In Sync

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If you've ever taken a stroll side by side with a close friend, you may have noticed that your movements appear to be in sync. Whether it's your strides or the movements of your arms that appear to be synchronized, this behavior is not coincidental, but rather an obscure harmonization resulting from the social nature of the human species. This phenomenon is not only characteristic of humans, but is far more common among animals than you may think. Behavioral synchronization is a strategy used by many species and serves a variety of purposes, such as ensuring protection from predators and building social cohesion. Behavior synchronization is best described as interspecific or intraspecific coordination of actions among individuals. That means that it is not limited to individuals within the same species, but also between and among individuals of different species. This is a key feature of behavioral synchrony, as we'll see shortly. The interactions of individuals within species, including humans, facilitate relationships, build cohesion, and create an interdependence from which individuals can learn, grow, and survive. You may already be aware of a classic case of behavioral synchronization that takes place between mothers and their babies. When a mother and her baby meet a stranger, the mother's reaction to the individual is mimicked by the baby. If mom avoids the stranger, the baby will do the same; likewise, when mom is positive or curious toward the stranger, the baby will exhibit a similar reaction (De Rosnay et al., 2006). Similar synchronous behavior has been witnessed in birds, insects, and various mammals such as dogs, which will be my focus from here on out. These domestic creatures, strongly regarded for their companionship and unwavering devotion to humans, must have adopted a mutualism that goes beyond language. Recent studies have questioned whether dogs exhibit synchronous behavior with their human counterparts and if so, to what extent? Before diving into the nitty-gritty details, I'd like to introduce some early research that was published in Psychological Science that implored a similar question. In 2004, Michael M. Roy examined the familiar conviction that dogs bear resemblance to their owners. Although strictly examining resemblance regarding physical attributes, Roy discovered that purebred dogs significantly exhibited similar traits to their owners. He proposed that this could be the result of the two developing similar traits over time or simply because owners choose dogs that look like them. Additionally, Roy made an interesting observation when he noted that dogs and owners expressed similar personality traits. Owners who were warm and cordial typically had very friendly and approachable dogs as well. So, it begs the question, is this correlation between personality traits significant and through what mechanism do similarities in personality occur? Perhaps it can be explained in the context of development, an approach similar to what we know about child development and the formation of particular traits or temperament. If this were the case, dogs raised by the same owner since puppyhood would more likely exhibit similar personality traits than dogs that were adopted. This kind of psychosocial approach requires more research, but Roy's findings are consistent with what behavioral ecologists believe to be synchronous behavior between dogs and humans.

To accurately analyze the interactions between dogs and humans, it is important to understand how dogs interact with members of the same species. Not surprisingly, initial observations of dog behavior in group settings revealed that dogs exhibit synchrony in activities such as running, howling, and sleeping. Interestingly, when paired with their closest social partner, dogs were significantly more likely to coordinate movements when running or initiating an action (Bonanni et al., 2010). Therefore, synchrony is dependent on the degree of familiarity between individuals or the degree to which social bonds have been reinforced among individuals. It is fair to say then, that dogs and humans will not exhibit synchronous behavior if an attachment is not present. We can confirm this notion with the known interactions between mothers and their babies where an inherent attachment exists. Previous studies that examined the interactions between dogs and humans have been limited and did not take into account behavioral synchrony in a controlled setting without confounding variables. One study showed that when walking on a leash, dogs and their owners coordinated the direction of their movement and the speed at which they walked (Gaunet et al. 2014). However, this study did not rule out the effect the leash may have had on the dog's behavior, nor did it consider the fact that walking a dog is a habitual behavior and the actions may have been learned.

There have been several promising studies showing that dogs do in fact learn by observing the behavior of their owners. This was recorded by Kubinyi et al. (2003), when researchers presented a dog and its owner with a box, inside of which there was a ball. At first, the owners attempted to open the box and access the ball while their canine carefully watched. When the box was finally opened, the ball was revealed. Using the same procedure, the researchers then gave the dog an opportunity to open the box. Armed with inventive, the dog quickly attempted to crack open the box by utilizing the same method they observed their owner using. Despite there being other ways to manipulate the box and gain access to the ball, the dogs relied on a learned behavior obtained from their owner. This research provides overwhelming evidence of a dog's ability to mimic human behavior. Putting together what we know so far, dogs are capable of synchrony among conspecifics, attachment is a critical factor in synchronous behavior seen across several species, and dogs are especially impressionable by their owner's behavior. With these findings, researchers asserted that dogs will synchronize their behavior with humans in a variety of ways. Duranton et al. (2015) first hypothesized that a dog's behavior would correspond to the owner's reaction when a stranger entered the room. Specifically, Duranton predicted that a dog will take more time to initiate contact with the stranger if their owner retreats away from the stranger. In a follow up study, Duranton et al. (2017) hypothesized that in an enclosed, unfamiliar area where the dog is free to roam with its owner, the dog will synchronize its behavior, location, and activity with its owner. Let's take a closer look at the data compiled from these studies. From there, we can determine whether our canine companions can or cannot consciously (or unconsciously) consider the nonverbal cues elicited by human behavior and if it contributes to the synchronization of behavior between the two species.

Duranton began her work with dogs by assessing patterns of social referencing toward an owner when an unfamiliar object or person was introduced. In this case, social referencing occurs when a dog uses an owner's nonverbal cues, such as body language, as a guide to making decisions. In unknown situations, babies use social referencing by turning to their mother and using facial expressions to guide behavior. This is analogous to the social referencing observed in dogs toward their owners. Just like babies, dogs are expected to engage in social referencing behavior in situations that present a probable threat. In Duranton's study, an owner and their dog were placed in an unknown room where they were allowed ten minutes to adjust to the new environment. After ten minutes, a stranger entered the room. Before the start of each trial, the owner was instructed to display one of three behaviors. The owner would either approach the stranger, remain motionless, or retreat backward away from the stranger. Throughout the trials, the owners were also instructed not to talk to their dogs, look at them, or display any facial expressions. This would allow the researchers to minimize confounding variables and strictly determine how the owner's behavior affected the dog's behavior. The results indicated that 76.4% of dogs exhibited a referential look, which is defined as looking at the owner and the stranger consecutively within two seconds. Gaze alterations were observed in 72.2% of dogs and were distinguished by any combination of gazes toward the owner, then the stranger, and back again at the owner. The most significant data from this study was obtained from the retreat condition. In this treatment, dogs were more likely to exhibit a response toward their owners while they were retreating. Dogs were also quicker to gaze at their owner when they began their retreat. When comparing all three conditions, dogs in the retreat condition were also least likely to approach the stranger at any time during the trial. In trials where the owner was instructed to approach the stranger, dogs were more likely to make contact with the stranger (Duranton et al. 2015). Given that dogs in the retreat condition were more likely to exhibit behavior that was consistent with their owner's, the researcher's hypotheses were on target and determined that dogs use social referencing as a guide to making decisions regarding their behavior and movement in relation to their owners.

Recently, Duranton dug deeper for answers in understanding the complex relationship between dogs and their owners. To further

analyze the synchronous interactions of canines and humans, Duranton examined several types of synchronous behavior, including temporal, location, and activity synchrony. Temporal synchrony is the alteration of behaviors at the same time among one or more individuals. Location synchrony is the act of one individual seeking to be in the same position as another individual at the same time. Activity synchrony takes place when one or more individuals carry out a particular behavior at the same time. During this study, dogs and owners were placed in an unfamiliar room and were given ten minutes to adjust to their new surroundings. The room was marked in such a way that at the center was "location C," to the right was "location R," and to the left was "location L." A line, "line W," ran between the three locations. The owner was to stay still or walk between these various locations depending on the condition. In the control treatment, the owner walked to the center of the room and stayed there for 30 seconds. In the still treatment, the owner was instructed to walk either to the left or to the right side of the room and stay there for 30 seconds. In the moving treatment, the owner continually walked between location L and location R along line W for 30 seconds. Cameras recorded the interactions that followed. The results showed that across all treatments, dogs spent almost 80% of their time near their owners. This supported the researcher's hypothesis that dogs would exhibit location synchrony with their owners. When examining activity synchrony, the results revealed a positive correlation between the time dogs spent stationary and the time their owners were stationary. Dogs spent significantly more time stationary in the control and still treatments than in the moving treatment. Across all trials, the data did not show any significant correlation between the time dogs altered their behavior in response to their owner, but it was noted that there was a significant difference between breeds. Specifically, shepherds exhibited greater temporal synchrony than molossoid dogs (Duranton et al. 2017). Molossoid, or molosser, dogs are a classification of large breeds effectively used in search and rescue missions or, more commonly, as guard dogs. This may be confusing given that some shepherd species fall under the molossoid category, so further clarification by the author is needed. Ultimately, the results confirmed the researcher's hypotheses and displayed several specific types of behavioral synchrony found between dogs and their owners. We can conclude that dogs and humans are capable of behavioral synchronization beyond verbal cues much like mothers and infants do. This is the first known study to prove that this phenomenon between dogs and humans exists.

The next time you find yourself walking alongside your best friend or decide to take your canine comrade for a walk, don't be surprised if you reflect one another's actions. No, it is not their attempt to rile you through a satirical exposé, but rather an idiosyncratic manifestation of the social attachment you two share. The capacity for human individuals to mimic each other during certain activities or the social referencing infants use to prompt a reaction is akin to a dog's ability to mirror their owner's behaviors in response to subtle cues evoked by the owner. Although dedicated dog owners have probably become aware of this at some point through the day to day interactions with their pets, these recent studies confirmed a significant, positive correlation between the behavior of dogs and owners. This paradigm can be explained through several mechanisms which suggests why this synchronicity exists. For starters, the domestication of dogs has resulted in a strong dependence on humans for care and nutrition. By providing the bare necessities of food, water, shelter, and performing cooperative tasks such as going on walks, participating in play, or hunting, owners establish strong social bonds with their dogs. In return, dogs provide loyalty, companionship, and a friend for life, even if it may be a short one. Another idea that attempts to explain behavioral synchrony and critiques the studies mentioned is that an unknown environment could have elevated a dog's stress levels. Anxiety is common in unfamiliar environments and could have resulted in more avoidant behaviors between dogs and strangers. Duranton et al. (2015) was aware of this issue and paid careful attention to unusual behavior, but does not record any stressful behaviors in the participating dogs. Owners confirmed that their dog was acting naturally. It must be noted, however, that assessing psychological constructs in dogs is difficult to do, and more thorough measures should be taken to rule out any underlying confounding variables. One last thought that attempts to explain behavior synchrony is the process of learning and life experiences that shape development, behavior, and cognition. I mentioned earlier that dogs raised from a puppy and dogs that were adopted might exhibit varying degrees of similarity with their owner. Just as children are largely influenced by their mentors, puppies may adopt stronger relationships with their owners as they familiarize themselves with the world. With their basic needs met, children can grow, learn, and soon enough, establish autonomy. Whether or not dogs are subject to similar developmental patterns as humans has yet to be seen and would be key research in further understanding human-dog relationships. The data from Duranton et al. (2017) shows that older dogs switched tasks quicker than younger dogs in response to their owner. This could be the product of lifetime learning. Over time, dogs may forge cognitive behavioral patterns that are consistent with past experiences or have been important in mitigating unintended consequences, such as danger.

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