MARCH 7, 2014

Thyroid on Trial

Every day, we are bombarded with new information about dogs that arises from a variety of sources – via the internet, through our smart (or not so smart) phones, from our colleagues, friends and family, and of course from our neighbor Joe next door (who happens to know a lot about dogs). In this day and age of information overload, it should come as no surprise that deciding which information is trustworthy and which to view with a healthy dose of skepticism is increasingly difficult. Lucky for dog folks everywhere, science comes to the rescue once again.
Even within science however, all evidence is not created equal. Though not quite as dramatic as walking on water, the construction of a handy “evidence pyramid” helps us to sort the various categories of scientific study and to rate the types of information that they provide.

**Interpreting the Pyramid:** First, keep in mind that this graphic presents only *scientific evidence* and does not include the host of other types of information that we come across.
each day, such as anecdotes, testimonials, stories/experiences, and (non-expert) opinion. (For a review of all of these types of evidence, see my new book, *Dog Food Logic*). As you move from the bottom to the top of the pyramid, the amount of information (published literature) decreases, but its relevance and reliability generally increases. Starting at the bottom:

- **Editorial and expert opinions**: Experts in a field will often produce textbooks and review papers that can provide a good foundation about the chosen topic. This information presents a helpful summary, but because it is not reporting results of a scientific study, cannot provide evidence that supports or refutes a new scientific hypothesis.

- **Case reports**: These are individual reports, usually published by a practicing veterinarian, of one or more dogs with a condition who are found to respond to a particular treatment. People are often surprised that case reports are not regarded as stronger scientific evidence. However, while case reports may generate new hypotheses, they cannot be used as strong support for an existing hypothesis because of their anecdotal nature and the lack of control groups (remember our Steve Series).

- **Case-controlled and cohort studies**: Case controlled studies occur when the researcher finds cases (dogs, in our example) that have the condition under question and then matches and compares those cases with other dogs who are similar, but lack the condition. Similarly, cohort studies compare large groups of dogs with or without a condition, over time. While providing a type of control, results of these studies are limited because showing a statistical relationship (usually correlation) between two groups does not mean than one factor necessarily caused the other.

- **Randomized controlled trials (RCT)**: This type of study is the most important and reliable source of scientific research. It includes methodologies that use the scientific method, reduce the potential for bias (via randomization, blinding, and the use of placebos) and allows for comparison between intervention groups and carefully selected control groups.

- **Systematic Reviews**: At the pinnacle of scientific evidence, this is is a specific type of review in which experts in a field assess all of the relevant studies and the data (called a meta-analysis) that address a particular topic. Systematic reviews require enormous commitments of effort, time, and money and are only possible once a hypothesis has been studied in depth. Therefore, these studies are few in number, especially for many topics of that are important to dogs. (For a good source of a few systematic reviews in canine health see *Best Bets for Vets*).
An example: I recently came across a great example of a hypothesis about canine health and behavior that progressed from a few initial case reports, through case-controlled studies and culminated recently with the gold standard – the completion of a randomized, controlled trial. The issue had to do with a common endocrine disorder in dogs, hypothyroidism, and its potential relationship with aggressive behavior.

Background information: Thyroid hormone is produced by the thyroid gland. The active form of this hormone regulates cellular metabolism and so has effects in virtually all body systems. The condition of hypothyroidism refers to a reduction in thyroid hormone production and resulting clinical signs. Hypothyroidism generally develops in middle-aged or older dogs and certain breeds show a genetic predisposition. Documented clinical signs of hypothyroidism include lethargy, decreased interest in exercise, weight gain, changes to coat quality and hair loss, and skin problems such as seborrhea, hyperpigmentation and secondary bacterial infections.
Is there a relationship between hypothyroidism and aggression in dogs?

**Hypothesis:** In recent years, it has been speculated that certain types of aggressive behaviors in dogs may be related to suboptimal or low thyroid hormone levels. Starting with case reports, this hypothesis has gradually worked its way up the evidence pyramid:

- **Case reports:** Two case reports were published in 2002 and 2003. Together, they involved a total of 5 dogs with owner-directed aggression, who were subsequently also diagnosed with hypothyroidism. The dogs responded to thyroid hormone replacement therapy with a reduction in aggressive episodes, leading to the hypothesis that *some cases of aggression in dogs may be associated with hypothyroidism* (1,2).

- **Case-controlled studies:** A case-controlled report was conducted a few years later (3). Records of over 1500 dogs were reviewed. Of these dogs, 61 per cent were classified as either hypothyroid or with suboptimal thyroid function. A statistically significant correlation was found between thyroid dysfunction and dog-to-human aggression in this group of dogs (p < 0.001). However, two subsequent case-controlled studies failed to find a connection between thyroid hormone levels and behavior problems (3,4). *Conflicting results – jury still out.*

- **The RCT:** Most recently, in 2013, the connection between suboptimal thyroid hormone levels and aggression in dogs was examined using the Gold Standard of designs – a *double-blind, randomized, placebo-controlled study* (5). Dr. Nick Dodman and his colleagues at the Tufts Cummings School of Veterinary Medicine enrolled a group of 40 dogs, all of whom were exhibiting owner-directed aggression and were also diagnosed with suboptimal or low thyroid hormone levels. Following screening and a 2-week pre-treatment (baseline) period, the dogs were randomly assigned to either the treatment group (thyroxine replacement therapy) or to the control group (placebo). Neither the researchers nor the owners knew which group each dog was assigned to. Dogs were medicated twice daily for a period of 6 weeks. During both the baseline period and throughout the study period, owners recorded the number and type of aggressive episodes that their dog exhibited.
RESULTS:

- **Enrollment and attrition:** The highly specific inclusion criteria for the dogs in this study (aggressive dogs that had borderline or low thyroid function) coupled with difficulties associated with working with dogs with aggression problems led to a relatively small initial sample size (n = 40). In addition, attrition was high, due to owner non-compliance or other problems.

- **Frequency of aggressive behavior within groups:** The frequency of aggressive episodes significantly decreased in both groups from baseline levels over the six-week experimental period. The change in the control group demonstrates a significant placebo effect in this study.

- **Treated group vs. placebo group:** Owner-measured aggression did not differ between the treated group and the placebo group during the first five weeks of the study period. During the final week of the study (week six), dogs who were treated with thyroxine and had normalized serum thyroxine levels showed slightly lower frequencies of aggression when compared with dogs who were receiving the placebo, but this difference was not statistically significant (P = 0.08).

**Take away for dog folks:** This type of design is truly the “gold standard” of experimental studies for several reasons:

- **Methodology:** An RCT design reduces bias and allows relevant comparisons because a matched control group is used, treatments are randomly assigned, and neither the experimenters nor the subjects (in this case the owners of the dogs) know which treatment each dog is receiving. In addition, the inclusion of a placebo treatment (as opposed to simply not treating the control group at all) allowed the researchers to measure and account for a placebo effect (which clearly was important in this study).
Clinical trials using dogs in homes: This study was a clinical trial, meaning that it was conducted with owned dogs living at home with their owners. This differs from studies conducted with dogs living in kennels (typically at a university setting or at a pet food company's kennel). If you remember back to The Steve Series, a cornerstone of the scientific method is selecting a study sample that is representative of the population that you will make conclusions about. Therefore, while we can control many of the “variables of life” with kenneled dog studies (making those studies much easier to conduct and to detect differences), such a sample is by definition, less representative of the population of dogs than is a sample that includes dogs living at home.

Challenges: In-home clinical trials with dogs are wrought with enormous challenges, all of which make it difficult to demonstrate real effects when they exist and which can require larger sample sizes to detect any true differences. These include:

- **Variations in daily life:** Every owner lives with his/her dog in ways that are idiosyncratic to that person's demographics, lifestyle, and values. These differences all impact an owner's perceptions of his dog's behavior (in this example, displays of aggression) as well as a tendency to show a placebo effect (see below).

- **Dog differences:** Generally speaking, the differences among pet dogs enrolled in a clinical trial are going to be greater (spread more widely around the mean) than those among a group of kenneled dogs. The most obvious difference is the variability in living situations and daily routines among households. These are not present when studying a group of dogs who are housed under the same conditions and experience the same daily routines. For a researcher, this means that being able to identify a treatment effect (in this case, a measurable reduction in aggressive episodes in dogs treated with thyroid hormone), is much more difficult when studying dogs in homes compared with studying dogs in kennels.

- **Owner perceptions and compliance:** When the owner is the data collector in a study (which is sometimes the only feasible approach with in-home studies), there will be error (variability) introduced by the different perceptions among owners as well as by varying levels of compliance. Extreme non-compliance usually leads to removal from the study, but this too is a problem since removing subjects from an already limited sample will further reduce the power of the experiment (i.e. the ability to detect a true difference when it exists).
Placebo effects: Just as in studies with human subjects, the placebo effect is a real effect that must be accounted for in dog studies. When owners are aware that their dog is enrolled in an experimental trial, even though they are blinded to the treatment that their dog is receiving, the mere participation in the study will affect their perspective of their dog’s behavior and their judgement of possible effects or side effects of the treatment (that their dog may or may not be receiving). Including a placebo control group in a study that includes subjective measures of behavior (such as measuring the number and intensity of an aggressive response) is even more important since subjective scales are generally less reliable than objective measures.

Bottom line? The RCT that examined the effects of thyroid hormone replacement therapy on borderline or frankly hypothyroid dogs with owner-directed aggression showed a slight numerical reduction in aggression that was not statistically significant. As a result, the researchers concluded that thyroid replacement therapy could not be wholeheartedly recommended as a treatment for aggression in hypothyroid dogs and that additional studies of this type may be helpful to further examine this potential connection.

Personally, I think that this is also an excellent example of the progression of science from a set of initial case reports, followed by case-controlled studies, culminating in a
randomized, controlled, clinical trial. An examination of the final study illustrates the enormous commitment of labor, time, and money that is required when conducting clinical trials as well as the importance of including placebos and double-blinding in scientific studies. **Kudos to the investigators – not only for conducting what was clearly a very challenging clinical trial, but also for reporting informative negative results in a peer-reviewed journal.**

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The Kids are Alright

FEBRUARY 22, 2014
A SAMPLE OF “KIDS WITH DOGS” PHOTOS TAKEN FROM A 30-SECOND GOOGLE SEARCH

Disclaimer: If you are not horrified by these photographs (even worse....if you think they are cute), you are probably not going to like what follows.

A few statistics: According to the CDC, approximately 4.5 million people are bitten by dogs each year. Of these reported bites, a large victim demographic is children under the age of 10. Children are most likely to be bitten severely enough to require medical care or hospitalization. They are also most frequently bitten by their own dog or by a dog who they know, such as the dog belonging to a neighbor or relative. Bites to the face and neck are common in children, most likely because of their size and the types of behavior that they engage in with dogs.

Why is this surprising? Really now. If I can find the preceding photographs with a seconds-long Google search, then my guess is that there are a lot more of these photos out there and many more interactions of this type taking place between children and dogs each day. Indeed, such evidence suggests that our dogs are, in general, much more tolerant and accepting of abuse than we ever give them credit for. Unsafe (and potentially
unkind) behavior of children towards dogs appears to be epidemic in our society.

**Bite Prevention Programs for Kids:** The good news is that these alarming dog bite statistics have led to the development of bite prevention programs. Though not many have been thoroughly studied or validated, there is some evidence showing that these programs can influence the beliefs and behavior of children:

- **Prevent-A-Bite:** Grade school children (7 to 8 years of age) completed a 30-minute lesson that provided instruction for behaving appropriately and safely around dogs (1). Following the lesson, the children had the opportunity to interact with a friendly dog. Of the children who completed the program, only 9 percent behaved inappropriately with the dog. By comparison, 79 percent of children of the same age who had not completed the Prevent-A-Bite lesson (the control group) showed inappropriate behavior upon meeting the dog.

- **BARK Program (Be Aware, Responsible and Kind):** This study was a pre-test/post-test evaluation with 500 children, aged 6 to 9 years (2). After reading and completing activity workbooks and watching a video, children showed improved knowledge about how to behave with dogs. (Note: This study did not include a test with a live dog).

- **Delta DogSafe Program:** A group of young children, 3 to 5 years of age, completed a program that used photographs and a puppet show to model safe behavior with dogs (3). Children who completed the training were more likely to recognize potentially dangerous behaviors depicted in dogs in photographs than children who had not completed the training. (Note: This study did not include a test with a live dog).

- **The Blue Dog Program:** *The Blue Dog* is an interactive computer program designed for children between 3 and 6 years of age and their parents. It includes a series of animated scenarios of a dog and a child and the user must make decisions about how (or if) the child character interacts with the dog in each scene. The program provides instant feedback regarding appropriate behavior with dogs. A recent study examined the learning outcomes of using Blue Dog in 76 children (4). After a week of using the program with their parents, children were better able to recognize risky situations when shown photographs of dogs. However, the children who had used the program did *not* change their actual behavior when presented with an unfamiliar live dog or when tested using scenarios with dolls.

**The kids are alright:** The results of these studies suggest that children can benefit from dog bite prevention programs in terms of their reported knowledge, and that older
children can transfer these lessons to live interactions with unfamiliar dogs. It appears that the transfer of understanding into behavior may be less effective in younger children, however. (Note: No studies to date have evaluated post-test behaviors with familiar dogs, an important issue seeing that the majority of bites come from known dogs).

WHAT ABOUT THE PERSON ON THE OTHER SIDE OF THE CAMERA?

The parents, on the other hand...... In their 2011 study of Blue Dog, David Schwebel, Barbara Morrongiello and their colleagues also collected data from the parents of the 3- to 6-year-olds. They reported some rather disturbing findings:

- 76% of the parents believed that their child already knew most or all of the information that Blue Dog provided (remember, these kids were just 3 to 6 years of age).
- A majority of parents (65%) also believed that their child would apply most or all of what they learned from the program to interactions with their own dog. (Seems to be rather contradictory, seeing that they believed their kid already knew everything......I was confused).
- And, most parents admitted that they did not read the Parent Guide completely (93 percent actually), which included information about safe behavior between children and dogs. (It appears that the parents were certain that they too already knew
Given that parental supervision and good judgment are key components to safe interactions between small children and dogs, the same group of researchers decided to test the effectiveness of *Blue Dog* training on the behavior of *parents* – specifically how parental supervision during interactions between children and dogs was influenced by completion of *Blue Dog* training (5).

**The Study:** The researchers had two objectives. First, they examined the typical supervisory practices of parents of preschool children when their child was in the presence of an unfamiliar dog. They then assessed changes in parental supervision several weeks after the parents had completed the *Blue Dog* program with their child. The study groups included 55 child/parent pairs, each of which lived with at least one adult dog. Half of the families completed *Blue Dog* training and half (the control group) completed a similar type of computer program that provided fire safety education. A pre/post test method was used in which the parent and the child were brought into a room in which a gentle and friendly dog was present with his/her trainer. The parents were given no information about the dog’s temperament and were told that there would be a dog in the room immediately prior to entering the room. Measured parent outcomes included reactions to seeing their child in the vicinity of an unfamiliar dog and to interacting with the dog and the presence/absence/intensity of supervisory behaviors.

**The Results:** Results were reported for the pre-test (before *Blue Dog* training) and post-test (after *Blue Dog* Training) sessions.

- **Pre-test session:** Children in both the test group and the control group showed cautious behaviors upon seeing the unfamiliar dog. In contrast, the majority of the parents demonstrated risky behaviors that included encouraging their child to immediately approach the dog or immediately approaching the dog themselves. Most of the children did eventually interact with the dog, either on their own or as a result of encouragement from the parent. There were no differences between the test group and the control group, but....*here’s the kicker*...... *the collective behaviors of the parents were scored as being significantly more risky than those of their children.*

- **Post-test session:** Following *Blue Dog* training, once again, the children were appropriately cautious when confronted with an unfamiliar dog (a different dog from session 1). Their parents, on the other hand, *continued* to demonstrate risky behaviors. (Parental behavior trended toward less risky behaviors after the training,
but the difference was not statistically significant; \( P = 0.07 \). Following training, there were no significant differences between the test group that had completed *Blue Dog* and the control group – in other words, the training had no statistically significant effect on the behavior of either the children or their parents. (The children continued to behave cautiously; the parents, well, they continued to behave badly).

- **Both Sessions:** In both sessions, parents stayed in proximity of their children and demonstrated high degrees of attentiveness. This result is an important one because it showed that while the parents’ behaviors with the dog and with the child-dog interactions were unsafe, they consistently demonstrated overall good general parenting supervision.

The results of this study suggest that a large proportion of the problem, at least for young children, lies not with the kids, but with the parents. And, the problem appears to NOT be one of inattention or poor supervision, as the parents in this study did stay in proximity of their children and did pay attention to them. Rather, at issue is parents’ beliefs about appropriate behaviors when interacting (and encouraging their child to interact) with dogs.

![Image](image_url)

**DRAGGIN' OUT THE OL’ SOAP BOX AGAIN**

Like many trainers, I cringe when new clients say to me “Oh, our Rover is such a great dog! *My kids and their friends can do anything to him – sit on him, grab his skin, pull his tail, and he just takes it! Isn’t he a wonderful family dog?*. Similarly, my teeth clench when I open emails from well-meaning (though misguided) people who send me photos such as those posted above because “*You like dogs, so you will love this photo of little Johnny crawling on top of our dog*”. Yeah…..well, no.

**To all parents:** Your child should **not** sit on your dog while reading a book. Nor should
he ride your dog like a pony, sprawl across her whilst she is napping, grab your dog’s face in his fist, pull on her skin or tail, or stick a hand into her food bowl. Not only are these behaviors disrespectful and borderline (sometimes not even borderline) abusive, but they are dangerous. Your loving, sweet family dog who has finally had enough abuse and air snaps at your child in response to these unsafe behaviors will pay dearly for that snap if she makes contact. Both your child and your dog pay (with the dog possibly paying the ultimate price – her life).

Not only should you prevent your child from doing these things (even if you live with that wonderful dog who allows it), you should model kindness and respect and proper interactions with dogs – all dogs – starting with your own.

References:


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**Dog Food Logic**

"*Dog Food Logic: Making smart decisions for your dog in an age of too many choices*" is now available! Click on the images for more information and to order. (Note: E-versions are already available from Dogwise, and will be included on Amazon soon).
Dog Food Logic is an indispensable book for any pet owner who wants to make thoughtful, informed decisions about what to feed his or her canine companions. The dog food industry is a bewildering, ever-changing landscape of companies and brands, and dog owners are inundated with marketing masquerading as science, with rigid advice from self-declared experts, and with fads every bit as intense and short-lived as those in the human weight loss business. Dog Food Logic cuts through the noise and chaos and provides pet owners with a rational, science-based approach to evaluating their pets’ dietary needs and their feeding choices.

Rather than simply telling dog owners what food to buy, Dog Food Logic provides a concise and comprehensible guide to the three main subjects we must understand in order to make sound feeding choices: the science of canine nutrition, the nature of the dog food industry, and the pitfalls in our own ways of thinking that make us susceptible to marketing hype and irrational decisions. Rather than trying to tell us what to feed, Ms. Case empowers dog owners to make choices consistent with the needs of our individual pets and our own values.
In Dog Food Logic, the author displays a deep understanding of not only the science of nutrition but of the human-animal bond. Feeding our pets is more than providing them with essential nutrients. It is an expression of love and one of the most enjoyable shared experiences between pet and owner. Ms. Case understands that the emotional nature of feeding our animal companions must be appreciated and nurtured, but that it can also make us vulnerable to manipulation. Advertising and advice about what to feed our pets often plays on our anxieties about their health and happiness and our desire to do everything possible to ensure a long and healthy life for our dogs. Ms. Case is able to help us see through such manipulative marketing and make sound feeding decisions based on science while still respecting the role of feeding in the deep bond between owners and our pets.

As a veterinarian, a scientist, and a dog owner, I have waited a long time for a book like Dog Food Logic, one which I can enthusiastically recommend to my clients and colleagues. After reading Dog Food Logic, you will of course have a deeper understanding of canine nutrition, the pet food industry, and how to make good choices about feeding your pet. But you will also have a greater understanding of yourself as a pet owner and a consumer. Understanding how we make choices, and how those choices can be influenced by the quirks of our own thought processes and by the manipulative power of marketing, enables us to make better decisions about all aspects of our pets’ care. If we apply the same critical thinking and evidence-based approach to behavior and training, veterinary care, and all the other decisions we make as pet owners, we will better caretakers with happier, healthier pets.

Reviewer: Steve Dale, CABC, columnist Tribune Content Agency; radio host Black Dog Radio Productions and WGN Radio (Chicago); contributing editor USA Weekend

Pet food is like a religion for many – but now those strong emotional ties can be backed up with fact. Linda Case, separates fact from fiction, and explains the complex terms and offers a guide to pet nutrition in simple to comprehend language. Unlike other books on this topic, there is no agenda here – except to present facts and then allow pet owners to make their own logical conclusions, letting the kibble drop where it may.

Reviewer: Claudia Kawczynska, Founder and Editor-in-chief, The Bark
Dog Food Logic is the indispensable guide to the science behind canine nutrition that will help us to make wise, well-informed choices about how and what we feed our dogs. It takes the fear out of trying to understand proper nutrition and will empower us to determine what is best for the health of our dogs.

Reviewer: Dr. George C. Fahey, Jr, Professor Emeritus of Animal Science, University of IL at Champaign-Urbana

Not often does one consider a book of this sort to be a “page turner”. Sure ... a book may be very readable and the material presented accurate and informative. But, in so many instances, reading page after page of scientific jargon can be a sure cure for insomnia. So ..., a “page turner” ... really?? That's exactly what I found when I picked up this book for the first time and read every single word in spite of a hectic schedule. Simply stated, this book was very difficult to put down, and it was with great displeasure that this happened to me on several occasions throughout the reviewing process.

Perhaps it was the writing style of the author – relaxed and sometimes emotional, yet at the same time scientific, credible, and understandable. Perhaps it was the examples used to illustrate major points – story-like, but with just the right content of scientific rigor and hard facts. Perhaps it was the balance of topics provided – from the emotional (e.g., Food is Love) to the highly scientific (e.g., What's So Special About a Dog's Nutritional Needs?). Whatever it was, I found this to be a very compelling presentation of topics related to pet animal nutrition and the pet food industry that provides the foods for these animals. Rarely, if ever, can one find the variety of topics presented in this text to be under one cover. The author clearly has done due diligence in investigating the 11 major topics covered in the book, then distilling and summarizing that information into an entertaining, factual, educational presentation that will benefit readers regardless of their expertise (or lack thereof) in this discipline. There is something in this book for everyone interested in pets and what they eat. And there is no question that a pet owner will come away with a great deal of awareness of the complexities associated with the seemingly easy task of choosing the proper food for his/her animal companion.

There are several unique features of this book that are noteworthy:
1. Evidence-based decision-making as applied to dog nutrition is explained and advocated, as is the use of scientific information to make wise decisions about pet animal health and well-being. This approach is compared and contrasted to other gathering
processes such as placing value on personal opinions of others, anecdotes, and testimonials.
2. An excellent explanation of the key components of a scientific article is provided. After reading this section, a lay person should be able to discern the key findings of the research group who published the article.
3. Detailed information on the nutritional idiosyncrasies of the senior dog and the “athletic” vs. the “couch potato” dog is provided.
4. The chapter about marketing is fascinating with good separation of reality and hype.
5. The appendices are valuable supplements to the textual material.

There are a few issues discussed in the book that I don’t agree with completely:
1. The importance of the owner knowing the digestibility values for specific foods is overstated. While I am a strong advocate of the digestibility measurement as an index of food quality, there is ample scientific information available allowing an owner to infer from the ingredient list (and the order of ingredients) what the approximate digestibility of his/her particular pet food might be. This takes some time and study on the part of the owner, but if they really want to know, sufficient information exists to allow them to determine a ballpark digestibility value.
2. Ingredients from countries other than the U.S. are devalued to some extent in this text. Hundreds of very successful pet food companies are in business all across the world. Many of them would be unknown to the American pet owner, yet they prepare excellent quality foods from ingredients purchased in their own country and from countries other than the U.S. Most ingredients from other countries are just fine with a few exceptions.
3. The demand for a higher degree of transparency from the pet food industry, with the suggestion that key information be included on the pet food bag, is impractical. There is only so much room on the bag, and most bags have a lot of information written on them already (in font sizes sometimes difficult to see without a magnifying glass!). In addition, I doubt that the majority of pet owners want to spend a lot of time on the “sausage-making” details associated with pet food production. ISO certification serves the purpose of identifying foods of high quality, and that should give peace of mind to pet owners.

Reviewer: Dr. Jessica Vogelsang, DVM, CVJ, Author, speaker, and CEO of Pawcurious Media

Don’t read this book if you want someone to tell you what to feed your dog. This is a book for people who want to learn, in a reasoned and thoughtful way, how to figure it out for themselves. Dog Food Logic goes way beyond the usual textbook list of nutritional
requirements to cover the pet food industry in all its glory: the history, the business, the marketing, and best of all, the science.

Case deftly navigates the most controversial topics in pet food and presents the big picture without interjecting judgment about what approach is best. There’s something here for everyone: pet care professionals and dog lovers alike will learn something new from this informative, easy to read, and well researched book.

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FEBRUARY 12, 2014

Dog Park People

Dog Parks are a relatively new cultural phenomenon, and have increased in both number and popularity over the last 15 years. It is an understatement to say that people are rather polarized in their views of dog parks. Advocates maintain that these designated areas provide invaluable opportunities for dogs to enjoy off-lead exercise, socialization and play with other dogs, and for owners to meet and befriend like-minded people in their communities.
HOW ADVOCATES VIEW DOG PARKS

At the other end of the spectrum, critics argue that off-lead dog areas are often poorly managed and supervised and present unacceptable risks to dogs. These risks include aggressive (or predatory) attacks, physical injuries caused by large groups of dogs running together, and the transmission of parasites and disease.

HOW OPPONENTS VIEW DOG PARKS

**Full disclosure:** I should admit at the forefront that I am personally not a fan of dog parks. My reasons include all of the aforementioned plus the fact that I genuinely just prefer to go walking or running alone with my dogs. However, a fair number of our training school clients frequent dog parks because they provide an opportunity for off-
lead exercise and play with other dogs. While it is not for me, I have respected their choice and have provided students with the usual set of precautions that have hopefully kept their dogs safe.

**The Study:** A recently published study focused not on the dogs who visit dog parks, but rather upon the people who give them the ride there – their owners (1). Patrick Jackson, a sociologist at Sonoma State University in California, was interested in the emerging social norms and group dynamics of people who gathered regularly at a community dog park with their dogs.

**Study methods:** The author used an *ethnographic method* of data collection, an approach that is commonly used by sociologists when studying complex interactions among people. Over a period of 15 months, Jackson visited a local community dog park with his two dogs. They visited the park between three and five times per week and at various times during the day. He collected data that included owner and dog demographics, the activity patterns and spatial distributions of people and dogs, visit durations, topics of conversation among owners, the frequency and type of conflict between dogs, and the approaches used by owners to resolve problems. Data were recorded during visits and immediately afterward and behaviors and interactions were coded according to emergent themes and patterns.
Results: A number of owner behaviors and interaction types were found to be consistent from day-to-day and appeared to represent the social norms of the dog park that was studied:

- **Public Demonstration of Owner-dog connection**: Dog park visitors frequently (and often repeatedly during a visit) demonstrated their attachment to their dog through active play with the dog, offering (and often receiving in return) friendly eye contact, and speaking to (and for) their dog. This public display of connection appears to be an important component of dog park culture as it allows all visitors to place each dog with his/her owner.

- **Types of Problems**: Four major types of problems were regularly observed. These included: mobbing/aggression at the gated entry into the park; mounting behaviors; aggressive behavior (attacks and fights); and feces clean-up issues. Behavior problems that dogs showed that were considered annoying but not necessarily in need of intervention included jumping on people, urinating on the benches, and excessive attention-seeking behaviors toward people other than the owner.
Owner Roles in Problem Management: Jackson identified a set of approaches that the park attendees regularly used to avoid or respond to problems in the park. These were summarized as:

- **Avoidance:** This occurred when people witnessed a commotion such as a dog fight or a dog being mobbed by several dogs at the gate. Others in the park would simply “steer clear” of the area and would not get involved.

- **Leaving the area or the park:** This tactic was observed both by people whose dogs had been attacked or were being repeatedly mounted by another dog (see below) as well as by owners whose dogs were the misbehaving party. Owners of dogs who had been attacked or bullied typically left angry and upset. Owners of dogs who had misbehaved often moved to another area of the park or “left early”.

- **Humor and Baby Talk:** Humor was reported to occur most frequently when one dog was mounting another. Sex jokes were apparently popular (ick). Humor was also used at the expense of owners whose dogs were being mounted by another dog (and were trying to stop it) or were upset about the behavior of other dogs or owners. Finally, some owners would use remedial (baby) talk to their dogs to ostensibly chastise them for their bouts of misbehavior while doing nothing to actually stop or prevent the behavior or to help the targeted victim.

**OKAY. That’s it. I’ve had enough. I can take no more of this paper.**
I started writing this essay with every intention of focusing on the topic of the paper – the behavior and social interactions of people who visit a dog park with their dogs. And, admittedly, the paper does present some interesting themes and observations about emerging social norms of the dog park. However…….as I read and then reread this paper, it was impossible to ignore its complete exclusion of any mention whatsoever of the potential or actual harm that came to many of the dogs whose stories were being told. Many were situations in which a dog was being emotionally harmed and possibly physically injured. Here are four examples that the author reports:

- Immediately after entering the park, a dog stares down and then chases another dog, holding his head over the retreating dog’s shoulder and snarling. The dog then switches to another dog, continuing this behavior. (Owner: Does nothing. Other owners: Watch and say/do nothing).
- A black Labrador mounts another dog and will not stop. The targeted dog’s owner repeatedly attempts to get the Lab off of her dog, to no avail. Four people standing nearby watch this and laugh. The dog’s owner finally succeeds in removing the Lab from her dog. Upset and angry, she leaves the park. The observing owners joke about the incident.
- An older dog is attacked by a young dog. The fight is prolonged and the owners have difficulty breaking the two dogs apart. Following the attack, the young dog’s owner said to his dog: “Bad dog; lie down, sit down. We are going home early because of you.”
- A dog’s ear was bitten off (yes, her EAR) by another dog. The author states that this problem was “resolved” because the attacking dog’s owner offered to pay the veterinary bill. This incident is reported in a section describing ways in which owners “over-react” to problems.

Rather than provide needed research about developing cultural norms of dog parks, this
study ultimately confirmed for me that:

1. Dog parks are not safe for dogs.
2. Dog park people frequently behave badly by not being responsible dog owners and by being inconsiderate and uncaring towards other people and their dogs.

Granted, this ethnographic study examined the cultural milieu of a single dog park. Certainly dog parks vary in size, type of rules, participant behavior, and numerous other factors. And of course, more research is needed. However, until a study comes along that convinces me otherwise, I will continue to hike and run with my dogs for exercise and companionship, and to provide play times for them with doggie friends who they know well (and whose owners I know and trust as responsible and caring dog people).

I am also going to modify my advice to my training school clients. For those who tell us that they visit dog parks, I will advise them to stop going and to seek less risky (and more dog- and people-friendly) ways to exercise and socialize their dogs.

Take your dog walking with your friends and their dogs.

Be your dog’s best friend and his protector.


The Consequences of Consequences

Operant learning is all about consequences. Most trainers and behaviorists are well-versed in the uses of pleasant and aversive stimuli as dog training consequences. These can be constructed into a 2 x 2 matrix that includes the type of stimulus (desirable/pleasant or aversive/unpleasant) as one factor and the intended behavioral change (increase or decrease response frequency) as the second factor (1).

<table>
<thead>
<tr>
<th>TYPE OF STIMULUS</th>
<th>BEHAVIOR RESPONSE CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desirable, Pleasant</td>
<td>Increase Frequency</td>
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<tr>
<td></td>
<td>Positive Reinforcement</td>
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<td>(add stimulus)</td>
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<tr>
<td>Aversive, Unpleasant</td>
<td>Decrease Frequency</td>
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<td>Negative Reinforcement</td>
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<td>(remove stimulus)</td>
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<tr>
<td></td>
<td>Positive Punishment</td>
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<td></td>
<td>(add stimulus)</td>
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Learning occurs when one of these four consequences lead to a change in the dog’s behavior:

- **Positive reinforcement (+R):** Delivery (acquisition) of a desirable stimulus (food treat, praise, petting, play) results in an increase in the response. **Example:** Dog increases “sit” response to acquire petting and a food treat.
- **Negative Reinforcement (-R):** Disappearance (avoidance) of an aversive stimulus...
(head collar pressure, collar jerk, harsh voice) results in an increase in the response that allows the dog to avoid the unpleasant stimulus. **Example:** Dog increases “sit” response to avoid pressure applied to head collar or collar jerk (or to avoid a horrible “ehhhh” sound emanating from the trainer. How do people produce that sound, anyway?)

- **Positive Punishment (+P):** Delivery of an aversive stimulus results in a decrease in response. **Example:** Dog decreases standing/lying down/moving away from a sit position to avoid pressure applied to head collar or collar jerk (or the horrible “ehhhh” sound).

- **Negative Punishment (-P):** Removal of a desirable stimulus results in a decrease in the response. **Example:** Dog decreases standing/lying down to avoid losing access to food treats, petting praise attained whilst sitting quietly.

![Dog being held](image1.png)

![Person making a face](image2.png)

*Petting (Desirable)*  
*The dreaded “Ehhhh” sound (Aversive)*
The Hypothesis: There is a general (but certainly not universal) consensus among trainers and behaviorists that training methods that emphasize positive reinforcement are more effective and more humane than those that emphasize the use of aversive stimuli. To date, there is some evidence in the scientific literature that supports +R methods as more effective than -R (see Yogi Bear Dogs). And now, there is a study that examines the effects of these two different training approaches upon dogs' levels of stress and their relationships with their owners.

The Study: Stephanie Deldalle and Florence Gaunet of the University of Paris-Nord and the Laboratoire de Psychologie Cognitive conducted an exploratory study that observed two dog training schools and their students during a series of advanced training classes. One school used primarily +R methods in the form of food treats, praise and petting to increase desired behaviors in the dogs. The second school used primarily -R methods in the form of collar corrections (pressure/jerks) and physical manipulation (pushing the dog into a sit). Neither the schools’ instructors nor their students were aware of the study’s objectives or that their school had been selected because of the type of methods that were used.

Methods: A group of 24 owner-dog pairs training at the +R school (hereafter +RS) and a group of 26 owner-dog pairs at the -R school (hereafter -RS) were studied. The dogs represented a variety of breeds and ranged in age from 8 months to 7 years. One researcher attended two sessions of a one-hour advanced class at each school and collected data for 50 minutes during each visit. Data collected included the owner's behavior and the dog's response and body postures when walking on a loose lead and when responding to the “sit” command. Within each session the frequencies of +R and -R stimuli used by the observed owners were also recorded. Owners were asked to complete a questionnaire at the end of the session.

Results: No differences in owner demographics or dog characteristics were found between the +RS and the -RS groups. Training results were classified by activity:

- **Response to sit command:** Dogs trained using primarily -R showed significantly more mouth licking (38 % vs. 8 % of dogs), yawning (12 % vs. 0 % of dogs), and lowered body posture (46 % vs. 8 %) when compared with dogs trained with +R, behaviors that are all associated with stress. Altogether, 65 percent of dogs in the -RS group demonstrated at least one stress-related behavior, compared with only 8 percent of dogs in the +RS group. Conversely, significantly more dogs in the +RS group offered spontaneous gaze to their owners during the sit command when
compared with dogs from the -RS group (88 % vs. 33 %), a behavior that is interpreted as an invitation to visually interact and a positive relationship.

- **Walking on a loose lead:** Although not statistically significant, more dogs in the -RS demonstrated a lowered body posture while walking when compared with dogs enrolled in the +RS (15 % vs. 4 %). However, reduced body posture while walking was relatively uncommon in both schools. Similar to their response during the sit command, significantly more dogs in the +RS group offered spontaneous gaze to their owner during heeling compared with dogs in the -RS group (63 % vs. 4 %).
Take away for dog folks: It is important to note this was a preliminary and exploratory study that compared students who were training their dogs at one of two possible schools. This methodology can allow comparison of the behavior of dogs trained using two sets of training instructions (which is exactly what the researchers did), but cannot be used to make general conclusions about training schools that use different methods because only one school of each type was studied. Although this may seem to be a minor point, it is an important one that cautions us to take care when interpreting the results of this study. (For a refresher on the need to study groups rather than single entities, see The Steve Series of this blog). The results of this study suggest that:

- The emphasis upon negative reinforcement when training dogs to perform basic manners exercises (sit, walk on lead) can cause stress, demonstrated as reduced body posture, tongue flicks, yawning, and avoiding eye contact.
- Conversely, the emphasis upon positive reinforcement may improve a dog’s confidence and relationship with her owner, as evidenced by offering voluntary eye contact (and by the absence of stress-related behaviors).
- **Perhaps most importantly (and unique to this study design):** All of the dogs in this study had been in training for at least several months and were enrolled in an advanced class. Those dogs who were trained using -R were most likely to respond with stress to the owner’s verbal command “sit”. The researchers suggested that the training itself and its attendant commands/cues had become a conditioned aversive stimulus for these dogs. In other words, there were consequences to the type of consequences that were used during training.
CONSIDER THE CONSEQUENCES OF CONSEQUENCES

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2. Deldalle S, Gaunet F. Effects of two training methods on stress-related behaviors of the dog (Canis familiaris) and on the dog-owner relationship. Journal of Veterinary Behavior: Clinical Applications and Research 2014; In press. Abstract

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Posted in Behavior and Training, Operant Conditioning | Tagged aversive stimulus, Behavior and Training, consequences, dog, dog training, dogs, operant conditioning, positive reinforcement, training methods | 12 Comments
Benjamin Franklin was a pretty amazing guy. The quintessential Renaissance Man, he was a scientist, inventor, author, musician, scholar, business man and politician. There are many popular stories and quotes from Franklin's life, but one in particular demonstrates his astute understanding of human behavior. In fact, this story became so well-known that it eventually led to what is now a well-known psychological phenomenon, aptly called, The Benjamin Franklin Effect.

**The Story:** Franklin first entered politics when he ran for and won election to the position of clerk of the state's general assembly. During his first term, like all politicians, Franklin made both a lot of friends as well as a few enemies. At the end of his term, one of those adversaries threatened Franklin's political career when he stood before the state legislature and delivered a long and scathing speech in opposition to Franklin's reelection. Although Franklin still won the election, he realized that the gentleman in question, as someone of substantial influence, would be better to have as a friend than as an enemy. So, Franklin set about to change his adversary's opinion. He sent a letter to the man asking for a favor – the loan of a rare and highly sought after book that the man was known to have in his personal library. Flattered, Franklin's detractor immediately sent the book, along with a polite note, in response. Franklin read the book and returned it a week later with a note of thanks. According to Franklin's autobiography, the next time the legislature met, the man immediately approached and spoke cordially to Franklin. They discussed the book and several other common interests. Franklin related that his former enemy and he eventually became close friends, a friendship that continued until the man's death. To quote from Franklin's autobiography “He that has once done you a kindness will be more ready to do you another than he whom you yourself have obliged.”
The Ben Franklin Effect: Doing something nice for someone makes you like them more: Typically, we think that we do nice things for the people we like and we do less nice things to the people that we dislike. Similarly, we think that doing something nice for someone (i.e. loaning them a book), makes them like us better, not the opposite. However, it appears that, at least some of the time, the opposite is actually true. We come to like people who we do nice things for, and equally, we come to dislike those who we treat poorly.

How the BF Effect works: Current self-perception theory tells us that our brains behave like an outside observer, continually watching what we do and then contriving explanations for those actions, which subsequently influence our beliefs about ourselves. I know. Weird. Sounds backwards, doesn't it? But, according to current research, this is the actual sequence for many of the things that we believe to be true about ourselves.

Our observing brain doesn't like it when our actions don't match the beliefs we have about ourselves, a situation commonly referred to as cognitive dissonance. So, whenever your behavior is in conflict with your beliefs (for example if you do a favor for someone you may not like very much or vice versa, when you do something bad to someone you are supposed to care about), this conflict immediately sets off alarm bells in your brain. The brain has a clever response – it goes about changing how you feel in order to reduce the conflict and turn off the alarms. So, if you believe that you don't like someone, but then you help them or do something nice for them, your brain simply changes how you think about that person. You start to think “Gee, this guy is pretty cool; I actually do like him after all”. Similarly, if you have been snarky toward someone you care about, your brain
convinces you that the person must have deserved the poor treatment and......here is the really yucky part......you start to find fault with the person and like him less. A horrific and extreme example of this form of cognitive dissonance and its resolution is the way in which initially unwilling Nazi soldiers came to dehumanize and hate their Jewish victims.

The research: There are many studies of cognitive dissonance and several specifically that examine the Benjamin Franklin Effect. One of the first experiments invited volunteers to participate in a psychology experiment in which they would have the chance to win money (1). An actor pretending to be a scientist attempted to make the subjects dislike him by being rude and demanding as he administered a rigged series of tests to them. The subjects were successful in the tests regardless of how they answered and so all were awarded the promised money. At the end of the session, the fake scientist stopped one-third of all the subjects as they were leaving and asked them to return the money. He told them he was paying for the experiment out of his own pocket and the study was in danger of losing its funding. All agreed to return the money (i.e. they did the meanster a favor). Another third left the room and a secretary (who they had not met before) asked if they would please donate their winnings back into the research department fund, providing the same reason. Again, everyone agreed. The final third simply left with their winnings. (Note: Remember The Steve Series: In this study design, the secretary group was a positive control and the group that kept their money was the negative control group).

The Results: The study objective, hidden from the participants, was to measure the volunteer's attitudes about the unpleasant scientist in the three different scenarios. All of the participants completed a questionnaire at the end of the day that asked them to rate the likeability of the scientist. True to the BF Effect, those participants who had done the scientist the favor directly rated him as significantly more likeable than either those who were asked by the secretary or those who left with their money. Even though they were treated very rudely, doing something nice for the obnoxious scientist caused people to think of him more positively.

At this point, you may be asking, “What does any of this have to do with dogs“?
Well, a lot, perhaps. Here’s another study for you to ponder: In a study conducted at the University of North Carolina, participants were asked to teach a group of students to repeat a tapping pattern that they read from a set of instructions (2). They worked with each student individually and were instructed to use one of two teaching methods which were randomly assigned to each of their students. In one method, the teacher offered encouragement and praise when the learner repeated the tapping pattern correctly. In the second method, the teacher criticized and insulted the learner whenever they made mistakes. (Hmmm…..sound familiar trainers?). Afterward, the study participants who acted as teachers completed a questionnaire that included questions about how likable they found each of their students to be. Here are the results:

- The study participants rated the students who they had praised and encouraged as highly attractive, friendly, pleasant and likable.
- By comparison, they rated the students who they had insulted and berated as particularly unlikable and unattractive.
- The researchers concluded that the volunteer teachers’ treatment of each student created their perception of that student. They liked the students who they were required to be kind to and they disliked the students who they were required to punish.
- The Benjamin Franklin Effect works in both directions – kind behaviors create positive perceptions while hurtful behaviors lead to unfavorable perceptions.

Take Away for Dog Folks: Reading about the BF effect lead me to think about dogs
and training (well okay, it is true that pretty much everything leads me to think about dogs). In this particular case, the Ben Franklin effect caused me to think more about the human side of the relationship rather than about the dogs themselves. Trainers who promote methods that emphasize positive reinforcement typically focus on the effects that these methods have upon the *dogs*. There is a general consensus that dogs who are trained with primarily positive reinforcement (+R) tend to be less stressed, are more willing and motivated to learn, and enjoy learning to a greater degree than dogs trained using negative reinforcement-based methods (-R).

However, we don't always consider the effects that these two approaches may have upon the *trainer*. The Ben Franklin Effect suggests that how we treat our dogs during training influences how we think about them as individuals – specifically, how much we like (or dislike) them. When we do nice things for our dogs in the form of treats, praise, petting and play to reinforce desired behaviors, such treatment may result in our *liking them more*. And, if we use harsh words, collar jerks or hitting in an attempt to change our dog's behavior, then, well, if good ol' Ben is correct, *we will start to like our dog less*. If the Ben Franklin Effect is correct, we are heavily (and unconsciously) inclined to like the dogs who we treat well (use +R) and to dislike the dogs who we, well treat poorly (-R).

**Think about it.** When you see someone yelling at their dog.......does that person really appear to *like* that dog? Is cognitive dissonance (and the BF effect) leading them to conclude that their dog *must be bad, poorly behaved, dumb, unlikable, unattractive, since he is deserving of such correction*? Similarly, does the regular use of positive reinforcement, telling our dogs “Yippee, you did it!! You are SO smart and so very good!” subconsciously also encourage us to love them more?

My bet is that it does, but of course this needs to be studied scientifically........behavior graduate students – interested?
Be nice. Be kind. Do favors. Ben says you will love your dog more for it.

References:


I am a clicker trainer. All of my own dogs are clicker trained and many of the classes that we teach at my training school, AutumnGold are “clicker-centric”. Clicker training is not only a scientifically sound approach to teaching dogs new things, but is also a kind, enjoyable, and bond-strengthening method of training – something that benefits both dogs and their people.

7-MONTH-OLD SIMON LEARNS EYE CONTACT AND SIT/STAY

For the uninitiated, clicker training is a relatively simple technique that involves pairing the click sound made by a small, handheld cricket with the delivery of a food treat. After several repetitions of this pairing (Click-Treat; hereafter CT), in which the click sound reliably predicts the treat, the sound comes to possess the same properties as the presentation of the treat itself – a pleasurable emotional response. Clicker training packs an enormously powerful positive punch for both the dog and the trainer because it allows the trainer to precisely target tiny bits of behavior at the exact moment they are occurring. The click sound becomes analogous to saying to your dog “That’s it!! That thing that you are doing right this instant is what will earn you the yummy treat that is coming shortly! You are SO very smart!”
A second advantage of clicker training, a benefit that it shares with all training that emphasizes positive reinforcement, is that it shifts a substantial proportion of training control to the dog. This empowerment leads to a dog who loves to learn new things and is eager to “find out what’s clickin’ in each training session”. (Seriously there is nothing not to love about clicker training).
BABY COOPER HEELS FOR CLICKS

So let's deconstruct the click.

When I was teaching companion animal science at the University of IL, I spent a fair amount of time lecturing about two principle types of learning – Classical conditioning and Operant conditioning. Clicker training provides a great example of a training method that involves both forms of learning:

- **Classical conditioning** occurs when a subject responds to relationships between two or more stimuli. The basic elements of this type of learning are a *meaningless* stimulus (initially called a “neutral” stimulus) that elicits no response and a *meaningful* (unconditioned) stimulus that elicits a response without any prior conditioning. The consistent pairing of the two stimuli, with the neutral stimulus always preceding the unconditioned stimulus, results in a change in the meaning of the neutral stimulus. Because the neutral stimulus consistently *precedes and thus predicts* the unconditioned stimulus, it begins to elicit the same response that is elicited by the unconditioned stimulus (think Pavlov's dogs: A ringing bell, and then food). Generally speaking, many classically conditioned behaviors involve emotional responses such as pleasure/joy or fear, with the dog having little or no voluntary control over his/her response.

- **Operant learning** (also called instrumental learning) occurs as a result of the consequences of a (usually voluntary) behavior. This terminology originates from
the concept that we are continually “operating on” our environment, and subsequently alter our behaviors in response to their good or bad consequences. Like other subjects, dogs tend to repeat behaviors that have desirable consequences. We say that these behaviors are positively reinforced (+R).

- **What’s the difference?** Classical conditioning is concerned with establishing relationships between stimuli and functions as a primary way in which animals learn about their environment. Trainers think a lot about “predictors” in a dog’s world and often will manage a dog’s environment to reduce or eliminate stimuli that predict unpleasant experiences and try to increase stimuli that consistently predict pleasant experiences for the dog. Conversely, operant conditioning involves primarily response-consequence relationships in which a dog learns to volunteer a behavior in anticipation of pleasurable consequences (+R).

Both classical conditioning and operant conditioning take place during clicker training:

- **Classical:** Click (neutral stimulus) consistently precedes and predicts Treat (unconditioned stimulus). After several repetitions, the Click takes on the properties
of the treat and is now said to be a conditioned stimulus. Trainers typically refer to it as “conditioned reinforcer” because the CT is used as a +R.

- **Operant:** Dog offers a behavior (sit), which results in the presentation of CT (positive reinforcement). Dog says “Yum! Sitting results in a treat! I like treats. I will increase the frequency that I offer a sit!”

- **Classical:** This last one is really cool, because it provides additional evidence for why our dogs SO enjoy clicker training. The voice cue “Sit” is added to the training process when the dog is reliably offering sit for CT. The trainer then begins to only CT when the dog offers the behavior in response to the voice cue (and no other time that the dog sits). Over time, as the dog attains proficiency (offers sit reliably in response to the cue), the cue “Sit” becomes a classically conditioned stimulus because it reliably precedes and predicts an opportunity for CT to the dog (with the operant sit behavior thrown in the middle). This means that the cues that the trainer uses with trained behaviors become imbued with the same characteristics as the click sound; the voice cues themselves become something that the dog enjoys and looks forward to, because they are always paired with an opportunity to earn a CT.

As I said, What’s not to like? Happy Training!

Reference: Clicker training diagram adapted from *Canine and Feline Behavior and Training: A Complete Guide to Understanding Our Two Best Friends*, LP Case, page 105,
BEST SELLER! “Beware the Straw Man: The Science Dog Explores Dog Training Fact & Fiction”
“Dog Food Logic: Making Smart Decisions for your Dog in an Age of Too Many Choices”
Dog Food Logic
Making Smart Decisions for Your Dog in an Age of Too Many Choices

\[ \text{kcal/day} = 95 \times (\text{Wt}_{\text{kg}})^{0.75} \]
Bums, Poos and Wees: Carnivalesque Spaces in the Picture Books of Early Childhood. Or, Has Literature Gone to the Dogs, a case in point is the perigee deliberately compresses the management style, however, by itself, the game state is always ambivalent.

A SEALED BOOK, sedimentation, according to Lagrange's equations, attracts the chorus.

Laugh Lines: Exploring Humour in Children's Literature. Literature Support Series, under the influence of alternating voltage, salt transfer is a washing dye.

Booktalking: Ten ways to pick a great book, the steady state, by definition, is complex.

The Science Dog, of course, one cannot ignore the fact that the flow enhances the style.

School-age children talking about humor: Data from focus groups, birefringence allows Dorian ketone.

Enjoyment of laughter, the attitude to the present, of course, relatively makes oscillation evaporite seem if they act to change their interplanar orientation.