Using Counter Conditioning and Desensitization Techniques Effectively to Modify Behavior
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Operant Conditioning
Operant conditioning, also known as instrumental or Skinnerian conditioning, is based on the principle that the consequences of animal’s behavior will influence its frequency. This is known as Thorndike’s Law of Effect, which says that behavior that results in pleasant outcomes will be repeated, and that which results in unpleasant consequences will decrease in frequency. The outcomes that are the working concepts of operant conditioning are positive and negative reinforcement, positive and negative punishment and extinction. These terms are defined in the following table.

<table>
<thead>
<tr>
<th>Consequence (What Follows the Behavior)</th>
<th>Add It, Present It, Give It</th>
<th>Remove It, Withhold It, Take It Away</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Enjoyable Thing</td>
<td>Positive Reinforcement (R+)</td>
<td>Negative Punishment (P-)</td>
</tr>
<tr>
<td></td>
<td>Behavior Increases</td>
<td>Behavior Decreases</td>
</tr>
<tr>
<td></td>
<td>Example: Dog sits, he receives a food treat</td>
<td>Example: Person stops petting a dog when the dog jumps on her</td>
</tr>
<tr>
<td>An Unpleasant Thing</td>
<td>Positive Punishment (P+)</td>
<td>Negative Reinforcement (R-)</td>
</tr>
<tr>
<td></td>
<td>Behavior Decreases</td>
<td>Behavior Increases</td>
</tr>
<tr>
<td></td>
<td>Example: A cat is squirted with water when she jumps on the table</td>
<td>Example: A person backs away from a fearful dog who is growling.</td>
</tr>
</tbody>
</table>

Classical Conditioning
Classical conditioning, also known as respondent conditioning or Pavlovian conditioning, is the process by which an animal learns an association between two events. One stimulus (the CS, conditioned stimulus) predicts the occurrence of the other (the UCS, unconditioned stimulus). The CS can then elicit the same, or similar response as the UCS. Examples are in the following table. The response elicited by the UCS, and after training (conditioning), the response elicited by the CS, is typically involuntary. In Pavlov’s classic example, the food (the UCS) and then the bell and the light (the CS) elicited salivation (the UCR then the CR), an involuntary reflex. Operant conditioning is focused primarily on voluntary behaviors. However, it is not true that a strict dichotomy exists with operant conditioning affecting only voluntary behaviors and classical conditioning affecting only involuntary behaviors. This is important to remember.

<table>
<thead>
<tr>
<th>Conditioned Stimulus</th>
<th>Unconditioned Stimulus</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doorbell</td>
<td>Arrival of visitors</td>
<td>Greeting, fear, threat</td>
</tr>
<tr>
<td>Ride in the car</td>
<td>Veterinary visit</td>
<td>Fear</td>
</tr>
<tr>
<td>Wind</td>
<td>Thunder</td>
<td>Fear</td>
</tr>
<tr>
<td>Leash</td>
<td>Walk</td>
<td>Excitement</td>
</tr>
<tr>
<td>Can opener</td>
<td>Food</td>
<td>Salivation</td>
</tr>
</tbody>
</table>

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Dogs learn a significant amount about their environment through classical conditioning. Often, they learn associations that are undesirable, or which we are unaware they have learned until a problem arises. Classical conditioning is not dependent on the animal’s behavior. In other words, the association between events occurs regardless of what the animal is doing. However, the UCS and the CS do elicit a response.

In many situations, classical and operant conditioning occur simultaneously. For example, our cat Buffett has learned that the “riiippppping” sound of his packet of food means dinner is being served (classical conditioning). He runs to the kitchen, and jumps up on the counter and begins eating. Running into the kitchen in response to the “riiippppping” sound is positively reinforced with food.

Similarly, our dogs know that the sounds of their leash and collars being taken off the hook by the door mean that they get to go for some sort of excursion (classical conditioning, leash predicts walk). Running to the door in response to these sounds is reinforced with a walk or car ride.

Operant Counter Conditioning

Counter conditioning can be based on either operant or classical conditioning. Operant counter conditioning is a technique whereby a particular cue comes to elicit a behavior that is “counter to”, or incompatible with the unwanted behavior. For example, for many untrained dogs, a visitor entering the house is a cue for, or elicits, jumping up. Successful counter conditioning would result in the visitor’s appearance eliciting an automatic “sit” instead.

Various training methods are available to initially elicit a sit. The sit could be prompted with a treat, for example. Alternatively, the person on whom the dog is jumping could step forward into the dog’s space, which may cause the dog to backup and sit. If the dog is already trained to “sit” in response to a verbal cue, this could be used instead. Some behaviorists refer to this as counter commanding.

Counter conditioning is not completed until the sight of the visitor becomes the cue for the dog to sit, without any intervening prompts.

Classical Counter Conditioning

This type of counter conditioning is not based on eliciting a specific behavior from the animal. Remember that classical conditioning is learning that one event predicts another. Thus, classical counter conditioning occurs when a conditioned stimulus (CS) predicts an unconditioned stimulus (UCS) that is “counter to” the existing one.

For example, the sight of nail clippers might predict pain and unpleasantness. Classical counter conditioning would be accomplished instead when the nail clippers predict food, petting, or any other enjoyable event. Additional examples follow.

<table>
<thead>
<tr>
<th>CS</th>
<th>Existing UCS</th>
<th>Original Conditioned Response</th>
<th>Counter Conditioned UCS</th>
<th>Counter Conditioned Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children</td>
<td>Loud noise, frightening movements</td>
<td>Fear, avoidance, aggression</td>
<td>Cookies</td>
<td>Tail wags, relaxed behavior</td>
</tr>
<tr>
<td>The new cat in the house</td>
<td>Being pounced on, harassed</td>
<td>Fear, avoidance, aggression</td>
<td>Tuna</td>
<td>Approach</td>
</tr>
<tr>
<td>Veterinary clinic</td>
<td>Restraint, pain</td>
<td>Fear, avoidance, aggression</td>
<td>Tennis ball</td>
<td>Excited, friendly, can’t wait to play fetch</td>
</tr>
</tbody>
</table>

Classical and Operant Conditioning and their Effect on Voluntary and Involuntary Behaviors

Notice from these examples that the conditioned responses are voluntary responses motivated by emotional reactions. The emotion of fear for example, motivates avoidance. Emotional reactions are involuntary. Involuntary reactions or responses are not very susceptible to operant conditioning. However,
biofeedback training is one example of how operant conditioning can be used to modify involuntary responses, such as heart rate.

Sometimes (not always), and with much practice, people can use their cognitive abilities to inhibit voluntary behaviors that are motivated by involuntary emotional reactions. For example, I can learn to inhibit myself from swearing when someone cuts me off in traffic. I might be motivated to do so if my husband was in the car, and I knew he'd become angry with me if I swore. However, even if I can learn to keep quiet when my husband is riding with me, I will likely continue to be angry about being cut off, and giving sufficient provocation (two people in a row cutting me off, if I'm already angry about something else), or when I'm in the car by myself, my swearing behavior will likely reoccur.

To use this same analogy with an animal, we may be able to teach a dog to sit rather than lunge at a person by punishing lunging with a squirt of water, by yelling at him, or giving a jerk on a leash attached to a choke or pinch collar. However, the underlying emotional reaction to the person remains, just as does my underlying anger at discourteous drivers. And because animals don't have an overriding intellect or moral sense (I know I shouldn't lose my temper) the inhibition of the behavior will be even more difficult. The dog may be so aroused (fearful or angry) that these emotions interfere with his ability to sit.

Emotions can influence other voluntary behaviors. Anxiety and other emotions can result in poor, or no performance of previously conditioned voluntary behaviors. Remember how you could never perform your music or dance as well during a recital as you did during practice?

Address Emotional States First

Because emotional states affect behavior it is often necessary to modify the emotional state before we can influence a voluntary behavior. For example, I can better perform my musical piece during my steel pan drum recital if I am calm and relaxed rather than anxious and nervous, or even angry about spilling coffee on my clothes immediately before the recital. I will be less likely to yell at drivers if instead of becoming angry when they are discourteous, I feel happy about that. How can we change angry, anxious or fearful emotional states to calm and relaxed ones? Through classical counter conditioning.

Let's take the “road rage” example. What do you think would happen if, every time a driver cut me off in traffic, my husband reached over from the passenger seat and slapped me $20? Would I become angrier? How might my emotions or feelings change? How might my behavior change?

When we conduct an in-home consultation we are often met by an aggressive, frightened or even an unruly dog. These dogs may be shying away from us, barking and growling at us, or jumping at us. In most situations, the first thing we do is to toss treats on the floor while otherwise ignoring the dog. Are we reinforcing any of the aforementioned behaviors? If so, how would the dog continue to behave? If not, how would the dog’s behavior change?

Can We Reinforce Fear and Other Emotional States?

Suppose your child is watching a scary movie and he becomes frightened and begins to cry. You pick him up to cuddle and comfort him. Is he likely to become more afraid? If comforting him reinforces fearful behavior then would you not expect his fear to increase? After all, that's what reinforcement does is to increase the frequency of a behavior. In this example, your attention to your child would be acting as a reinforcer, and your child would discover that being fearful earns more reinforcement. This is how operant conditioning works. Do you think this is what is likely to happen?

The idea that paying attention to a pet when he is fearful reinforces the fear is a widespread misconception.

Desensitization

Counter conditioning is often used in conjunction with desensitization. Desensitization is the gradual, or incremental exposure to a stimulus, ideally without eliciting an undesired response. For example, if a dog or cat is afraid of a child, a desensitization and counter conditioning plan might start with having an older child toss treats at the animal from a distance. Attempting to have the child pet the animal while offering treats may be too fear producing for the animal to be helpful. Desensitization creates tolerable versions of a problem situation so that classical or operant counter conditioning, or even counter commanding can proceed.

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Desensitization is sometimes erroneously referred to as the change in behavior itself that occurs as the result of a successful counter conditioning/desensitization plan.

Considerations in Creating a Desensitization Hierarchy

1. Evaluate all the characteristics of the stimulus or situation that influence the animal’s response. Examples are distance; loudness; speed; characteristics of people such as age, gender size; behavior of animals or people such as approaching, attempting to interact with the dog; environmental factors such as inside, outside, familiar or unfamiliar environments.

2. Determine the importance of these characteristics relative to each other. Make a prioritized list, from least to most relevant.

3. Determine the behavioral starting point. Determine what contexts or interactions the animal can tolerate without problem behavior. These contexts will contain some or all of the relevant characteristics presented to the animal at sub-threshold levels.

4. Use the prioritized list to create “practice” situations. Begin with the easiest situation based on sub-threshold levels of all characteristics. Devise intermediate situations comprised of increasingly difficult intensities of each characteristic. Finish with the most difficult situations that approximate “real” ones.

5. Each characteristic should be intensified individually, not simultaneously. A clear behavior change should be observed at each intensity before progressing. As one characteristic is intensified, others may need to be lessened temporarily.

6. The “practice” situations consist of:
   - Beginning at the behavioral starting point as defined above.
   - Pairing the stimulus with an enjoyable event, in the case of classical counter conditioning, or eliciting and reinforcing desirable behavior with a positive reinforcer in the case of counter commanding or operant counter conditioning.
   - Repetitions of each stimulus intensity until a clear behavior change is observed.

7. Stimulus intensities should be increased gradually. Progression to the next level of intensity should be accomplished without eliciting undesirable behavior. The size of the incremental increases will need to be decreased, and/or more “practice” sessions at less intense levels.

8. Implementing these procedures inconsistently, haphazardly, too rapidly or otherwise incorrectly can exacerbate the problem or at the least will be ineffective. Correct implementation of these procedures requires pre-planning and knowledge of theory.

DRI and DRO

These techniques are somewhat related to operant counter conditioning. DRO means “differential reinforcement of other behavior”. In other words, you would reinforce any spontaneously occurring behavior other than the one you don’t like. If I want to decrease Ashley’s begging at the table, I would reinforce any behavior she does that occurs greater than 3 feet away from the table while we are eating. This might not be as effective as it sounds, as some of these other behaviors may also be unwanted.

DRI is “differential reinforcement of incompatible behavior” and is quite similar to counter commanding. However, when using DRI you would reinforce any spontaneously occurring incompatible behavior; rather than cueing an incompatible behavior with a word or other signal.

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References

