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Pay Attention! Can the Type of Interaction between Handler and Dog Preceding an Agility Run Affect a Dog's Attention during a Run?

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Jillian Faustino is a senior psychology major at BSU. She conducted her research with funding with a 2010 ATP Summer Research Grant. She worked under the excellent mentorship of Dr. Amanda Shyne, and is thankful for her effort and guidance. Jillian plans to continue her research on animal behavior during the spring 2011 semester and is graduating in May. After graduation she plans to pursue a Ph.D. in comparative or evolutionary psychology.

There has been an increase of interest in investigating human-dog interactions in recent years. One area of interest for dog owners and animal behaviorists is how interactions and play between humans and dogs affect performance on object choice and detour tasks (Rooney & Bradshaw, 2002, Rooney & Bradshaw, 2003, Schwab & Huber, 2006, Pongracz, Miklosi, Timar-Geng, & Csanyi, 2004, Call, Brauer, Kaminski & Tomasell, 2003). Previous research has suggested that play (a pleasurable game or activity which involves both humans and dogs, such as tug-of-war or fetch) is a very important part in a dog's social, cognitive and motor development (Ward, Bauer & smuts, 2008, and Bauer & Smuts, 2007). Also, dog behaviorists have suggested that different types of play can affect dimensions of the dog-human relationship such as dominance, submissiveness, involvement, motivation, avoidance behaviors and aggression (Rooney & Bradshaw, 2003, Toth, Casci, Topal, & Miklosi, 2008). In addition human behavior, such as human attention and how humans interact with dogs can also affect dog behavior such as their obedience and performance in a game situation task (Call, et al., 2003, Schwab & Huber, 2006, Gasci, Mkiklosi, Varga, 2004). In general, human and dog interactions, and human and dog play can effect dog behavior.

Also, another way humans can affect dog behavior is by their attentional state. An attentional state is defined as the length of time a human's gaze and/or body is oriented toward the dog. Call, et al. (2003), investigated whether domestic dogs were sensitive to attentional states of humans. The results showed that dogs took significantly less food pieces, when told not to, when the experimenter was looking at the dog than when the experimenter was not looking at the dog. In addition when dogs took food when the experimenter was looking at them the dog used an indirect route to reach the food or crawled toward the food. This suggests that the dogs were still aware that the experimenter was looking at them because the dogs were more cautious to take the food. Overall this study supports that the level of attention a human gives toward a dog can affect how a dog behaves. In another similar study Schwab

& Huber (2006), looked at how the attentional state of an owner affected their dogs' behavior. They found that dogs got up from the lay down position quicker when their owner told them to lie down and then did not look at the dog compared to an owner who was looking at their dog and commanded them to lie down. This indicates that dogs are aware of their owner's attentional state based on human communication cues such as eye contact and body orientation. Dogs whose owners were more attentive showed more obedient behavior than dogs with un-attentive owners. In addition another study examined whether dogs are capable of perceiving the attentional state of a human in different contexts, showed similar results (Gasci, et al., 2004). The findings of this study indicated that dogs performed better at game situations such as fetch and retrieval when their owner was facing towards them and not blindfolded than when the owner was facing away and had a blindfold over their eyes. In addition dogs were more likely to beg from a person who was gazing at them, than a person who was not gazing at them. Overall the results show that dogs are able to rely on facial cues as communicative signals of attention, which suggests that dogs are able to assess the level of attention in humans.

Furthermore, dog dependency on their owners' behavior and communicative signals and a dog's previous training can also affect dog behavior and performance on a task. In studies by Gaunet (2008, 2010) it was found that guide dogs of blind owners and pet dogs of sighted owners ask for food and for toys/play with similar behaviors. Both pet dogs and guide dogs gazed at their owner more often than other behaviors such as, physical contact (pawing at the owner), vocalization, mouth licking, and sonormous mouth licking (mouth licking with a loud noise). This result suggests that gazing at the owner is important for dog and human interactions and communication. Although gazing at the owner for communicative signals may be important to all dogs, one study suggests that this behavior is found more often in agility dogs (Marshall-Pescini, Passalacqua, Barnard, Valescchi, Prato-Previde, 2009). In the study they investigated how different training can affect a dog's behavior in a socio-cognitive task. The authors specifically looked at the difference between agility and rescue dogs. The results showed that agility dogs looked longer and more often at their owner than rescue dogs and dogs that had no specific training. In addition agility dogs only looked at their owner, while untrained and rescue dogs looked at the experimenter and their owner for almost equal amounts of time. The findings of these studies suggest that different training backgrounds and dog dependency on their owners' behavior and communicative signals can affect how a dog behaves in a socio-cognitive task.

Dogs have lived in cohabitation with humans for over 100 thousand years, and so it is believed that through this evolutionary process, dogs and humans have developed a unique relationship, and that dogs have a more enhanced ability to understand human behaviors and communicative signals compared to horses, primates and wolves (Udell, Dorey, Clive, Wynne, 2010, Mckinley, Sambrook, 2003, Topal, Miklosi, Csanyi, 1997). Pongcracz et al. (2004) found that certain types of communication affect a dogs' performance on a detour task. Results showed that verbal communication and having a dog learn from a human demonstrator were more efficient at getting the dog to the target than not having a human demonstrator and using hand signals (pointing) from a human. This suggests that dogs are able to infer directional cues from a human, which may indicate that humans and dogs are able to understand one another's communicative signals. An earlier study done by Pongracz, Miklosi, Kuybinyi, Gurobi, Topalt, and Csanyi, (2001), looked at the effect of a human demonstrator on the performance of dogs in a detour task. The results showed that dogs completed the detour in significantly less time when the dog observed a human demonstrator complete the task than when the dog did not observe a demonstration. Therefore this suggests that human behavior or demonstration can affect a dog's performance on a specific task. Thus because dogs are able to learn from human demonstration it can be inferred that dogs are sensitive to human behavior. Another study examined the comprehension of human communicative signs in dogs (Soproni, Miklosi, Topal, Csanyi, 2001). The results showed that dogs performed better when the human directed the dog at the target by pointing directly at the target, then when the human glanced at the target or when the human pointed above the target. This indicates that dogs are sensitive to the attentional gestures of humans, and can differentiate between different human communicative signals.

Feeding techniques and enrichment have also been shown to affect learning abilities in dogs. A study by Gaines, Rooney, and Bradshaw (2008), looked at the effect of enrichment feeding on the working ability of kenneled working dogs. Enrichment feeding is defined as implementing a device or toy that a dog plays with or uses to attain food, for example a ball with food inside. The results showed that over time dogs with feeding enrichment increased in their ability to learn new commands from being rewarded. This suggests that a dog's ability to learn new commands can increase over time with feeding enrichment and this ability is a desirable trait for a working dog, or an agility dog. This study shows that feeding enrichment can be used to increase working ability in dogs.

As well as feeding enrichment, dog and human play has also been found to affect dog behavior. Toth, Gasci, Topal and

Miklosi (2008), examined the factors affecting the individual differences in the behavior of dogs playing with humans such as; the familiarity of the playing partner, the type of game, the daily active interaction between owner and dog, gender, age, and breed. Their results showed that dogs who received more playful interactions with their owners showed less fear and avoidant behaviors during play in an unfamiliar place than owners who did not play with their dogs as often, and also these dogs showed stronger motivation to play tug-of-war than dogs who did not play with their owners as often. In another study, Rooney and Bradshaw (2002) found that dogs who were considered more playful achieved higher scores on involvement and attention seeking when they won a game of tug-of-war (gaining possession of the object being tugged) with their owner in contrast to when they lost (losing possession of the object being tugged) a game. This implies that play is rewarding for a dog and can affect other dimensions of dog behavior such as involvement and attentiveness. In a later study, Rooney and Bradshaw (2003) looked at the link between play and dimensions of attachment or dominance regarding dog and human relationships. They found that dogs that played rough and tumble games (tug-of-war, smacking/wrestling the dog) scored significantly lower for separation related behavior than dogs that did not play the rough and tumble game. In addition dogs that played tug of war scored higher for confident interactivity and involvement during the game than dogs that played any other game, which suggests that playing tug-of-war with a dog increases their involvement. This implies that dogs that play tug-of-war are more involved with their owner during these play sessions, which could cause them to be more attentive during a performance task immediately after the play session.

Furthermore, types of human and dog interactions can also be helpful for dog training, such as training dogs for agility. An agility trial is an obstacle course that a dog must complete in a particular sequence. There are many different obstacles they must complete such as: running through a tunnel, jumping over various heights of bars, completing contact obstacles such as a dog-walk and weaving around poles. Handlers and their dogs come to these agility trials to compete with other handler and dog teams to see how fast and efficiently they can complete the obstacle course. Many handlers at agility trials take into consideration that how they interact with their dog before a run can affect how their dog performs during the run. Two of the most common types of interactions seen between handlers and dogs at agility trials are either feeding or playing tug-of-war to attain their dog's attention (Shyne, A., personal communication, June, 2010). The current study seeks to investigate these interactive behaviors and how they affect their dogs' attention during the agility trial run. Previous research has shown that agility dogs are more attentive and dependent on their owner for communicative signals, which indicates that dog attention toward their handler is a key component in agility training (Marshall-Pescini et al. 2009).

The current study will examine how human and dog interactions can affect a dog's attention in a performance task, specifically an agility run. I hypothesize that there will be a positive correlation with handler attention level before the run and dog attention level during the agility run. I also hypothesize that the type of interaction (tugging or feeding) will affect the dog's attention and performance in the run. There has been no previous research investigating how human-dog interactions affect a dogs' attention in a performance task, which makes the proposed research significant within the field of Psychology and animal behavior research. The implications of this study may be useful to dog owners who are training their dogs for agility trials, and may also have broader implications on efficient ways to train service dogs, or drug dogs. Overall this study will aid in further understanding of how animals and humans interact with one another and how these interactions can better help humans understand dog behavior.

METHODOLOGY

Subjects

The subjects in this study include handlers and their dogs competing at agility trials in Massachusetts, Rhode Island and Maine. Pairs (handler and dog teams) in novice and open levels were observed and videotaped at three different agility trials; Granby, MA on May 29, 2010; Westford, MA on June 6, 2010; Cumberland, ME on June 26 and 27, 2010; and Northsmithfield, RI on July 24, 2010. Teams run in a predetermined order, and there is only one team in the ring at a time, so every other pair of handler and dog was selected to be observed. This was done so that there was an ample amount of time for the researcher to write down a few notes on each team. The pairs next in line were easily distinguished because they were lined up near the entrance gate to enter the ring, therefore easy to spot and videotape. There were a variety of breeds observed of all different ages and sizes. No personal information on the handler was recorded, because this information was difficult to obtain accurately and also because it was not relevant to the study.

Procedure:

Naturalistic observations were taken at the agility trials during the summer months in Massachusetts, Rhode Island and Maine. At each trial there were three levels of difficulty: novice, open and excellent. However, novice and open were the only levels observed because dogs in these levels are less experienced

and are more prone to lose their focus on their handlers, while excellent dogs are very experienced and less likely to lose focus on their handlers (Shyne, A., personal communication, June, 2010). In addition there are three different types of courses, jumpers, fast and standard. Jumpers and standard courses are ordered obstacle courses which the judge designs and the handlers must negotiate with their dogs by communicating a specific route using verbal commands and hand signals. A fast course is an unmarked obstacle course during which each handler designs and runs in their own sequence by communicating with their dog using verbal commands and hand signals. During each team's run the following data were recorded: breed, level (novice or open) and the type of course (standard, jumpers or fast). Each team was taped between 30-80 seconds immediately before they entered the ring and the video clip was ended when the dog completed the last obstacle or when the buzzer/whistle sounded. Videotaping continued in the same sequence after the next dog had finished the run (this was to save battery power). After the agility trials the remaining observations on human attention, dog attention, and human and dog interactions were done by watching the video clips taken at the trials.

Type of Human-dog Interactions

Before each team's run the type of interactions that were observed and recorded were tug-of-war, feeding, other and none. Tug-of-war was when the handler plays tug-of-war for ten seconds or more during the time observed, and consists of the dog and handler tugging at each end of the rope simultaneously. Feeding was when the handler feeds the dog treats for ten seconds or more, before they run the agility course. Other was when the handler interacted with their dog in other ways than tugging or feeding for more than ten seconds during the time observed, such as, petting, talking to their dog, or playing touch (when the handler holds out their hand and commands the dog to touch it by jumping up and putting its nose to their hand). And lastly, none was when the handler does not engage in any type of interaction with the dog for the duration of the time observed.

Human Attention

Before the run the handler's attention level, low or high, was also recorded. Low human attention was when the handler made little or no eye contact with their dog (fifteen seconds or less). High human attention was when the handler made frequent eye contact with the dog (sixteen seconds or more).

Dog Attention

During the agility trial the dogs' attention towards the handler was observed and recorded. It included high, medium and low dog attention. High dog attention was when the dog looked at the handler for the duration of the course and/or was following the handler's directions for the duration of the course. Medium dog attention was when the dog lost focus on the handler once or twice during the run, and/or the owner had to call the dog back to the course. Low dog attention was when the dog lost focus on the handler more than twice during the run, and/or the handler was not able to call the dog back after it lost focus.

Tugging Sample

Because there was a small sample of handlers tugging with their dog before the run further measures were taken to increase the sample. At the agility trial in Northsmithfield RI, I waited at the entrance and exit of each ring and approached handlers and told them I was doing research investigating handler-dog interactions. I then proceeded to ask them if they could tug with their dogs about a minute before entering the ring, and if their dogs did not tug that was fine. At this particular trial videotaping handler-dog teams that were tugging was the main focus. Therefore videotaping only occurred if handler-dog teams were tugging, and after they had finished their run the next team in line was also videotaped to keep data as equal as possible.

RESULTS

Human-dog interactions and dog attention levels

A three-way contingency table analysis was conducted to evaluate whether dog attention levels during the run were contingent upon human-dog run interactions before the run. The two variables were human-dog interactions before the run with four types (tugging, feeding, other, and none) and dog attention level during the run (low dog attention, medium dog attention, and high dog attention). A 4x3 contingency table analysis between dog attention level and human-dog interactions was found to be statistically significant, Pearson X^2 (6, N=147) = 20.857, p = 0.005, Cramer's V = 0.266. Individual comparisons were calculated as 2x3 contingency table analyses to investigate which groups were significantly related.

The first 2x3 contingency table analysis was used to test whether there was a contingency between the interaction types (feeding vs. none) and dog attention. The results showed that there was no significant relationship between the feeding and none interaction type and dog attention, Pearson X^2 (3, N= 105) = 0.258, p = 0.005, Cramer's V = 0.05. A second 2x3 contingency table was used to analyze whether there was a significant relationship between the interaction type (feeding vs. other interactions) and dog attention. The results of the test showed that there were significantly more dogs who had high attention during the run when they engaged in other interactions

Figure 1. Relationship Between Handler-Dog Interactions and Dog Attention

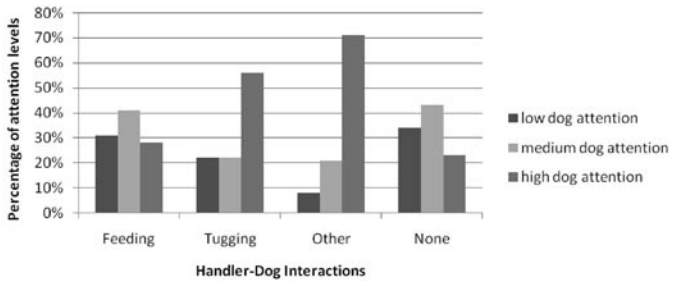
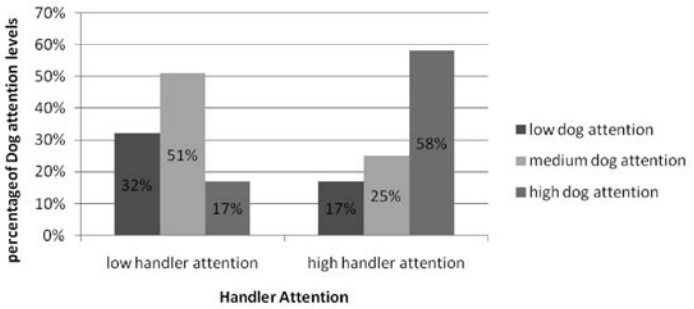


Figure 2. Relationship Between Handler and Dog Attention



before the run, than when dogs engaged in feeding before the run, Pearson X^2 (2, N=82) = 13.502, p = 0.005, Cramer's V = 0.406. A third 2x3 contingency table analyses was used to determine whether there was a significant relationship between type of interaction (tugging vs. feeding) and dog attention. The test showed that there was no significant relationship between tugging and feeding interactions and dog attention, Pearson X^2 (2, N = 76) = 4.878, p = 0.005, Cramer's V = 0.253. A fourth 2x3 contingency table analyses was used to test whether there was a significant relationship between type of interaction (tugging vs. none) and dog attention. The results showed that dogs who engaged in tugging before the run had higher attention levels during the run, than dogs who did not engage in any interaction, Pearson X^2 (2, N = 65) = 6.212, p = 0.05, Cramer's V = 0.309. A fifth 2x3 contingency table analyses was used to determine whether there was a significant relationship between the type of interaction (tugging vs. other) and dog attention. The results showed that there was no significant relationship between these two interactions and dog attention, Pearson X^2 (2, N = 42) = 1.772, p = 0.005, Cramer's V = 0.205. A sixth and final 2x3 contingency table analysis was used to test whether there was a significant relationship between the type of interaction (none vs. other) and dog attention. The test showed that dogs who engaged in other interactions before the run had higher levels of dog attention during the run, than dogs who did not engage in any interaction, Pearson X^2 (2, N = 71) = 15.333, p = 0.005, Cramer's V = 0.465.

Handler attention and dog attention

A two-way contingency table analysis was conducted to evaluate whether there was a significant relationship between handler attention before the run (high handler attention, and low handler attention), and dog attention during the run (high dog attention, medium dog attention, and low dog attention). Overall analyses of all the groups showed that dog attention was contingent upon handler attention, Pearson X^2 (2, N = 138) = 25.970, p = 0.005, Cramer's V = 0.434. However, to assess which groups were significantly contingent to one another further 2x2 contingency table analyses were conducted.

The first two- way contingency table analysis was conducted to evaluate whether there was a significant relationship between handler attention levels and medium and high dog attention levels. The analysis showed that high handler attention before the run had significantly more dogs with high dog attention during the run, than low handler attention, Pearson X^2 (2, N = 103) = 21.378, p = 0.005, Cramer's V = 0.456. A second two-way contingency table analysis was conducted to evaluate whether there was a significant relationship between handler attention and low and high dog attention. The analysis showed that high handler attention before the run had significantly more high dog attention, and significantly less low dog attention, than low handler attention, Pearson X^2 (2, N = 79) = 13.301, p = 0.005, Cramer's V = 0.410. A final two-way contingency table analysis was conducted to evaluate whether there was a significant relationship between handler attention, and low and medium dog attention. The results showed that there was no significant relationship between the groups, Pearson X^2 (2, N = 69) = 0.962, p = 0.005, Cramer's V = 0.118.

DISCUSSION

The results of this study suggest that dog attention is contingent upon handler attention. When handlers are attentive to their dogs (high handler attention) before they enter the ring, it is likely that during the run dogs will also be attentive to their handler (high or medium dog attention). These results support the first hypothesis; however the second hypothesis was not fully supported. The results show that only some human-dog interactions before an agility run affect dog attention during the run. Overall the results indicate that handler attention towards their dog before an agility run is more effective at keeping their dogs attention during the run than the type of handler-dog interaction before the run.

Human attention may affect dog attention more than the type of human-dog interactions because previous research has shown that dogs are sensitive to the attentional states of humans (Call, Brauer, Kaminski & Tomasell, 2003, Schwab, Huber, 2006, Gacsi, Miklosi, Varga, 2004). Dogs are more obedient and perform better at tasks when their owners are attentive to them. These studies reinforce the current study's findings because handlers who were more attentive toward their dogs before they entered the ring had more attentive and obedient dogs during the run, because these dogs were paying attention and obeying the commands of their handlers during the run. In addition the results showed that handlers who showed low attention toward their dogs before they entered the ring had dogs who were far less attentive towards them during the run, which supports previous research that handlers or owners who do not pay attention toward their dog have less obedient, and poorer performing dogs. Dogs may become more attentive to their handlers if their handlers are more attentive to their dogs, therefore it may be a reciprocated behavior. Overall the results of the current study support previous research that human attention can affect dog performance, obedience and attention.

Results also showed that some types of play between humans and dogs before an agility run can also affect dog attention during an agility run. However this hypothesis was not strongly supported. Results showed that overall any handler-dog interaction before a run affects dog attention during the run. Results indicated that tugging and other interactions were significantly more effective on dog attention than no interaction (none). This may suggest that the type of interaction a handler engages with its dog is not important, but that interaction alone, with a dog before an agility run is important for keeping a dogs attention during a run. In addition feeding may not be effective at keeping a dogs attention during the run since results showed it was significantly less affective at keeping a dogs attention than other interactions, and it showed to have the same effect on dog attention as no interactions. In general interacting with a dog before it enters the ring, regardless of what type of interaction, is effective at keeping a dogs attention during an the run.

Although Rooney and Bradshaw (2003) found that tugging was linked with more dog involvement than other types of play such as fetch, this was not found in the current study. This may be due to the lack of handler teams engaging in tugging before the ring, which may have affected the results. However in future studies a larger sample of handler and dog teams tugging before a run may be necessary to support the hypothesis that tugging effects dog attention significantly more than other types of interactions.

In conclusion the current study found that before a run, human attention toward a dog is more effective than the type of human-dog interactions at keeping a dog's attention during the run. However it was found that interacting with a dog before a run does affect dog attention compared to no interactions. Given the limitations of time, money, and opportunities the sample size was not large enough to generalize to all handler-dog teams, therefore in future studies a larger sample covering more agility trials around the United States may be needed for more generalized results. The implications of this study may be useful for handlers training their dogs for agility, training drug dogs or service dogs, and may be helpful to better understand the affects of human and dog interactions, and how human behavior can affect dog behavior.

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