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Improper Puppy Socialization and Subsequent Behavior

by
Donald D. Draper, D.V.M., Ph.D.*

INTRODUCTION

All too frequently dog owners and small animal practitioners are confronted with canine behavior problems. These problems may include the dog that is a fear biter, the frigid bitch that will not accept a male, the submissive urinator, the untrainable dog, the dog that bites children and a host of other abnormal behaviors. Behavioral disorders may be due to organic problems, psychosomatic illnesses, or improper treatment and rearing. Another cause of many adult behavioral disorders is the lack of proper socialization of the young dog in early life. Since the socialization of the young dog has such a remarkable influence on subsequent adult behavior patterns, it is important for the dog owner and the veterinarian to be familiar with the normal socialization process. In addition, a knowledge of the socialization process often provides insight into the possible causes or sources of deviant behavior. Finally, an understanding of the socialization process and the development of behavior provide us with information on the proper methods of rearing young puppies so that adult behavioral problems can be avoided. Because of these reasons, this article will review the current information on the normal socialization process of the dog and will provide information on the effects of improper socialization on behavior.

THE SOCIALIZATION PROCESS

The ethologist uses the term primary socialization to refer to the process whereby the young puppy forms primary social

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attachments or relationships with other organisms, including human beings (8). These social relationships change as the puppy matures and are associated with four distinct periods of behavioral development. These periods are called the neonatal period, the transition period, the socialization period, and the juvenile period (10). Each of these periods is closely related to the structural and functional changes that are occurring in the nervous system of the puppy as it matures. The behavior of the puppy in each of these periods will be examined.

Neonatal period. In most breeds of dogs, the neonatal period lasts for the first two weeks of the puppy's life. During this period, the puppy has social interaction with its mother and limited interaction with its littermates. The puppy is essentially completely dependent upon the mother and therefore most of the mother-puppy interactions are concerned with warmth and nourishment. Neurologically this is to be expected in that the neonatal puppy lacks many of the sensory and motor capacities that are necessary for more complex social activities. The newborn puppy has a poor sense of smell and is functionally deaf and blind. Its total sensory capacities consist of touch and thermal sensations. Its motor activities are limited to crawling, suckling, and distress vocalization. Thus, because of the limited sensory and motor capabilities, the puppy's social behavior patterns are lacking or minimal. The social interactions that are observed in the puppy consist of its attempts to find food from the mother or to seek warmth from either the mother or the littermates. The newborn puppy exhibits preliminary exploratory behavior in the

slow crawling movements when it turns its head from side to side. This response is usually observed when the puppy is trying to find the mother's nipple. The puppy is guided to the nipple by its ability to perceive the warmth of the mammary glands. The puppy's ingestive behavior is limited to sucking. Its eliminative behavior occurs only in response to abdominal or anogenital stimulation by the bitch. All other social interactions of the puppy are achieved through care-seeking behavior. If the puppy is hungry, cold, or hurt, it will emit a rapid series of whines until it is comforted by the bitch or caretaker.

Transition Period. The third week of the puppy's life consists of the transition period, characterized by the change from the neonatal period to the beginning of sensory, motor and psychological capacities associated with adult behavior. There is a transition from a state of complete dependence upon the mother to a state of relative independence. During this time, the puppy begins to respond to auditory and visual stimuli due to the maturation of the auditory and visual receptor organs. The puppy is more aware of its environment and begins to explore it intensely and deliberately. The motor divisions of the nervous system have matured to the point that permit the puppy to stand, walk, and chew. The puppy's learning capacities change and by the end of the transition period, some of the rudiments of adult social behavior patterns can be seen. The three week old puppy, for example, will wag its tail at the sight of people or other animals. It will also begin to exhibit play activities with its littermates in the form of biting, chewing, and pawing on its peers. The puppy can now defecate and urinate on its own and will eliminate outside of the nest area. To summarize, the puppy has undergone a rapid transition from the neonatal state of total dependence upon the bitch to a state of recognizable adult behavior patterns.

Socialization period. Although limited social interactions have occurred during the first three weeks of a puppy's life, the most important social relationships and attachments form after this time (10). The socialization period extends from the fourth week of life through the twelfth or four-

teenth week. This behavioral period is probably the most important period in determining the adult behavior of the young dog. It is during this time that the puppy acquires nearly all of the adult sensory, motor, and learning abilities.

It is in this time-limited behavioral period that the experiences of the young puppy will have their most dramatic effect on the ultimate adult behavior. For this reason, some scientists refer to the time period as the critical or sensitive period of socialization (7). More will be said about this after the normal behavior of the socialization period is discussed. Initially, the puppy's behavior is related to care-seeking activities including its search for comfort, warmth and food. It forms a strong attachment to the bitch. It will try to follow the bitch as she moves around the pen. It may exhibit distress calls when isolated for brief periods in a strange place. Usually the puppy will show a fear response to strange objects or people during the early part of the socialization period. This is illustrated by the puppy growling, trying to hide, or attempting to run away. During the socialization period, the ingestive behavior of the puppy begins to change. The puppy will begin to lap up and drink liquids and chew solid foods. The appearance of teeth at this time aids in chewing and also plays a role in the development of aggressive behavior. This can be observed in the playful fighting activities of puppies characterized by chewing and biting on one another. They frequently will growl at one another in mock battle play or in competition for food and play objects. The competitive behavior displayed at this time is important in establishing the litter social hierarchy. The dominant aggressive puppies can be distinguished from the timid submissive puppies. Another social activity that begins early in life is pack behavior. If one puppy leaves the home area of the pen and begins to explore, other puppies usually will follow. If the caretaker steps into the pen, all of the puppies will run to him or her for attention. During the early part of the socialization period, a puppy will begin to explore and investigate its environment. It usually approaches strange objects cautiously and may even give a little startle response. As the puppy

becomes accustomed to its new environment, it will range farther from its pen. The apparent desire to range and explore is also seen in the puppy's eliminative behavior. Early during socialization, the puppy will urinate and defecate close to its nest. Gradually it will go farther from the nest and eliminate in specific spots. When the puppy feels the urge to defecate, it will run to an area, wander around with its nose near the ground, and then circle rapidly before defecating. Although not recognized by most pet owners, this is an ideal time to house break a puppy. The procedures used to "toilet train" a puppy at this time will have a permanent influence on its adult eliminative behavior.

As the socialization period precedes, there is a gradual change in the social interactions of the young puppy. During the fourth week of life, the puppy interacts primarily with its mother and to a limited extent with its littermates. Ethologists refer to this brief time period as a sensitive period of socialization to the mother. Apparently the mother-puppy interaction permits the puppy to learn about caregiving behavior even though it may be months before it exhibits this type of behavior as an adult. This time may be very important to female puppies as they may learn some of the behavioral activities appropriate to maternal care. Severe emotional or social stresses at this time apparently have a lasting effect on the puppy. The way in which the bitch or human caretaker responds to a puppy's distress vocalizations and general behavior may determine how the puppy reacts to stressful situations in later life (10). The period of socialization to the mother is very brief. By the time the puppy reaches five weeks of age, it begins increased social interactions with its littermates, observed in play behavior, running together, and in fighting behavior. This type of behavioral activity is seen through the seventh week of life, and is referred to as the sensitive period of socialization to peers (4,10). Through its interactions with peers, the puppy learns that it is a dog. This may seem to be a strange thought from the human viewpoint, however, puppies isolated from their peers or other dogs during this time

will usually have difficulty socializing with other dogs in later life. Frequently they will not exhibit normal adult behavior patterns. This can be seen in the dog that acts aggressively toward all other dogs. Isolation from peers at this time may also interfere with adult sexual behavior (1). A female raised in isolation from conspecifics may be unwilling to accept a male. A male raised in isolation may not know how to react to a female in estrus. Although these may be extreme reactions, they are not that uncommon and therefore dog breeders and veterinarians should understand these abnormal sexual behaviors if they occur.

Coinciding with the time of socialization to peers is an increasing responsiveness on the part of the puppy toward human beings. The relationships with humans usually begin around six weeks of age and extend for variable periods of time. Most work indicates that the maximum capacity for socialization to man occurs from six to eight weeks of age (4) and may extend to twelve weeks. This has several important functional and practical considerations. It is at this time that the bitch normally weans the puppies so they become more independent. It is also at this time that the puppy's nervous system has reached the structural and functional capacities of the adult. The puppy is ready to learn and will do so quite readily if properly handled. The time between six and eight weeks of age is thus an ideal time to place puppies in new homes so that further socialization to humans and training can occur. Unfortunately, this is not done often enough by dog breeders nor do potential pet owners realize the importance of obtaining a puppy at this time.

Summarizing the socialization period, it is one in which the puppy has many interactions with its environment and forms many new social relationships. These relationships can generally be divided into three sensitive periods—socialization to the mother, socialization to peers, and socialization to humans.

Juvenile period. This period extends from the twelfth week of age to the time of sexual maturity (10), the duration depending upon the breed being considered. The further socialization of the

young dog and its behavioral activities during this time will depend to a large extent on its environment. The young dog that matures and grows in a human family environment develops much differently than the dog that is left in a kennel to mature. In either environment, the most important process during this time is that of achieving social independence (9). In a sense, the young dog must learn to survive by itself. During the juvenile period the young dog will try to establish its dominance either to other dogs or to humans. This is extremely important for a new pet owner to understand. The new puppy in a home normally becomes a part of the social organization of the family. Usually, it will try to become the dominant individual or alpha animal in the family pecking order. This is a common time for behavioral problems to occur. The puppy that is not trained and disciplined at this time soon becomes aggressive and destructive. Carpets are chewed, chairs are destroyed, drapes are torn, doors are broken, and many other obnoxious things occur. These events are frequently followed by a trip of the novice and uneducated owner and his pet to the city pound, dog shelter, or the country road. Unfortunately, this happens all too frequently and contributes to the large number of unwanted and feral dogs in urban and rural areas. This is not necessary. If the new pet owner understands that the young dog will constantly test him or her, they can alleviate many of these behavioral problems. The new pet owner must establish dominance over the dog and must make it clear to the dog through training that it must play the game according to the rules of the family. Any other alternative usually leads to disaster.

EFFECTS OF ISOLATION ON SOCIALIZATION AND SUBSEQUENT BEHAVIOR

Although it is important to understand and know the basic behavioral development of a dog, it is equally important to know how alterations of the normal socialization process will modify subsequent behavior. The term critical period becomes meaningful in this context. A critical period

is a time in the puppy's life in which many or all aspects of its behavior are particularly susceptible to modification (2). Simply stated, it is the time when the early experiences of the puppy will have the greatest effect on the subsequent adult behavior of the dog.

Most of the information on critical periods and the socialization processes comes from data gained from isolation experiments. Isolation may consist of no contact with humans (4) or no contact with other dogs (3) during the period of socialization. In the extreme form there may be no contact with humans or dogs coupled with complete sensory deprivation (5). Some of the findings from these studies will be presented to illustrate the importance of the socialization process. Hopefully they will be similar to cases the reader has encountered but did not understand.

Freedman, *et al.* (4), in a series of experiments have shown that if dogs are reared together and are denied human contact until after twelve weeks of age, they show a strong avoidance of human beings and are literally undomesticated. Puppies that received human contact between four and ten weeks of age developed social responses to their handlers as well as to other human beings. By varying the time of socialization to man, these investigators were also able to demonstrate that the optimum time for socialization is from six to eight weeks of age. In other words, puppies that are socialized between six and eight weeks of age respond to human beings much better as adults than do puppies that are socialized before or after this time. Further, puppies that did not receive any socialization to man were essentially unapproachable and untrainable as young dogs and as adults. Although these findings come from an extreme form of isolation, many similar types of isolation are occurring continuously, particularly in large kennels with inadequate help. As a result many young dogs are sold that are and will be difficult to train.

In a different type of isolation experiment, Fox and Stelzner (3) reared puppies by varying the degrees of socialization to their own species. These investigators used three different con-

ditions: (1) hand reared pups which were socially isolated from peers from three days to twelve weeks; (2) pups weaned at three and one-half weeks and socially isolated until twelve weeks; (3) pups weaned at eight weeks and socially isolated until twelve weeks. A series of behavioral tests were instituted following the period of isolation for all three groups. The greatest deficits in social behavior and in reactions to conspecifics were exhibited by the hand reared pups. The puppies weaned at eight weeks showed the greatest interaction with their peers and the early weaned pups were intermediate in their reactions to peers. All puppies showed similar social responses to human beings. The hand reared puppies showed the greatest changes in behavior when placed with other puppies at twelve weeks of age. They were nonvocal, nonoral, nonaggressive, and passive with peers. They rapidly became aggressive toward their peers following socialization and rarely engaged in group play. They tended to wander off alone and engaged in self play or manipulated inanimate objects. Some of the hand reared puppies became aggressive enough that they became dominant over their peers. Although the hand reared puppies were socially attracted to human beings, they did not show the affection toward humans that is normally seen when puppies are socialized to humans. Thus this form of isolation also demonstrates the importance of early social experience on subsequent development of behavior and social relationships. Similar results have been obtained by anyone who has tried to raise an orphaned puppy. As an adult, they usually have trouble getting along with other dogs and frequently are not friendly toward other human beings other than their owner.

A more severe form of isolation has been studied by Melzack (5). This investigator raised puppies in isolation cages which prevented contact with humans, peers, and also drastically reduced sensory inputs. Puppies that were raised in this form of isolation during the socialization period showed some bizarre behavior patterns when released from isolation cages. The puppies tended to freeze and creep along the floor of their pen. As they became acquainted with their new environment,

they became increasingly active, until their general level of activity exceeded that observed in their control littermates. The high level of behavioral excitement was increased by almost anything new in their environment. The peak of the excitement was often manifested in the form of whirling fits. The fits were usually driven by excessive stimulation but were also observed to occur spontaneously in some dogs. In some cases the fits were so severe that the dogs would crack their tails or break the skin of their heads against the walls of their cages. This extreme form of isolation has drastic and irreversible effects on the later behavior of the adult.

Early socialization is also important in dogs that are destined to become working dogs. This has been demonstrated by Pfaffenberger and Scott (6). These workers studied the effects of delayed socialization on the trainability of guide dogs for the blind. In this experiment, all puppies received a limited amount of socialization to humans for the first twelve weeks of life, then were placed in private homes at variable times. Some puppies were placed immediately at twelve weeks of age, others were isolated for one, two and three weeks respectively before being placed in private homes. Of those puppies that were placed in private homes at twelve weeks of age, ninety percent became guide dogs. When similar puppies were isolated for two weeks following the initial twelve weeks of socialization, only fifty-seven percent were successfully trained as guide dogs. Further, if puppies were isolated for three or more weeks, only thirty percent of the dogs were successfully trained. One can conclude from these results that social deprivation after the critical period of socialization may result in the young dog becoming asocial and thus essentially untrainable. This frequently occurs in large breeding kennels, when puppies receive a lot of attention in early life but are then placed in the kennel to mature, thus receiving less human contact and exposure to the outside world. The author has seen this in hunting dog kennels where it is common practice to let the dog mature before training is begun. Most of the dogs that are raised in this manner may make decent hunting dogs, but they tend to hunt for themselves and

pay little attention to the handler. Some dogs that are reared in this way develop a syndrome called kennelosis (11). They exhibit timidity and will run from strangers. They may in fact show fear responses when someone tries to catch them. It would appear that social and exploratory behavior are affected and that frequent reinforcement of the social attachments during the critical period of socialization is important in maintaining the social bond.

On the basis of the findings of these and other experiments, one can state with some assurance that there is indeed a critical period of socialization for young puppies. If the puppy is denied this experience, it will have lasting effects which may severely alter the normal adult behavior of a dog and render it incapable of forming the appropriate social bonds to either human beings or conspecifics. Hopefully, dog breeders will become increasingly aware of the critical period of socialization and will raise litters of puppies in such a manner that proper socialization can occur. Likewise, it is hoped that veterinarians will become acquainted with normal behavioral periods of development so that they can advise their clients accordingly on proper rearing practices and management. If this is done conscientiously, it will undoubtedly reduce the number of maladjusted dogs and dissatisfied pet owners that are observed in society today.

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