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## **BAT 2.0: A New Version of BAT for** Fear and Aggression

Grisha Stewart, MA, CPDT-KA, KPA CTP

n the Spring 2014 issue of The APDT Chronicle of the Dog, I introduced some improvements to the BAT protocol. These changes aim to further reduce stress and empower the dog during the training process. In this article, I will go into some more detail about the specifics of the protocol.

#### How do I take this further?

The big picture is that you should let the dog have maximal control within a safe zone that you create and maintain. Make sure the handler understands the leash skills before doing a BAT set-up with a trigger. My favorite way to do this is to use TAGteach®, which is used to teach skills to humans when timing and precision matter. The BAT leash skills handout breaks leash handling into several distinct behaviors for your clients to rehearse. Start with role playing - the client is the dog, you are the handler, then switch – rather than trying to teach two species at once. Have the client tag you (with the clicker) for doing each of the leash skills correctly, then swap roles so that you tag the client. Next, have the client practice the leash skills with his or her dog. Do this in a spot with interesting smells and no triggers in view. You may even want to subtly scatter some treats in the area so that the dog will move around.

As you may recall from the previous article, the shoreline in my beach analogy is the threshold between curiosity and fear, aggression, and/or frustration. The handler should follow the dog as long as the dog is below threshold. If the dog approaches the shoreline, the handler should slowly stop the dog, wait for disengagement, praise, and then follow the dog's next move.

If the dog goes over threshold during your set-up or if you have no way to create a set-up in which the dog is fully below threshold, use the least intrusive prompt to help the dog disengage from the helper. In a very small space, like a house, that might involve something like clicking or calling the dog as soon as the dog sees the trigger, then moving away to regroup and eat the treats off of the floor. Whenever you need to intrude on the process beyond slowly stopping the dog at his threshold, take another look at your antecedent arrangements and change something to set the dog up for success next time. For example, if you have to immediately call or click when the dog sees the trigger in the house, is it possible to work outside where you might not need to prompt at all, and then gradually go inside?

The illustration of the beach with the support scale has suggestions for what you might do from the least to

most intrusive option. As a professional, you may have your own favorite ways to intervene or your own ways to prompt disengagement (for example, by laughing at the dog if he appears stuck) or to reinforce movement away (say, with agility jumps or nose games after he moves away). Just remember that you still want to avoid having the dog go into working mode; you want the dog's attention to be focused on taking in information as a dog, not on working for you.

This lack of distraction allows the dog to practice more natural social skills with the trigger. The research on attention in desensitization is mostly on humans, and the results are somewhat mixed, but except for situations in which something is physically happening to the body (like a blood draw), distracting the person seems to reduce desensitization effects (see, for example, Telch, et al., 2004; Mohlman & Zinbart, 2001; Haw & Dickerson, 1998).

Avoid always having food in your set-ups. Food is a giant context cue, and as we know from the previous article, fear is likely to return when the context is different from the training context (see also Thomas, Cutler, & Novak, 2012; Capaldi, Viveiros, & Campbell, 1983). That means that treats or toys can become like Dumbo the Elephant's magic feather: the fear comes right back if your client doesn't have them. Fortunately, treats are not required for BAT set-ups, so we can easily avoid having the treats become a context for the good experiences that dogs have during BAT. Additionally, your prompts and cues also provide context, they distract the dog, and they are intrusions to the dog's control over what is happening. Prompts and cues should be used only when needed.

The new version of BAT has the handler more in the background, with fewer prompts. If you are familiar with the older version of BAT, I would like you to notice that this new version is more fluid and has the dogs working at a distance where they are truly below threshold. If you are one of the many people who have been successfully using BAT with clients, you will be happy to hear that the old stages can still fit within BAT 2.0 as "Mark and Move," which is a collection of ways to prompt behavior if the dog accidentally goes over threshold. In Mark and Move, we mark a behavior, move away, and reinforce with some consequence. It's broader than the old stages, but it still includes them.

For example, in the old Stage 3, we would wait for a cut-off signal and then mark it and move away. This is still valid in the new BAT as part of "Mark and

### **STRESS & SUPPORT SCALE**

### Stay On The Beach!

Dog's stress level is analogous to rising water level



Move." Marking a cut-off signal can be used as a way to encourage the dog to walk away at times when he is up to his ankles in the water — for example, when the dog takes more than two seconds to disengage. Stage 2 (clicking for disengagement, moving away, then treating) is also part of Mark and Move and can be used for times when the dog is up to his neck in the water (say, your training space is too small for him to cope otherwise). Stage 1 (click for engagement, move away, and treat) can be used whenever the dog is in over his head.

You do not need to teach the stages anymore, or even go into the full details of Mark and Move. You can just teach a solid recall cue. The clicker in Stages 1 and 2 marks behavior you like, but it also basically serves as a recall cue in those cases.1 The prompt or verbal marker in Stage 3 also moves the dog away, and is useful if the dog is a *www.APDT.com*  bit stuck on what to do next. Even though they are useful get-away tools, it is better to set up situations in which you do not need the old stages. That said, when you are close to the trigger or have to work in tight spaces, you will probably need to use more clicking/calling and moving away because the dog is more likely to quickly go over threshold. It is always good to be on the safe side, because when we mess up, it is the dog who suffers the consequences.

I have always emphasized that the stages were not meant to be done in numerical order, but rather to be used whenever necessary, using the highest stage the dog can do at that time. I've revised that for the current version of BAT, because people used Stages 1 and 2 too frequently during set-ups and Stage 3 was often done over *Continued on next page*  threshold — even by me, in the early years. I am hoping this new conceptualization of BAT will encourage people to truly set things up so that the dog is consistently below threshold and in control of the direction this process takes.

The stages in the older version of BAT were useful for teaching handlers to notice the various bits of body language that they need to know. You can certainly do a separate exercise to practice their skills before the BAT set-up with a trigger. For example, you can place a treat pouch at a distance so that the dog focuses on something. Have the handler click for signs of disengagement from the treat pouch (a stimulus that the dog will engage with out of interest, but without fear, so the stakes are low). At first, you can click and treat the dog for behavior that you want the handler to notice, then have handler do the same.

#### So, what's really going on here?

BAT is essentially low-intensity exposure therapy adapted for non-human animals. Exposure therapy is an empirically supported intervention that has been successfully used with human clients for decades in various forms, including systematic desensitization with relaxation and shaping approach behavior with praise (Barlow, Agras, Leitenberg, & Wincze, 1970; Marks, 1975; Wolpe, 1961). The principle of Pavlovian extinction was the inspiration for systematic desensitization and exposure therapy (Marks, 1975; Wolpe, 1961). There are arguments both for (Field, 2006) and against (Tryon, 2005) Pavlovian extinction being the primary principle behind these therapies, but the arguments against it seem to apply only to humans and not to dogs.

BAT is based, in part, on the empirically supported principle of extinction. Using careful antecedent arrangements, Pavlovian extinction can be facilitated in a gradual, systematic way that does not elicit a fear response from the sympathetic nervous system. Keeping arousal low is important on several fronts, but here's one: research indicates that an asynchronously high heart rate during exposure therapy is a significant predictor of the return of fear after the therapy is fully completed (Rachman, 1989).

When trainers tell clients that dogs do not learn when they are over threshold, they are not really telling the whole story. Dogs generalize what to be afraid of really well when they are over threshold; it is inhibition of the fear that they have trouble learning and generalizing (Vervliet, Baeyens, Van den Bergh, & Hermans, 2013, Gunther et al., 1998). Fear conditioning is not very context dependent, meaning it generalizes more easily than the Pavlovian extinction or other tools used to reduce the fear, so it is important to practice in multiple contexts.

Animal research indicates that Pavlovian extinction silences fear neurons and remodels a specific type of inhibitory junction, called the perisomatic synapse 30 • *The APDT Chronicle of the Dog* • Summer 2014

(Trouche, et al, 2013). The group of mice that went through the extinction procedure showed an increase in perisomatic inhibitory synapses in the amygdala relative to mice who did not receive that treatment. The increase of inhibitory synapses was found around fear neurons that were no longer firing in response to the stimulus after the procedure. What that likely means for BAT, which appears to function as low-intensity extinction, is that the learner's brain now processes signals about fearful stimuli in a different way; there is now an increase of synapses that inhibit the fearful response. A change in brain chemistry makes sense because, of course, change in behavior is only really possible with some sort of shift in the brain.

Another core mechanism at work with BAT is controllability. The older version of BAT used reinforcement given by the trainer to give the dog a sense of control, but the new version has the animal in control of more of the situation, with no need for reinforcement by the trainer. BAT is not an extinction process that is done to the animal. An important aspect of BAT is the controllability of exposure to the trigger. There are mountains of evidence that demonstrate that the degree of predictability and controllability modulates experience of the stimulus and the return of fear after extinction (see, for example, Thomas, et al., 2012; Yang, Wellman, Ambrozewicz, & Sanford, 2011; Maier & Watkins, 2010; Baratta, et al., 2007; Mechiel Korte & De Boer, 2003). In fact, control over aversive events improves extinction, prevents the return of fear, and has a protective effect when the animal is exposed to future stressors, as if the animal expects the next stressor also to be controllable (Maier & Watkins, 2010; Maier, Amat, Baratta, Paul, & Watkins, 2006; Amat, Paul, Zarza, Watkins, & Maier, 2006). The effect of controllability on resilience applies to humans, too (Hartley, Gorun, Reddan, Ramirez, & Phelps, 2013).

Maier et al. (2006) posit that the perception of controllability actively inhibits the neural response to stressors in mammals. When animals underwent the same stressor with the only difference being controllability, the brain activity was very different:

(i) the presence of control is detected by regions of the ventral medial prefrontal cortex (mPFCv); and (ii) detection of control activates mPFCv output to stress-responsive brain stem and limbic structures that actively inhibit stress induced activation of these structures. Furthermore, an initial experience with control over stress alters the mPFCv response to subsequent stressors so that mPFCv output is activated even if the subsequent stressor is uncontrollable, thereby making the organism resilient.

This increase in resilience due to controllability is one of the many reasons that I recommend using BAT with puppies as a way of life when introducing them to new situations. Let them really take things in and allow them to control their experience. There are two exceptions to this rule: the handler must maintain physical and emotional safety for the puppy and also may need to use positive reinforcement to teach impulse control.

One aspect of controllability is knowing that one is safe due to one's own behavior. However, that predictability is not the only reason controllability has great effects on resilience (Maier & Warren, 1988). Even though predictability alone is not as helpful as controllability, adding more predictability reduces stress. If you want to add another element of predictability to the BAT protocol, you can teach a cue that signals the appearance of the trigger, such as "there's a dog." You can do this by calmly saying "there's a dog" just before the dog sees another dog at sub-threshold levels. This is especially useful for dogs who startle easily or have trouble perceiving the trigger until it is too close. A downside to this is that you now have to be consistent about predicting the appearance of a trigger, and whatever phrase you use is also one more context cue to fade.

I believe that the level of controllability, of agency — the ability to control a situation based on one's own actions — is the active ingredient in BAT.2 Controllability makes a significant difference in what the animal learns from BAT and how well it works.

In BAT, we work at a distance where animals comfortably explore their environment and show some interest in the trigger with only sub-threshold behavior. This is important: by moving around in an environment with the stimulus, the animal has an opportunity to learn that the stimulus need not evoke fear, and that the animal has control over exposure to that stimulus. In these set-ups, nature takes its course as the fear extinguishes and the animals learn to engage with stimuli in their own way. For example, the dogs check out the trigger themselves; sometimes they are curious enough to go closer and sometimes they choose to move away. As they move, they are learning that they have agency in this situation. They have choices; they can self-soothe or express curiosity.

There may be times during a set-up where the dog feels more comfortable moving away after investigating the trigger. Situations inducing fear should be limited, but simply turning and walking away is not a problem and will not teach the dog to avoid the trigger. In fact, being able to leave is likely to reduce the stress for the next attempt to approach (Rachman, Craske, Tallman, & Solyom, 1986). In human therapy, there has been much debate over whether engaging in "safety behavior" (behavior that makes one feel safe) is productive for therapy. It turns out that engaging in safety behaviors does not necessarily interrupt the therapeutic process, and can even reduce stress and return of fear (Goetz, 2013; Milosevic & Radomsky, 2008; Parrish, Radomsky, & Dugas, 2008).

As we work with our dogs, and sometimes even specifically train behaviors to deal with their fears, we *www.APDT.com* 

should be conscious of which kinds of coping skills will lead to rehabilitation and which will not. Parrish, et al. (2008) wrote that:

*Clients' anxiety-control strategies may be less likely to become counter-productive when: (i) they promote increases in self-efficacy,* 

(ii) they do not demand excessive attentional resources,

(iii) they enable greater approach behavior and integration of corrective information (via "disconfirmatory experiences"), and

(iv) they do not promote misattributions of safety.

Goetz (2013) suggests two categories of safety behaviors: preventative safety behaviors are attempts to avoid or reduce the intensity of a situation, and restorative safety behaviors are attempts to bring a situation back to its desired state. Avoidance would be in the preventative category and escape would be in the restorative category. Preventative safety behaviors disrupted the therapeutic process, but restorative behaviors did not. Restorative safety behaviors may be helpful for therapy and preventative safety behaviors tend to be detrimental. That means that if a dog has an experience with the trigger and moves away, you do not have to worry that this will teach the dog to be more afraid. By contrast, complete avoidance - not looking at or smelling the trigger at all, is a preventative safety behavior. Do something to prevent the need for avoidance during your training session, for example, working farther away so that your dog can comfortably engage with the trigger.

#### Why call it "BAT" and not just "desensitization"?

Many people have asked why this process is called "BAT," and not just "exposure therapy," "desensitization with controllability," or "low-intensity Pavlovian extinction." BAT is a specific technique that has been operationalized for non-human animals, so it needed its own name. It is a version of exposure therapy, a category of human anxiety therapies that can involve talking to the client, visualization, etc., done in a careful way to avoid stress beyond interest. BAT is desensitizing the dog to his triggers, but it is done in a very particular way, with the dog in control of the experience. It can't just be called desensitization. A phrase that I use that incorporates that term, Empowered Desensitization, is more accurate but still leaves out the many processes at work in BAT.

The same argument applies to extinction. I believe that a significant portion of the learning in BAT can be attributed to the process of Pavlovian extinction. However, the actual procedure of extinction can be done in extremely stressful and intrusive ways, with no controllability by the learner. It can also be done carefully to avoid overt fear responses with a high amount of learner control, as with BAT. That means we cannot just call it Pavlovian extinction, either. Besides, BAT is also *Continued on next page*  not just about fear — BAT applies to fear, frustration, and aggression. Calling this technique BAT does not change the underlying empirically demonstrated processes of extinction and controllability, but it does help specify the philosophy and technique being used and discussed.

In terms of Friedman's (2009) Humane Hierarchy,3 BAT focuses on antecedent arrangements. This is the second level of the hierarchy, after medical, nutritional, and physical changes. Changing antecedent arrangements means that we set up the situations that avoid triggering the emotion and behavior we are trying to change. This allows our learners to experience life in a new way. When we carefully arrange antecedents in this way, respondent learning (classical conditioning) can take place, in the form of desensitization.

Controllability is also an important aspect of BAT. The operant learning that happens during BAT is generally not due to reinforcement from the trainer, but from interaction with the environment. The trainer's main role is to maintain a safe space in which the dog can be comfortable to explore, limiting intrusion. The dog is able to move freely within that space, giving the dog control over naturally occurring reinforcers (NORs). When all is going well, that comes in the form of access to the trigger (R+). If the training set-up is sub-optimal and the dog feels the need to move away from the trigger, that is also allowed (R-) or intrusion is stepped up a notch to encourage movement away (redirection, R- of escape, R+ of trainer treats). Finally, the trainer is not a statue and does interact with the dog from time to

time, so there is also positive reinforcement for soliciting attention and potentially for any times the trainer praises disengagement.

#### Conclusion

This article describes BAT primarily for the rehabilitation of fear of other dogs or people, but BAT can be used for many types of (over)reactivity and with many species. BAT is also a useful technique for puppy socialization, as it allows them to experience social and other situations in a safe way. Except in very specific cases of memory reconsolidation, it is likely that we cannot erase memories, only create new ones, and it appears that original memories generalize more than subsequent revisions (Bouton, 2000). It is imperative that our puppies' first experiences of their world create positive associations, with plenty of inoculation from the predictability and controllability found in BAT.

We are in the planning stages for research to verify the effectiveness of BAT and demonstrate that it is using the principles mentioned above.4 Anecdotal evidence dogs and horses with dogs, people, and other triggers indicates that BAT gives animals an active way to observe various aspects of their triggers that leads to healthy interactions. Their low level of arousal, "happy" body language and behavior directed at their former triggers indicates that their emotional responses have changed, which are reasonable effects from desensitization, the dog's active control of the exposure to the trigger, and reinforcement directly from the trigger, promoting pro-social behavior.



Empowerment in an emotionally safe environment has always been the objective of BAT and this upgraded version allows those objectives to be realized more often in practice. Regardless of where the specifics of BAT fit into your toolbox, I hope that you include this level of maximizing empowerment and minimizing intrusiveness in your work. As trainers, we too often look for training solutions, when the real power to heal lies within the animals themselves.

#### Endnotes

1. Yes, I did just write that the clicker works as a recall cue in this situation. It does, of course, also mark acceptable behavior. In this use of the clicker, however, you are in survival mode and its most useful feature is that the dog returns to the handler for the treat or other reinforcer. That is, it is operating as a recall cue.

2. The phrase sense of agency is applied to humans, but there are arguments that agency or mammalian agency could also be applied to non-human animals as well (Panksepp, Asma, Curran, Gabriel, & Greif, 2012; Steward, 2009).

3. Note that the concept of "extinction" listed on the Humane Hierarchy is operant extinction, not the respondent (classical) learning process of the same name.

4. Additional research is very welcome, so if you are a researcher looking for a project, please contact us at

http://EmpoweredAnimals.com/contact with "Research" in the subject line.

#### References

Amat, J., Paul, E., Zarza, C., Watkins, L. R., & Maier, S. F. (2006). Previous experience with behavioral control over stress blocks the behavioral and dorsal raphe nucleus activating effects of later uncontrollable stress: role of the ventral medial prefrontal cortex. *The Journal of Neuroscience*, 26(51), 13264-13272. Chicago.

Baratta, M. V., Christianson, J. P., Gomez, D. M., Zarza, C. M., Amat, J., Masini, C. V., Watkins, L.R., & Maier, S. F. (2007). Controllable versus uncontrollable stressors bidirectionally modulate conditioned but not innate fear. *Neuroscience*, 146(4), 1495-1503.

Barlow, D. H., Agras, W. S., Leitenberg, H., & Wincze, J. P. (1970). An experimental analysis of the effectiveness of "shaping" in reducing maladaptive avoidance behavior: An analogue study. *Behaviour Research and Therapy*, 8(2), 165-173.

Bouton, M. E. (2000). A learning theory perspective on lapse, relapse, and the maintenance of behavior change. *Health Psychology*, 19(1S), 57.

Capaldi, E. D., Viveiros, D. M., & Campbell, D. H. (1983). Food as a contextual cue in counterconditioning

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experiments: Is there a counterconditioning process? *Animal Learning & Behavior*, 11(2), 213-222.

Field, A. P. (2006). Is conditioning a useful framework for understanding the development and treatment of phobias? *Clinical Psychology Review*, 26(7), 857-875.

Friedman, S. G. (2009). What's wrong with this picture? Effectiveness is not enough. *Journal of Applied Companion Animal Behavior*, 3(1), 41-45.

Goetz, A.R. The Effects of Preventative and Restorative Safety Behaviors on Contamination Fear. MS thesis University of Wisconsin Milwaukee, 2013. Retrieved from http://dc.uwm.edu/etd/251/

Gunther, L. M., Denniston, J. C., & Miller, R. R. (1998). Conducting exposure treatment in multiple contexts can prevent relapse. *Behaviour Research and Therapy*, 36(1), 75-91.

Hartley, C. A., Gorun, A., Reddan, M. C., Ramirez, F., & Phelps, E. A. (2013). Stressor controllability modulates fear extinction in humans. *Neurobiology of Learning and Memory*.

Haw, J., & Dickerson, M. (1998). The effects of distraction on desensitization and reprocessing. *Behaviour Research and Therapy*, 36(7), 765-769.

Maier, S. F., Amat, J., Baratta, M. V., Paul, E., & Watkins, L. R. (2006). Behavioral control, the medial prefrontal cortex, and resilience. *Dialogues in Clinical Neuroscience*, 8(4), 397.

Maier, S. F., & Warren, D. A. (1988). Controllability and safety signals exert dissimilar proactive effects on nociception and escape performance. *Journal of Experimental Psychology: Animal Behavior Processes*, 14(1), 18.

Maier, S. F., & Watkins, L. R. (2010). Role of the medial prefrontal cortex in coping and resilience. *Brain Research*, 1355, 52-60.

Marks, I. (1975). Behavioral treatments of phobic and obsessive compulsive disorders: A critical appraisal. In M. Hersen, R. M. Eisler, & P. M. Miller (Eds.), *Progress in Behavior Modification, vol.* 1. New York. Academic Press.

Mechiel Korte, S., & De Boer, S. F. (2003). A robust animal model of state anxiety: fear-potentiated behaviour in the elevated plus-maze. *European Journal of Pharmacology*, 463(1), 163-175.

Milosevic, I., & Radomsky, A. S. (2008). Safety behaviour does not necessarily interfere with exposure therapy. *Behaviour Research and Therapy*, 46(10), 1111-1118.

Mohlman, J., & Zinbarg, R. E. (2001). What kind of attention is necessary for fear reduction? An empirical test of the emotional processing model. Behavior Therapy, 31(1), 113-133.

Panksepp, J., Asma, S., Curran, G., Gabriel, R., & Greif, T. (2012). The philosophical implications of affective neuroscience. *Journal of Consciousness Studies*, 19(3), 6.

Parrish, C. L., Radomsky, A. S., & Dugas, M. J. (2008). Anxiety-control strategies: Is there room for neutralization in successful exposure treatment? *Clinical Psychology Review*, 28(8), 1400-1412.

Rachman, S., Craske, M., Tallman, K., & Solyom, C. (1986). Does escape behavior strengthen agoraphobic avoidance? A replication. *Behavior Therapy*, 17(4), 366-384.

Rachman, S. (1989). The return of fear: Review and prospect. *Clinical Psychology Review*, 9(2), 147-168.

Steward, H. (2009). Animal agency. Inquiry, 52(3), 217-231.

Telch, M. J., Valentiner, D. P., Ilai, D., Young, P. R., Powers, M. B., & Smits, J. A. (2004). Fear activation and distraction during the emotional processing of claustrophobic fear. *Journal of Behavior Therapy and Experimental Psychiatry*, 35(3), 219-232.

Thomas, B. L., Cutler, M., & Novak, C. (2012). A modified counterconditioning procedure prevents the renewal of conditioned fear in rats. *Learning and Motivation*, 43(1), 24-34.

Trouche, S., Sasaki, J. M., Tu, T., & Reijmers, L. G. (2013). Fear extinction causes target-specific remodeling of perisomatic inhibitory synapses. *Neuron*.

Tryon, W. W. (2005). Possible mechanisms for why desensitization and exposure therapy work. *Clinical Psychology Review*, 25(1), 67-95. Chicago.

Vervliet B, Baeyens F, Van den Bergh O, Hermans D. (2013). Extinction, generalization, and return of fear: a critical review of renewal research in humans. *Biol Psychol*, 92(1):51-8.

Wolpe, J. (1961). The systematic desensitization treatment of neurosis. *Journal of Nervous Mental Disorders*, 132, 189–203.

Yang, L., Wellman, L. L., Ambrozewicz, M. A., & Sanford, L. D. (2011). Effects of stressor predictability and controllability on sleep, temperature, and fear behavior in mice. *Sleep*, 34(6), 759.

