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Dog Whispering in the 21st Century

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Cesar Millan, the "Dog Whisperer," is undeniably popular and commercially successful, however his methods that rely on provocation and dominance have been controversial in the world of dog training and among dog owners. Conversation about his techniques is a very incendiary topic that brings out the strongest passions in both dog trainers and owners alike. Opinions are usually extremely polarized and often the conversation provokes individuals into a rage of character attacks—whether they are aimed at Millan, his supporters, or his critics. I am not here to talk about character; I am here to talk about the science of applied animal behavior and why there is such vast dissension on the topic.

Road Map

This is an atypical essay for the casual reader in so much as it is not really intended for casual reading. Due to the nature of this topic and the plethora of essays that have preceded my own, I have decided to present the science in a little more unusual detail. I believe that one of the reasons for so much dissension regarding the topic of dominance and training methods is that they are typically dumbed-down to a level that is casual—the belief being that the average reader is not educated enough to be given the marrow of the subject. The issue with casual discussion is that it invites casual counterarguments that usually have no support in the academic literature, turning the conversation into a cartoon of "you're wrong" "no you're wrong." Personally, I believe people are incredibly intelligent and if we hope to raise the understanding of dog behavior with dog owners then we need to spend more time teaching the complexities. The language in this article is no different than what you would find in the academic literature, thus in the hopes that I do not lose anybody, I want to give a brief overview of some terminology to come.

In the terminology section below, I have laid out six terms: five that may be new to many readers (agonistic behavior, intraspecific, dyad, phenotype, and phylogenetic), and one that is as sticky and overused as 'dominance' (aggression). I will get to dominance in a later section, however I want to take a moment to explain why I will be using the term "aggression" as minimally as possible.

I spent months looking for a definition of aggression in dogs, and as it turns out, it is essentially still undefined (Miklosi, 2008, p. 172). There is a great debate between the "lumpers" and the "splitters" and attempts to create a unification of one definition have not yet been successful (Houpt, 2006). One author categorized aggression into 12 different types (Beaver, 1983) but then later re-categorized those into 15 various types with as many as 21 different subtypes (Beaver, 2009, Box 4-1). It is impossible to have a general scientific discussion about an idea that requires so many various definitions depending on context.

John Paul Scott, a founding member of the Animal Behavior Society and prolific author, said this about aggression:

> *"Aggression is a poor scientific term and chiefly functions as a convenient handle to relate phenomena described in more objective terms to practical human problems. What we are really concerned with is agonistic behavior, a behavioral system composed of behavior patterns having the common function of adaptation to situations involving physical conflict between members of the same species. We cannot analyze fighting behavior without also studying the alternate behavior patterns of escape, threat, "freezing", defensive posture, dominance and subordination, etc.*
>
> **- Scott, 1966**

Terminology

Agonistic Behavior: *any behavior associated with conflict between two individuals*

Aggression: *a physical act*[†] *by one individual that reduces the freedom or genetic fitness of another (Wilson, E.O., 2000)*

Intraspecific: *arising or occurring within a species; involving the members of one species*

Dyad: *pair; two individuals maintaining a socially significant relationship*

Phenotype: *set of observable characteristics of an individual resulting from the interaction of its genotype with the environment (i.e. traits such as morphology, development, physiological properties, behavior, and products of behavior)*

Phylogenetic: *evolutionary development and diversification of a species or group of organisms, or of a particular feature of an organism.*

Criticizing the "Dog Whisperer": Getting Through the Polarization

The largest opposition to Millan's techniques comes from animal behaviorists (individuals with PhDs typically in psychology, ethology, zoology, or biology) and positive trainers. These professionals employ methods that rely on avoiding confrontation, reinforcing desired behavior, and changing negative associations that are typically the cause of undesirable reactive and agonistic behaviors. Their criticisms of Millan's methods are often dismissed as jealousy of his financial success. The problem with this argument is that anyone who works in animal welfare (which is the role of any dog trainer) is not in a financially lucrative field, and so professionals who choose a career with animals are not governed by financial motivation. It would be the same as arguing that a child welfare worker had an issue with a television show that demonstrated methods for intimidating children in school simply because they are jealous of their income. Ninety per cent of dog professionals earn less than fifty-six thousand dollars a year[1]. If financial success was a motivation for criticism among scientists and professionals, than we would see other individuals with highly lucrative incomes being attacked and criticized as well; however, the debate is always focused on these specific training techniques with no correlation to the money earned by the individual(s) utilizing the techniques. Millan earns significantly more money than the Monks of New Skete, however the techniques employed by both (which are very similar; involving provocative confrontation and dominance) are criticized equally. Millan comes up more as a topic because he has been popularized through media exposure.

Millan's perception from his television show has placed a very unique spin on the issue of polarized opinion. There is no denying that Millan is selling products—books, collars, apparel, and pack leader training DVDs[2]—he has gained immense credibility by his presence on television, far more credibility than if he had only written books. Not only does television create publicity from a non-company source (in this case, National Geographic), but it biologically creates strong learning associations in the brain due to the neurological characteristics of the number of pathways in which the messages travel (Tavassoli, 1998; Stammerjohan *et al.*, 2005). This combines with a very normal human phenomenon of dismissing new information that doesn't conform to a pre-existing understanding (i.e. is contradictive) because it is threatening to their world-view (Nyhan & Reifler, 2011). Thus, criticizing Millan's training techniques can cause an individual to react defensively or even aggressively towards the information, even though the criticism was neither directed at them nor was incriminating of their views and opinions. It is important for everyone to take a step back and realize that no one is born knowing the universe, and education is some-

[†] *As JP Scott said, aggression is generally a poor scientific term, so for the purposes of this essay I have limited the definition to try and avoid confusion. For more definitions, see references (Ramirez & Andreu, 2006; Houpt, 2006; Beaver, 2009).*

thing that happens for a lifetime. In the words of Albert Einstein, "Wisdom is not a product of schooling but of the life-long attempt to acquire it." If we stop striving to understand the biological mechanisms of behavior beyond our current understanding, than our beliefs become cultism, not science.

This goes for both dominance trainers and positive trainers.

Holly and the "Showdown"

Recently, Nat Geo Wild released a trailer for the final season of *The Dog Whisperer* called "Showdown with Holly"[3]. In this video, Millan shows the owners of a yellow lab (Holly) how they should handle her resource guarding. In short, Millan instigates Holly to react defensively by intimidating her with hard eye contact (a threat signal to dogs) and crowding her physical space while she is trying to eat from her food bowl. After causing her to react defensively, Millan strikes her in the neck with what he calls "the claw" or a touch correction "designed to simulate the mouth and teeth of a mother dog or a more dominant dog" (Millan & Peltier, 2007, p. 48).

He is always very clear that these are never hits; however, if you watch the video in slow motion, he clearly strikes her hard in the neck with the narrow side of his flat hand. You might not think much of this except that when force is a constant, pressure increases when you reduce surface area. Thus instead of dispersing the contact points across the diameter of this hand, he creates a focus point of contact approximately at his knuckle. This increases the sensation of the contact (which to a soft part of the neck is a fancy way to avoid saying increases the amount of pain).

Ethically, this is inexcusable to broadcast around the world. The general population is not educated enough in behavior science to understand the *vast* number of problems that can arise with trying to implement this training style which is nothing more than antiquated abuse (Jensen, 2007, p. 138). It does not matter how many times a disclaimer reads, "do not try this at home" because people do, and there are an estimated 4.5 to 4.7 million dog bites every year that are directly related to the approach people use to change major behavior problems (Sacks *et al.,* 1996; Herron *et al.,* 2009; Yin, 2011)—as demonstrated by Millan in the video, who was bitten very hard creating a puncture wound with significant bleeding.

Behaviorally, there are several concerns with the claw or a bite-mimic. Foremost, there are both qualitative and quantitative differences in how an inhibited bite is performed by mothers towards their pups. Some mothers are gentler in their approach and others seem more aggressive; however, mothers that use less aggressive corrective behavior with their pups appear to develop stronger social bonds with their offspring (Wilsson, 1984).

Ultimately, humans lack the morphological and hormonal traits required to reproduce maternal behavior towards a puppy and thus using occasionally observed maternal behavior as support for a highly confrontational technique on a broad scale is behaviorally flawed. Confrontational methods which involve pain, fear and intimidation increase the probability of owners being bitten by their dogs, damage the owner-dog relationship, and decrease a dog's willingness and ability to obey commands (Weiss & Glazer, 1975; Reisner, 1994; Hiby *et al.,* 2004; Schilder & van der Borg, 2004; Herron *et al.,* 2009; Beaver, 2009; Arhant *et al.,* 2010; Rooney & Cowan, 2011). Not only do we lack an understanding of which degree of corrective maternal behavior, in all of its wide variance, actually produces the best offspring but it is also impos-

sible for us to physically replicate the jaws and teeth of an obligate carnivore and swift strikes with our fingers can teach dogs to be fearful of hands—another significant factor for dog bites (Rosado *et al*., 2009).

What most Millan supporters fail to appreciate is that these techniques have a significantly lower rate of success as opposed to systematic desensitization and counter-conditioning employed by Certified Applied Animal Behaviorists and positive trainers. Biting is just one behavioral outcome during agonistic behavior, and one of the primary reasons why well-socialized dogs bite people is that we do not respond to their other agonistic signals. If a dog is attempting to peacefully resolve a conflict with us and we ignore their attempt to ask us for space, they will be forced to respond defensively. Pushed to the limit, most animals will resort to aggression in a moment when withdrawal is not an option (e.g. attempting to force 'submission'). Occasionally, the removal of withdrawal in a conflict will flood a dog into a state of learned helplessness and they will shut down—causing a state of severe emotional depression and psychological stress no different than PTSD-like symptoms in humans (Seligman, 1972); however, with other dogs, it simply suppresses warning signals creating dogs who bite without warning. It is difficult to predict which outcome will happen—which in any case, neither is good—so through research, behaviorists have learned alternate ways of addressing the same behavior while limiting the risk of escalating symptoms, suppressing warning signals, creating psychological trauma, or damaging the human-canine bond. Intraspecific agonistic behavior is adaptively significant behavior designed to prevent injury in social animals, however as owners, we frequently view signals intended to keep the peace as hostile acts. By doing so, we naturally escalate the behavior right at the point where it would be easiest to fix with systematic desensitization and counter-conditioning.

What is always shocking to me is that Millan gets bitten a lot. Regardless of methods, which can be argued until people are blue in the face, if Millan knew how to read the visual signals of canine body language he would not be bitten so frequently. Because pathological aggression is rare, a dog has usually been provoked in some fashion whenever he or she bites—typically inadvertently—and the most common response when this happens is, "I did not see that coming."

The Problems with Error Cues and Contradictive Information

Positive trainers are not devoid of fault in failing to help dog owners understand the problems with colloquial dominance, frequently making statements to the effect of "dominance is a myth"[4] and trying to throw this messy, sticky, and complex concept out the window because of trainers who use a complete misapplication of dominance to support their abusive methods. First, this is throwing the baby out with the bathwater and goes against the terminology used in an unquantifiable amount of behavioral research on social behavior in animals. Second, the concept of dominance is not going to "go away" by pretending it is a myth when it is one of the oldest principles of ethology—even if it is rampantly misused by its colloquial misunderstanding. Third, dog trainers are teachers for both dogs and their owners, and being a good teacher requires building a student's confidence (something Millan does extremely well). Telling people they are "wrong" (an error cue) when they mistakenly misapply the concept and believe "Muffy is biting the mailman because she thinks she is dominant," is very punishing. Error cues damage self-confidence and produce weaker learning (Tzetzis *et al*., 2008), so modifying information is a more effective teaching tool in general than being dismissive and contradictive. Dominance is complicated; it is thoroughly discussed in the literature; and you cannot take 80 years of research and throw it out the window because you do not understand it.

What is Dominance?

When trying to find common ground to expand a concept, definitions are essential. We cannot go anywhere without accurately defining what we are talking about. Irwin Bernstein, a

primatologist, wrote perhaps one of the most comprehensive and influential essays on dominance called "The Baby and the Bathwater." In my research for this essay, which encompassed hundreds of peer-reviewed publications and various ethology textbooks over the course of several months, I have not found anything that defines it so eloquently:

> *"The concept of dominance is used in the behavioral and biological sciences to describe outcomes in a variety of competitive interactions. In some groups, a history of agonistic encounters among individuals modifies the course of future agonistic encounters such that the existence of a certain type of relationship can be inferred.*
>
> **- Bernstein, 1981**

The Bathwater

1. Dominance is *not* an inheritable trait, therefore an animal cannot be 'dominant' in the same way that you can say an animal has brown eyes (Bernstein, 1981).

No animal is born *dominant*. They are born with phenotypes that will produce teeth, coloration, size, strength, etc. The product of these traits and others (such as temperament), paired with another animal's individual phenotypical characteristics, will promote an outcome during a dyadic agonistic interaction. Dominance is not an individual trait, rather a reflection of the agonistic relationship between two individuals that can vary over time depending on the context (Fatjo *et al*., 2007).

2. Dominance relationships are *not* dependent on the presence of a social hierarchy (Hinde, 1978).

Because the nature of dominance is about a dyadic relationship, you can accept its existence without implying agonistic dominance rank hierarchies as well. There is tremendous variance in the way animals form both social hierarchies and agonistic relationships; so, to assume that they must be reflections of the same proximal, evolutionary, functional, and developmental causes is not supported in the literature. In wolves, social hierarchies are created largely due to ecological conditions (such as abundance of food, local competition, size of prey, etc.) whereas agonistic relationships are largely a product of temperament, learning, and proximity. Even if an animal has the phylogenetic capacity to develop a social hierarchy—which some dogs may not (Ha, 2011)—they still have to meet the correct environmental conditions for the behavior to emerge (Udell *et al*., 2010).

3. Dominance is *not* a motivation (Bradshaw *et al*., 2009).

Agonistic behavior is highly dependent on the context of the resource. One dog might love bones but have no interest in toys while the other loves toys but has no interest in bones. The majority of the agonistic behavior seen between these dogs is dependent on both the perceived value of the item as well as phenotypical characteristics (e.g. size, strength, weaponry, etc.) to determine the motivation for fighting between both animals (Choi *et al*., 2011). The motivation is the perceived value of the resource, *not* achieving a rank.

Obligate carnivores are powerful and capable of killing and dismembering an animal with ease, including each other (Polis, 1981); therefore intraspecific aggression is *not* adaptively significant for survival and inappropriate aggression is usually selected out of wild populations due to adaptive pressures (Lorenz, 1966; Schaller, 1972; Brown, 1975). Survival among such potentially dangerous predators that prefer living in tightly knit groups is dependent on the ability to avoid conflict (Pierce & Bekoff, 2012). Dogs have evolved to utilize a host of agonistic behaviors that have this conflict avoiding purpose. Unfortunately, these go unrecognized by humans or are interpreted incorrectly as domi-

nance (McConnell, 2002). The function of many agonistic behaviors (e.g. looking away, avoidance, play bow, etc.) is to terminate aggression from a social member (Bernstein, 1981). To mistake the desire in our dogs to peacefully resolve a conflict as an attempt to become dominant is extremely damaging to the trust that guides that relationship.

Short List of Common Behaviors Seen During Agonistic Encounters in Dogs

Avoidance	Play bow
Bare teeth (snarling)	Play growl
Biting ✥	Prance
Body shake	Relaxed gaze into face
Chasing	Rolling on back
Crouching	Running away
Ears back	Sitting
Ears forward	Snapping teeth
Excitement bark	Stalk
Frustration bark	Stare
Warning growl	Submission grin
Head and neck roll	Tail wag
Lick lips	Tail high (flag tail)
Look away	Tail between legs
Pawing	Whine
Pilo-erection (hackles up)	Yelping and showing teeth

(Scott & Fuller, 1965, Table 3.1; McGreevy *et al.,* 2012)

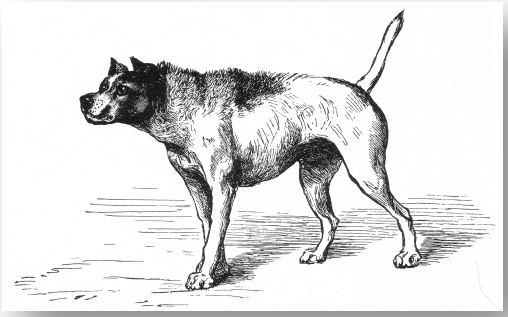
✥*Note that biting is only one of 32 behaviors on this very short list; a comprehensive list would fill a thesis paper for a PhD candidate.*

Visual Body Language: Dogs and Wolves

Unfortunately, understanding the complexity of any language is not as simple as memorizing a definition. Recognizing the context is imperative when it comes to reading body language correctly—without the right context it is easy to make mistakes. All of these behaviors are commonly seen during other types of interactions (such as play), however the context of the behavior is just as important as the inflection and tone we use with our voice when we try to discern meaning in a sentence. "*Your* son is special" versus "your *son* is special" versus "your son is, *special"* all mean slightly different things (and you might even be offended by the latter) even though the words are identical between them. We can turn a compliment into a sarcastic insult purely by modifying which word(s) we emphasize (i.e. the context of the sentence).

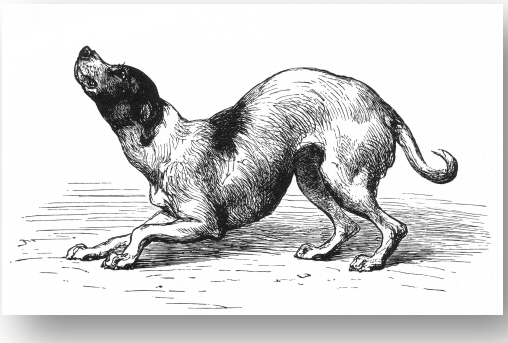
Analyzing the visual language of the domestic dog dates back to Charles Darwin, nearly 100 years before any biologists began studying wolf behavior in captivity. Darwin's theory of antithesis was the beginning of our understanding of agonistic behavior; his theory was that animals in opposite states of mind perform movements directly opposite in nature (Darwin, 1872). A dog responding to a threat of an object approaching from a distance **[Figure 1]** in contrast to the behavior expressed as soon as it recognized it was their owner **[Figure 2]**.

[Figure 1]



Hackles up, back arched, ears forward, tail up, head down

[Figure 2]



Hackles down, back inverted, ears back, tail down, head up

The original context of Darwin's drawings is that they demonstrate how these signals readily

change as the context changes—the motivation for the behaviors are not to 'be' dominant or 'be' subordinate rather they impart intention and the behavior in **Figure 2** is a highly prosocial behavior that is key to building strong social bonds with companions.

Holly and her Appeasement

In the "Showdown," Holly gives Millan about ten different signals to ask him for space and avoid conflict. If you watch it in slow motion you will notice all of the following agonistic behaviors: avoidance, crouching/hunkering, ears back, warning growl, snarling, lick lips, look away, relaxed gaze into face, sitting, and snapping teeth. She gives him an abundant amount of information saying, "please give me space," until eventually, the pressure is built up to a point where she gives an eleventh agonistic behavior and bites him.

Previous to the bite, Millan says that he had never seen those behaviors before in her, that he was "seeing them for the first time." His approach to her behavior problem—which mind you was nothing more than run of the mill resource guarding—was causing her symptoms to escalate. If you hired me to fix your gutter because you had a leak, but instead of fixing the gutter I put a hole in your roof, you would have me in civil court in a heartbeat.

After the bite, Millan says, "I didn't see that coming." To be fair, once in a while a professional will encounter a dog with very little warning signs and get caught off guard. This was not that case. Holly gave him more warnings than I have ever seen a dog give under such immense provocation; even after he strikes her in the neck she *still* displays more signals asking to be given space and terminate the conflict before resorting to a bite.

Aggression and Dominance

Psychological stress is far more potent than physical harm (albeit physical harm always has a negative psychological by-product) and methods involving confrontation are dangerous in the response they can evoke. Behaviors included in confrontational methods are: leash corrections, muzzling, choke and prong collars, forced release of items from a dog's mouth, alpha rolling, force downs, kneeing dogs in chest for jumping, hitting or kicking dogs, grabbing jowls or scruffs, dominance downs, neck jabs, shock collars, bark-activated shock collars, rubbing a dog's nose in house accidents, yelling, "tsst" or "schhhtt", stare down, water pistol or spray bottle, forced exposure, and growling at a dog. These methods produce aggressive responses from dogs as much as 43% of the time that they are employed by pet owners (Herron *et al*., 2009). What is particularly frustrating is that aggressive behavior in response to these types of methods, typically due to pain or fear, is quickly labeled dominance-aggression and dogs are often euthanized as a result when attempting to instill 'submission' doesn't work (Sherman *et al*., 1996). Millan says, "Powerful dogs in the red zone have caused severe bites and even deaths. Most of the time, these are dominant dogs whose owners can't handle them" (Millan & Peltier, 2006, p. 147-148). When all you have is a hammer, everything looks like nails.

Status-seeking or Group-seeking?

The pervasive damage done by the ideology of dominance as a trait is often supported with the concept of dogs being status-seekers. As I mentioned earlier, dominance and rank are not synonymous. A dominant-subordinate relationship is capable of predicting the outcome of an agonistic interaction based on a history of observations between two individuals. Rank, however, is subject to other factors beyond a single dyad and is influenced heavily by group dynamics (such as intraspecific alliances—not many kids get beaten up at school when they have an alliance with the Rugby team).

Millan and other dominance-based trainers maintain the idea that not only are dogs born dominant or submissive, but also that they are naturally motivated to achieve a higher rank—especially if there is an ineffective leader (Millan & Peltier, 2006, p. 3, 27, 113, 139, 168, 230, 242, 247-248). The idea behind this is a misperception of evolutionary motivation:

> *Evolutionary selective pressures cannot select for relationships such as heavier than, taller than, smarter than, or more dominant than. Evolutionary selective pressures cannot operate on the relative contents of social contexts favoring one individual over another. Genes lie in the individual and not in the space between individuals. Genes influence the absolute and not the relative properties of attributes. Dominance, as a relationship between individuals, is not an absolute property of an individual, but an outcome influenced by multiple properties of individuals.*
>
> - Bernstein, 1981

The more we learn about social behavior in animals, the more we realize that social animals evolve away from conflict, not towards it. Prosocial behaviors like cooperation, fairness, reciprocity, empathy, trust, consolation, and altruism are a central driving force of evolution; not dominance (Pierce & Bekoff, 2012). It is—and has always been—a dangerous world, and species that are prosocial and cooperate for protection and food gathering are more successful. One of the most important factors in developing cooperation and reciprocity in a relationship is through a play atmosphere where animals learn the rights and wrongs (i.e. morals) of social interactions, motivated to keep play lasting longer by inhibiting their bites, playing nice, self-handicapping, etc. (Jensen, 2007).

Enlisting the Help of a Professional

It is absolutely imperative that if you have a dog with major behavioral issues that you seek a professional who is experienced with reading body language and understands the importance and science of positive methods. If you hire a person like Millan who cannot recognize the difference between threats and conciliation (or worse believes that the signals themselves have dominance characteristics) then you will be unable to gain the trust needed to build a better bond with your dog. Leadership is about communication, not dominance, and trust is the foundation of every sentient and gregarious being's social relationship. It is the foundation of what dictates our ability to communicate and to share a life of cooperation instead of confrontation. You cannot build trust by striking, kicking, and intimidating: only fear.

Dog Bites

These are not safe tools, and with Cesar hitting mainstream media, dog bites are on the rise both in the U.S and other countries. Hospital admissions due to dog bites have risen 59% in some areas (Newman *et al*., 2010) since his episodes began airing. Television is consistently listed as the source of information where an owner learned to attempt a technique that resulted in their dog becoming aggressive towards them or biting them (Herron *et al*., 2009).

It is undeniable that Millan has created a highly appealing explanation and philosophy for understanding dog behavior. Before I began studying applied animal behavior, I was Millan's biggest fan—read all of his books, watched his show, and could not understand why my uncle (a veterinarian) called him a quack. His pontifications are a call to arms, to step up, to be a *leader*. It is immensely empowering to listen to and read. He takes the romanticism behind the concept of the dog whisperer and tells the world that they can do it too; that as long as anyone steps up to be a leader, behavior problems disappear.

However, dogs do not read poetry, and Millan's dangerous and abusive methods ignore 80 years of research in animal behavior. The references below are from more than a half-century of PhD-level research in psychology, behavioral neuroscience, applied animal behavior, ethology, and zoology. Cesar Millan is "self-taught." The arithmetic is really pretty simple.

Recommended reading and viewing:

Marc Bekoff, *PhD, an evolutionary biologist and a pioneer in the field of animal behavior, emotions and cognition, has written excellent blogs on the subject of dominance and on Millan after he strangled a husky on national television*

James Ha, *PhD, CAAB, a certified applied animal behaviorist and one of the most intelligent men I've ever had the pleasure of meeting, wrote an excellent blog on Millan's dangerous methods and you can watch his interview on Komo4 news*

Ian Dunbar, *PhD, a veterinarian and animal behaviorist, talks about the "Mickey Mouse" version of dominance in traditional dog training*

Patricia McConnell, *PhD, CAAB, a certified applied animal behaviorist and a brilliant writer. Her book "The Other End of the Leash, Why We Do What We Do Around Dogs" (McConnell, 2002) is an absolute must read for gaining insight to human and canine body language as well as understanding dominance in both primates and canines. Be sure to check out her excellent blog as well.*

References *(alphabetical)*

Arhant, C., Bubna-Littitz, H., Bartels, A., Futschik, A., & Troxler, J. (2010). Behaviour of smaller and larger dogs: Effects of training methods, inconsistency of owner behaviour and level of engagement in activities with the dog. *Applied Animal Behaviour Science*, *123*(3-4), 131–142. doi:10.1016/j.applanim.2010.01.003

Beaver, B. V. (1983). Clinical classification of canine aggression. *Applied animal ethology*, *10*(1), 35–43.

Beaver, B. V. G. (2009). *Canine behavior : insights and answers*. St. Louis, Mo.: Saunders/Elsevier.

Bernstein, I.S. (1981). Dominance: The baby and the bathwater. *J Behav Brain Sci* 4:419-57.

Brown, J. L. (1975). *The evolution of behavior*. New York: Norton.

Choi, D., Kim, K.-H., & Jang, Y. (2011). Agonistic interactions between nymphs of Lycorma delicatula (Hemiptera: Fulgoridae). *Journal of Asia-Pacific Entomology*, *14*(1), 21–25. doi:10.1016/j.aspen.2010.11.010

Darwin, C. R. 1872. *The expression of the emotions in man and animals*. London: John Murray. 1st edition.

Fatjó, J., Feddersen-Petersen, D., Ruiz de la Torre, J. L., Amat, M., Mets, M., Braus, B., & Manteca, X. (2007). Ambivalent signals during agonistic interactions in a captive wolf pack. *Applied Animal Behaviour Science*, *105*(4), 274–283. doi:10.1016/j.applanim.2006.11.009

Ha, Jim. (2011) Behavioral Genetics. DVD, *TawzerDog*. Retrieved October 6, 2012, from http://www.tawzerdog.com/product/info/969/Behavioral-Genetics--Jim-Ha-.php

Houpt, K. A. (2006). Terminology Think Tank: Terminology of aggressive behavior. *Journal of Veterinary Behavior: Clinical Applications and Research*, *1*(1), 39–41. doi:10.1016/j.jveb.2006.04.006

Herron, M. E., Shofer, F. S., & Reisner, I. R. (2009). Survey of the use and outcome of confrontational and non-confrontational training methods in client-owned dogs showing undesired behaviors. *Applied Animal Behaviour Science*, *117*(1-2), 47–54. doi:10.1016/j.applanim.2008.12.011

Hiby, E. F., Rooney, N. J., & Bradshaw, J. W. S. (2004). Dog training methods: their use, effectiveness and interaction with behaviour and welfare. *Animal Welfare*, *13*(1), 63–70.

Hinde, R. A. (1978). Dominance and role—two concepts with dual meanings. *Journal of Social and Bio logical Structures*, *1*(1), 27–38.

Jensen, P. (2007). *The Behavioural Biology of Dogs:* (First.). CABI.

Lorenz, K. (1966). *On aggression*. New York: Harcourt, Brace & World.

McConnell, P. (2002). *The Other End of the Leash* (1st ed.). Ballantine Books.

McGreevy, P. D., Starling, M., Branson, N. J., Cobb, M. L., & Calnon, D. (2012). An overview of the dog–human dyad and ethograms within it. *Journal of Veterinary Behavior: Clinical Applications and Research*, *7*(2), 103–117. doi:10.1016/j.jveb.2011.06.001

Miklósi, Á. (2008). *Dog Behaviour, Evolution, and Cognition*. Oxford University Press.

Millan, C., & Peltier, M. J. (2006). *Cesar's Way*. New York: Three Rivers Press.

Millan, C., & Peltier, M. J. (2007). *Be the pack leader: use Cesar's way to transform your dog-- and your life*. New York: Harmony Books.

Newman J, Westgarth C, Pinchbeck G, Dawson S, Morgan K, & Christley R. (2010). Systematic review of human-directed dog aggression. *The Veterinary record*, *166*(13).

Nyhan, B., & Reifler, J. (2011). *Opening the Political Mind*. The effects of self-affirmation and graphical information on factual misperceptions. Retrieved from http://www.dartmouth.edu/~nyhan/opening-political-mind.pdf

Pierce, J., & Bekoff, M. (2012). Wild Justice Redux: What We Know About Social Justice in Animals and Why It Matters. *Social Justice Research*, *25*(2), 122–139. doi:10.1007/s11211-012-0154-y

Polis, G. A. (1981). The Evolution and Dynamics of Intraspecific Predation. *Annual Review of Ecology and Systematics*, *12*, 225–251.

Ramírez, J. M., & Andreu, J. M. (2006). Aggression, and some related psychological constructs (anger, hostility, and impulsivity) Some comments from a research project. *Neuroscience & Biobehavioral Reviews*, *30*(3), 276–291. doi:10.1016/j.neubiorev.2005.04.015

Reisner, I. R. (1994). Risk factors for behavior-related euthanasia among dominant-aggressive dogs: 110 cases (1989-1992). *Journal of the American Veterinary Medical Association*, *205*(6), 855–63.

Rooney, N. J., & Cowan, S. (2011). Training methods and owner–dog interactions: Links with dog behave iour and learning ability. *Applied Animal Behaviour Science*, *132*(3-4), 169–177. doi:10.1016/j.applanim.2011.03.007

Rosado, B., García-Belenguer, S., León, M., & Palacio, J. (2009). A comprehensive study of dog bites in Spain, 1995–2004. *The Veterinary Journal*, *179*(3), 383–391. doi:10.1016/j.tvjl.2008.02.002

Sacks, J. J., Kresnow, M., & Houston, B. (1996). Dog bites: how big a problem? *Injury Prevention*, *2*(1), 52–54.

Schaller, G. B., & Keane, R. (1972). *The Serengeti lion; a study of predator-prey relations*. Chicago: Uni versity of Chicago Press.

Schilder, M. B., & van der Borg, J. A. (2004). Training dogs with help of the shock collar: short and long term behavioural effects. *Applied Animal Behaviour Science*, *85*(3-4), 319–334. doi:10.1016/j.applanim.2003.10.004

Scott, J. P., & Fuller, J. L. (1965). *Genetics and the social behavior of the dog, by John Paul Scott and John L. Fuller*. Chicago: Univ. of Chicago Press.

Scott, J. P. (1966). Agonistic behavior of mice and rats: A review. *American Zoologist*, *6*(4), 683–701.

Seligman, M. E. P. (1972). Learned helplessness. *Annual review of medicine*, *23*(1), 407–412.

Sherman, C. K., Reisner, I. R., Taliaferro, L. A., & Houpt, K. A. (1996). Characteristics, treatment, and outcome of 99 cases of aggression between dogs. *Applied Animal Behaviour Science*, *47*(1), 91–108.

Stammerjohan, C., Wood, C. M., Chang, Y., & Thorson, E. (2005). An empirical investigation of the inter action between publicity, advertising, and previous brand attitudes and knowledge. *Journal of Advertising*, *34*(4), 55–67.

Tavassoli, N. T. (1998). Language in Multimedia: Interaction of Spoken and Written Information. *Journal of Consumer Research*, *25*(1), 26–37.

Tzetzis, G., Votsis, E., Kourtessis, T., & others. (2008). The effect of different corrective feedback methods

on the outcome and self confidence of young athletes. *Journal of Sports Science and Medicine*, *7*(3), 371–378.

Udell, M. A. R., Dorey, N. R., & Wynne, C. D. L. (2010). What did domestication do to dogs? A new ac count of dogs' sensitivity to human actions. *Biological Reviews*, *85*(2), 327–345. doi:10.1111/j.1469-185X.2009.00104.x

Weiss, J. M., & Glazer, H. I. (1975). Effects of Acute Exposure to Stressors on Subsequent Avoidance-Escape Behavior. *Psychosomatic Medicine*, *37*(6), 499–521.

Wilson, E. O. (2000). *Sociobiology: the new synthesis*. Belknap Press of Harvard University Press.

Wilsson, E. (1984). The social interaction between mother and offspring during weaning in german shep herd dogs: individual differences between mothers and their effects on offspring. *Applied Animal Behaviour Science*, *13*, 101–112.

Yin, S. (2011, November 17). Experts Say Dominance-Based Dog Training Techniques Made Popular by Television Shows Can Contribute to Dog Bites. *Huffington Post*. Retrieved from http://www.huffingtonpost.com/sophia-yin/experts-say-dominance-bas_b_204482.html

Hyperlinks

[1] http://swz.salary.com/SalaryWizard/Animal-Scientist-I-Salary-Details.aspx
[2] http://www.cesarsway.com/shop
[3] http://www.youtube.com/watch?v=9ihXq_WwiWM
[4] Kelley, L. C. (2012, February 8). Deconstructing the Concept of Dominance. *Psychology Today*. Retrieved October 2, 2012, from http://www.psychologytoday.com/blog/my-puppy-my-self/201202/deconstructing-the-concept-dominance