurs in conjunction with the friendly arched back posture and is ordinarily followed by immediate physical contact.

Vocalization

Murmur patterns

These sounds are produced with the mouth closed and generally reflect satisfaction or amiability.

The vibrations and sounds of purring are produced by

a regular, alternating pattern of activity involving the diaphragm and intrinsic laryngeal muscles (Remmers and Gautier, 1972). As these authors also note, purring occurs when cats interact "with other friendly organisms" (p. 360). Most of my observations of purring contain the element of physical contact. That is, the cats may purr when stroked, scratched gently, or simply lying on my lap.

The sound which I call a chirp is markedly louder than the purr, of one or two seconds duration, with a slight increase in pitch at the end of the pattern. Moelk (1944) notes that this sound resembles a purr, yet is not composed of the distinctive vibrations which characterize purring. It may be emitted as a greeting, in play, in anticipation of a desired tidbit or acknowledgment, and even as a question.

In particular, Mysti may use the greeting in several situations: (a) when I enter the apartment or room where she happens to be, (b) when I am in a room she enters, (c) if she approaches a person for some purpose, and (d) as a response to my greeting or call.

Vowel patterns

These are produced with the mouth initially opened and then slowly closed ("Meow"). The range of messages includes: (a) request or demand, (b) begging, and (c) complaint and refusal.

Request and demand patterns may be emitted when the cat desires food, play, physical contact, access in or outside, and rousing a person's attention from sleep or other preoccupation. Begging consists of an initially prolonged pattern which may increase intensity to an insistent cry. Refusal patterns are low, wavering sounds bordering on a snarl and can typically occur in situations that involve unwanted handling or attention from humans or other organisms.

Cats emit a curious modification of the vowel pattern under very specific conditions. The mouth alternately opens and closes quite rapidly; the voiced column of air combines with quick movements of the mouth to produce a sound that resembles the chattering of squirrels or raccoons. Such chattering occurs in the presence of unobtainable prey (e.g., flies, birds) separated from the cat by a window or distance. While the pattern is not consistently emitted each time these conditions are present, it may nonetheless be an expression of frustration.

Strained intensity

The sounds of hissing, growling, and snarling are produced with the mouth held tensely in certain positions. The mouth is noticeably open during the hiss, which permits a threatening view of the teeth. Hissing is typically observed as a correlate of defensive threat behavior, as a

warning to an organism intruding on the cat's space. Regardless of the relative size or strength of the opponent, this defensive pattern will be demonstrated in situations where the cat's space, person, or social status are challenged, revealing both fear and a readiness to fight if removal of the aversive stimulus is impeded.

In growling, the mouth appears to be closed, producing a throaty grumble. Snarling is more prolonged and varied in tone than the growl, yet both sound similar and generally occur in offensive aggression. Where hissing implies fear in a potentially threatening situation, growling suggests increased irritation and self-confident anger.

Although hissing and growling are typically correlated with defensive and offensive aggression, respectively, a cat may alternate both sounds during an interaction, implying "mixed motivation."