



Behavior Matters:

Counterconditioning and the Cognitive Revolution

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If you have ever sought help for a fearful, anxious or reactive dog, the trainer you consulted probably suggested counterconditioning as a remedy. Indeed, counterconditioning is one of dog training's most widely disseminated behavior change methods. Popular versions of this technique often define it as presenting an animal with a reward in the presence of a worrying trigger – or, as one participant in an online discussion group vividly described it, “just raining treats from the sky” on a dog when “his trigger is far enough away not to cause a reaction.” While traditional counterconditioning may not look to the sky to “just rain treats,” it does literally enact its name: “countering” one emotional response to a stimulus by “conditioning” the subject to adopt another that actively interferes with and blocks the original.

Joseph Wolpe (1958), one of modern counterconditioning's founders, named this process “reciprocal inhibition.” Most often (but not always), this process

involves offsetting anxious, tense responses with deep muscle relaxation and creative visualization. Wolpe's model of reciprocal inhibition has now become the preferred approach for treating phobias and other fear-related anxieties in humans. Those working with non-human animals have also adopted reciprocal inhibition as an effective approach to alleviating fear, anxiety and stress in their subjects.

Like many dog training professionals, I have used and recommended counterconditioning as a behavior modification technique. Over years of trial and error experience, however, I found that traditional counterconditioning failed to generate behavior change in my clients' dogs that was as consistently reliable as I had hoped. Because of this, I gradually forged a hybrid form of counterconditioning that I call Cognitively Modified Counterconditioning™ or CMC. CMC combines the physical relaxation techniques embraced by traditional counterconditioning with insights from the emerging research on animal cognition. Cognition in animals can be broadly characterized as an organism's capacity for information processing. It describes the way animals acquire, process, and interpret environmental information through mechanisms of perception, learning, memory, and decision-making (Sara Shettleworth, 2010).

It is important to note that all behavior in humans, as well as non-human animals, is cognitively mediated, i.e., it is filtered through the information processing mechanisms of perception, learning, memory, and decision making. In naming my hybrid CMC technique as “cognitively modified,” then, I am making a conscious distinction. Although CMC does emulate counterconditioning's focus on deep physical relaxation in the presence of aversive stimuli, it also intentionally modifies the cognitive apparatus by developing skills that are critical for dogs worried about their environment. This is why I believe CMC offers everyday dog trainers an effective technology for permanent behavior change. But to test this argument, I want to consider it in terms of an iconic version of counterconditioning for dogs: Jean Donaldson's (no relation) (2009) “open bar/closed bar” technique, which she describes as “counterconditioning without desensitization.”

One prominent feature of Donaldson's "open bar/closed bar" technique is the stipulation that the "bar," or access to the appetitive reward, opens regardless of a dog's behavior toward the scary stimulus. Donaldson illustrates this with the following sequence:

- The bar opens every time the scary stimulus appears.
- The bar closes when the scary stimulus disappears.
- The bar consists of something very special the worried dog does not get in any other circumstance. Nothing else but the scary stimulus makes the bar open.
- When the bar is open, the dog's behavior doesn't matter.

There can be no doubt that counterconditioning as represented by Donaldson's open bar/closed bar has offered dog trainers much-needed hope for their reactive, fearful dogs. Yet, I also wonder whether a dog's behavior makes no difference: is it really true that a dog's behavior during counterconditioning doesn't matter? I wonder about this because several recently published scientific studies have suggested that animals' behavior during counterconditioning not only matters, but also is crucial to the successful outcome of the process. They suggest that an active cognitive processing of the aversive stimulus is critical to an animal's ability to overcome fear and anxiety.

The first study relevant to these concerns was published in the early 1970s by Dennis Delprato (1973). Delprato's study attempted to produce an "animal analogue" to the use of counterconditioning for eliminating fear in humans. To accomplish this, Delprato induced fear avoidance of electrical shocks in laboratory rats: first, by giving them an auditory warning signal and then shocking them through the floor of the long, rectangular box in which they were enclosed. He successfully countered this fear by subsequently feeding the rats food pellets only when they heard the auditory shock warning. Eventually, the rats kept on eating even after hearing the warning that an electrical shock was imminent. On the surface, this might sound like a positive result. After all, isn't the purpose of counterconditioning to eliminate an animal's anxiety in the presence of a trigger? However, according to Delprato, these positive results were very short lived because, when the food disappeared, so did the effects of the counterconditioning (see also Elizabeth Capaldi, Donna Viveiros, & David Campbell, 1983). When denied access to the food pellets, the rats quickly reverted to their previous fear avoidance behaviors. Delprato's study concluded that permanent behavior change requires "therapeutic techniques that facilitate functional exposure (induce the individual to cognitively accept the aversive stimulus)." In other words, counterconditioning can only achieve its maximum effect if an animal "cognitively accepts," i.e., actively interprets and processes

information about the conditioned stimulus. A second, much more recent study of counterconditioning corroborates this conclusion and also provides further clues about what this notion of cognitive acceptance might mean.

In their study, Brian Thomas, Marlo Cutler and Cheryl Novak (2012) begin with the riddle of why counterconditioning has been much more reliable in humans than in non-human animals. They speculate that a major reason for this disparity is the differing expectations underlying the use of this technique. Scientific studies and therapeutic programs directed toward humans routinely ask for intentional responses, such as deep muscle relaxation or creative visualization to access the reward; those targeting non-human animals typically present the appetitive unconditioned stimulus (the food reward) independently of the animals' behavior. Thomas et. al conjecture that the greater reliability of counterconditioning with humans reflects this differential reinforcement of an instrumental response, and they designed their study to test this thesis. Based on the data generated, the Thomas study concludes that effective counterconditioning requires non-human animals to "earn" the appetitive unconditioned stimulus (the food reward) much like their human counterparts.

To test this hypothesis, Thomas and his colleagues counterconditioned a group of rats to fear of electric shock by always giving them an appetitive reward – chocolate milk – when they heard a warning signal for the impending shock. A second group of rats only received access to the chocolate milk when they pressed a lever during the warning. The primary aim of Thomas's study was to investigate whether requiring rats to engage in a behavior – here, pressing a lever – reduced their fear levels more effectively than by giving them chocolate milk no matter what they did. It is significant, then, that the fear renewal rate in the lever-pressing rats was substantially lower than that those that received unconditional access to chocolate milk. According to the researchers, these outcomes suggest that transforming a feared aversive stimulus into a "positive discriminative stimulus for instrumental behavior" like pressing a lever may prevent fear renewal more effectively than when the appetitive reward is unconnected to the subject's behavior. Both the Delprato and Thomas studies emphasize the importance of active cognitive processing in any use of counterconditioning to produce permanent behavior change.

These studies point to several important reasons why I have found Cognitively Modified Counterconditioning to be more effective than traditional counterconditioning, and I want to illustrate this point with a scenario that dog trainers confront quite frequently: dogs becoming aroused in the presence of other dogs. My subject in this scenario is Emmett, a highly intelligent and very athletic 1-year-old, male German Shepherd. Emmett's owner originally contacted me because her dog began lunging and barking at other



Figure 1



Figure 2



Figure 3

dogs after he was attacked by another dog at the local dog park. When I first began working with Emmett, he showed signs of high arousal, such as hypervigilance (he was always scanning), piloerection, growling, barking, and lunging at other dogs, often from 100 feet or more. After several months, however, Emmett was able to tolerate the presence of unfamiliar dogs in a non-aroused manner with little or no reactive body language. Here's how that happened.

For several weeks, I had Emmett's owner work on behaviors like Relax on a Mat. I condition dogs to regard the mat as an environmental cue for lying down and assuming a calm body posture. In this respect it is very similar to Wolpe's construction of counterconditioning as reciprocal inhibition by activating deep muscle relaxation. CMC then "borrows" the dog's history of positive conditioned emotional response to the mat and mobilizes this to help him relax around previously worrisome triggers and in spaces where he might feel anxious (training buildings, agility fields or the front porch). The mat functions as a portable safe space that handlers can take with them when working with their dogs away from home. The mat helps handlers build a consistently predictable outcome for the dog: once he is on his mat, "stuff" – sudden environmental changes, fast movement or the approach of a trigger – may happen around him, but he doesn't need to worry about it. This is partly because an inviolable rule of mat training is that, when a dog is on his mat, he is not available for interaction except with the person doing the training. This is part of the mat's calming properties and must be strictly adhered to by both humans and dogs. It also enables the mat to be a safe and predictable traveling rule structure for the dog.

CMC then pairs these relaxation techniques with teaching specific cognitive skills that dogs reactive to other dogs (or any scary stimulus) desperately need, but do not possess. These skills are especially urgent for dogs that are worried about their environment because they often acquire, process, and interpret environmental information in distorted ways (I often call this a dog doing "bad risk assessment"). The emotional distress of these dogs is all too real, but they perceive danger and threat where it doesn't actually exist. CMC, as well as the Look at That protocol, helps dogs develop more non-aroused mechanisms of perception, learning, memory, and decision making (for an in-depth discussion of the cognitive work done by the Look at That protocol, see L. Donaldson, 2017). For example, if a dog receives a high-value food reward every time

he looks at an unfamiliar dog but does not react, he learns to make better decisions about his behavior and to perceive the environment – and the unfamiliar dog – more accurately. However, teaching a dog to disengage from the concerning stimulus is just as – and perhaps even more – important as teaching them to look at it. With the CMC protocol, dogs literally learn how to turn away, both physically and emotionally, from the triggers in front of them. I introduce the cognitive skill of disengagement by first having a dog look at a trigger and then placing treats on a dog's mat. Most dogs will naturally look down (and away from the trigger) to access the food rewards, and this begins the process of learning how to disengage. It also creates a positive conditioned emotional response with experience of seeing the trigger, whatever that might be. The precise CMC sequence would be:

- Dog relaxes on a mat and looks at the scary stimulus (here, the other dogs behind the dog park fencing).
- Handler marks this behavior.
- Dog looks away from the scary stimulus, looks down to access treats on the mat and in so doing, begins learning how to disengage from his triggers.
- Dog's behavior matters!

The images (above) demonstrate this sequence with Emmett and his owner.

Figure 1: Emmett looks at dogs behind the dog park fencing. Owner marks this behavior with a verbal "yes" and puts a treat down on the mat.

Figure 2: Emmett disengages from his triggers to access his treat on the mat.

In this picture, Emmett was located about 75 feet from the fenced-in dog park area. I staged the training so that Emmett's mat and body position were turned at a 90-degree angle from the dog park fencing. This set Emmett up to practice in an almost exaggerated way both the muscle memory and the cognitive skill of disengaging from triggers Emmett perceived in the environment. Figure 3 was taken later in the same session.

In **Figure 3:** I staged Emmett's mat and body position so that he was directly facing the dog park fencing. This was more difficult for

him (as any head-on view would be), although by the end of this exercise, Emmett was able to calmly acknowledge the running/barking dogs and then disengage from them by looking down and searching for the treats on the mat.

I envision CMC as a precursor—or more accurately, as a kind of intermediary—to a full-fledged Look at That behavior, which does not utilize counterconditioning props like a mat or techniques like physical relaxation. Emmett still needed the support and structure of the mat as an anchor in a very arousing dog park environment. He was not able, at that point, to do a full-fledged LAT behavior while walking on leash. Throwing treats on the mat every time Emmett looked at the dog park dogs was a way of saying to him: “You are anchored here and, just like with every other experience you’ve had on the mat, those dogs are not going to interact with you. You are safe.” As previously mentioned, an important rule of mat training is that when a dog is on his mat, all stimuli are on a “look but don’t touch” basis. The reward is for Emmett remaining calm on the mat and looking at/looking away from the scary dogs running around behind the fence.

Some might call CMC “operant counterconditioning” (Yin) or “counter conditioning with an operant base” (Ken Ramirez, 2017a) – and this would certainly account for CMC’s hybrid repertoire of instrumental and respondent behaviors. However, I coined (and strongly prefer) “cognitively modified counterconditioning” to stress the importance not only of reciprocal inhibition through relaxation techniques but also through teaching the cognitive skills of environmental disengagement and non-aroused information processing. Animal trainer Ken Ramirez (Ramirez, 2017b) observes that the Look at That protocol does not provide a complete behavioral approach on its own, especially when addressing such issues as aggression in dogs. To be effective, according to Ramirez, LAT must be used in conjunction with other tools. One could say the same of traditional counterconditioning with non-human animals. In my experience, CMC significantly enhances traditional counterconditioning, and not just with dog-dog issues – think dog/cat, dog/human and dog/plastic grocery bag issues. CMC molds several already existing techniques into an inclusive behavioral strategy and, in so doing, increases the effectiveness of each individual technique.

The Cognitively Modified Counterconditioning™ protocol offers a resonant example of how integrating knowledge about canine cognition might transform the way we train and partner with the dogs that share our lives. I continue to live in the messy, applied world of everyday dog training. In this world, the admittedly anecdotal evidence of CMC’s success – honed by my work with hundreds of dogs over the past decade – offers enough validation for me. If someone asked me why I thought CMC mattered, my best answer would be: “because behavior matters!” and dogs that are fearful, reactive, or anxious about their environment are also dogs that are suffering. If Cognitively

Modified Counterconditioning can alleviate this suffering faster, more reliably, and more permanently than traditional counterconditioning, it might just be worth a try.



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