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Learning Theory 104
Assignment #6 of 14.

Write an essay explaining the Premack Principle and how it can be applied to dog training and behaviour modification both to promote appropriate behaviour (thereby preventing problems) and also to help address problem behaviour.

When we think about the use of positive reinforcement in dog training much of our focus is placed on the relationship between the dog's behaviour and our delivery of the stimulus we have labelled as a 'reinforcer'. This focus is justified, as it is the association the dog makes between their behaviour and the reinforcing consequence that works to strengthen and maintain the dog's future behaviour.

While the majority of dog trainers are happy to simply use positive reinforcement training techniques to better the lives of dogs (and owners) everywhere, scientists aren't so easily contented and many psychologists have attempted to solve the puzzle of just what is reinforcing about a reinforcer (Chance, 2003, p 172).

The principles of reinforcement theory are usually described as a contingency between an operant behaviour and an environmental consequence, suggesting that the response and the consequence are two distinct classes of events (Pierce & Epling, 1999, p 344). The psychologist David Premack took a very different view to the problem of why reinforcers strengthen behaviour by noting that the consequences could be thought of as behaviours themselves (Chance, 2003, p 174). If we look at the principles of reinforcement theory in this way, it seems that some behaviours will act as reinforcers for other behaviours, which is exactly what David Premack theorised (Domjan, 2003, p 200).

Premack and his colleagues conducted many experiments to test his theory (Domjan, 2003, p 200). Pierce & Epling describe a 1962 experiment where Premack deprived rats of water for 23 hours before placing them in an environment where they had the choice to run in a wheel

or drink water. Obviously the rats were thirsty, so they spent more time drinking water than running. Next Premack set up a contingency where access to water only came after the rats ran in the wheel. This contingency increased the behaviour of running in the wheel, showing that drinking reinforced running. When free access to water was given the rats ran more than they drank. Premack locked the wheel and only removed the brake after the rats had licked the water tube for a few seconds. With this contingency in place the rate of drinking increased, that is the rats drank to get a chance to run on the wheel.

It is clear that in any situation, some behaviours have a greater likelihood of occurring than others (Chance, 2003, p 174). Therefore different behaviours have different values relative to one another at any moment (Chance, 2003, p 174) – in other words, some are more desirable to perform than others. According to Premack, it is this relative value that determines if one behaviour will have reinforcing properties over another (Chance, 2003, p 174). Thus the Premack principle states; "higher probability behaviour will reinforce lower probability behaviour" (Pierce & Epling, 1999, p 397).

The Premack principle helps us remember that the value of a reinforcer is relative and therefore changeable (Domjan, 2003, p 202). All to often dog trainers think of certain stimuli, such as food, as a reinforcer first and foremost. While eating may be high up on the choice behaviour hierarchy for most dogs, there are some situations where it comes in under the chance to partake in other behaviours. Dogs who attend training clubs once a week are often said to behave in ways that are "stubborn" and "vengeful" in this situation as they strain at the end of the lead (ignoring the cheese that is being waved around in front of their nose that had them glued to their owners every word at home), to get to their class neighbour. Rather than the above constructs, a sound knowledge and application of the Premack principle (not to mention the process of generalisation) would provide owners with a great deal more power to use the behaviour of socialising as the best reinforcer to strengthen the obedience behaviour they are working on.

To employ the Premack principle and identify effective reinforcers in an applied setting we need to know the relative values of various activities in a given setting (Chance, 2003, p 174).

This can easily be done by observing and noting how much time and energy the animal in question puts into the various activities on offer (Chance, 2003, p 175). The Premack principle also gives trainers the opportunity to personalise reinforcement procedures to take advantage of individual preference (Domjan, 2003, p 202). For dog trainers and their charges, this can be done by observing the dog and noting the time the dog spends performing various behaviours. Once this information is gained the higher probability behaviours can be used to reinforce lower ranking behaviours by being placed under stimulus control and cued when appropriate or controlled some other way (such as the use of a leash or withholding a toy).

When my youngest dog was growing up, I spent a great deal of time watching her and listing all the different activities she would naturally partake in. For instance at the local park she would commonly:

- run
- sniff
- chase a ball
- chase her brother
- run back to me
- chase the local birds
- urinate
- defecate
- roll in the mud

The above list was made with no particular thought in mind as to what she did more of, but after two years I have solidly observed a higher likelihood of chasing the local birds and chasing her ball when those two behaviours are available, than any other of the above listed behaviours. The behaviour of ball chasing was an easy behaviour to use as a reinforcer for lower probability behaviour, as I control the ball flying through the air. Using chasing the local birds as a reinforcer involved restricting access to the behaviour by having Pearl on lead and only releasing her after presenting the audible stimulus “Cockies” (An Australian slang word for parrots) and prompting her to run after the birds. Gradually, the lead was removed

and Pearl would remain in a stay until given the cue. The behaviour is now strongly under stimulus control and a great reinforcer for a beautiful agility run!

Another personal example of the Premack principle involves all three of my dogs, all of who love a run at the park. More often than not though, I am ready to go home before they are and the behaviour of getting in the car to go home was less consistent than a professional animal trainer would like. On the way up the hill to the car our routine was to stop and have a drink at the tap. All three dogs showed a great desire to lap up the cool water after their run. If water drinking was consistently a high probability behaviour at this point, I wondered if I could use it to strengthen the less likely behaviour of jumping in the car. Now days the dogs get their drink in the car and all dogs make a bolt up the hill, past the tap and into the back of the car for the chance to have their drink. Thus drinking strengthened jumping in the car.

One important factor in the use of the Premack principle involves understanding that deprivation of a behaviour will increase its probability (Lindsay, 2000, p 251). Premack actually regarded deprivation as a necessary condition for reinforcement (Domjan, 2003, p 203) and it has been shown that any behaviour can be made more probable and therefore more valuable by depriving the animal access to it (Lindsay, 2000, p 251). This theory is an important one to remember as even the most commonly desired behaviours will lose their value once the dog has had the opportunity to partake in them for any length of time. Deprivation and satiation work hand in hand to influence the desires and therefore the behaviours of our dogs at any given moment. In the above example of using the chance to have a drink of water to reinforce getting in the car, we can see that this behaviour is only going to have reinforcing properties after the dogs have had a chance to run and build up a desire to drink that is higher than the desire to continue running.

While the emphasis of the Premack principle is often on the use of higher probability behaviours to strengthen lower probability behaviours, trainers also need to keep in mind lower ranking behaviours can act as punishers for higher ranking behaviours if a contingency is created between the two (Lindsay, 2000, p 251). The lack of this understanding amongst

pet dog owners is one of the main reasons for the development of some common behaviour problems. Dogs who will not return to their owner at the end of a chance to run off lead often learn not to respond to this command because the behaviour of coming is punished by being placed on lead. Even when the dog is given a food treat in the name of 'reinforcement' for coming, eating the treat is often of a lower value than continuing to run, so the behaviour weakens. Scenarios like this have perpetuated the myth in some instances that "reinforcement training doesn't work". Again we must remember that there is nothing absolute about a stimulus acting as a reinforcer (Domjan, 2003, p 202). Understanding the Premack principle can be a great help for those trainers new to positive reinforcement training to do just that.

Premack's theory of reinforcement also has the advantage of being strictly empirical (Chance, 2003, p 176). As the science and art of dog training emerges from the tradition of foundations such as dominance, drives and other such constructs, knowledge of the Premack principle helps trainers understand positive reinforcement training beyond the handing out of food treats for desired responses. Using access to desired behaviours to strengthen lower probability behaviours can allow our dogs a great deal more freedom than they may other wise get. The training method of "life rewards" has it's roots in the Premack principle as we use the dogs preferred behaviours to positively reinforce all those less than likely but essential obedience behaviours every dog should know and respond to. If young puppies have a strong association between their owner and access to all that is good in the world, controlling their behaviour will be made much easier as they grow into adult dogs.

References:

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