
Reactive Dogs and Exercise

Can modifying the
daily exercise regime
improve behaviour?

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Introduction

The importance of regular exercise for dogs is well known. The benefits to physiological and psychological well-being are widely documented by the veterinary world and organisations that support animal welfare (McConnell, 2006; DEFRA, 2006). Providing a dog with daily exercise can help maintain the heart and circulation, keep the dog at a healthy weight, develop good muscular structure, prevent urinary infections and ensure the dog is less susceptible to psychological conditions such as depression (Reusche, 2011; Stilwell, 2014a). As smell is the most important sense to the dog, mental maps that are conjured when the dog is allowed to sniff its environment are vibrant and beyond the scope of human imagination (Tenzin-Dolma, 2012). Walking should not merely be the act of providing physical movement; pausing for calm quiet sniffing expands the mental horizons of the dog and provides it with information of incidents that have occurred recently in that particular environment - a dogs 'daily newspaper'. An exercise regime that provides an appropriate combination of walking and sniffing time will result in a happy, well stimulated dog (Tenzin-Dolma, 2012). This advice is sound for a large majority of dogs but is it appropriate for dogs that are highly reactive or aroused on a daily walk? If a dog becomes highly aroused or stressed by the scent or movement of another dog, is the mere act of exposing such dogs to their reactivity triggers on a daily basis really providing these dogs with optimum health and well-being?

The focus of this study is to discuss the issues that arise for reactive dogs when out on a daily walk or during their daily exercise regime and to consider whether periods of rest and calm activity can be more beneficial to their health and well-being than constant exposure to their stressors. The majority of evidence available to date appears to be anecdotal. Therefore, the problems of finding scientific literature in this area will also be considered in this essay.

Literature review

Dogs, like humans, experience a wide range of emotions. Charles Darwin was the first to describe a set of basic emotions (e.g. happy, sad, fear, disgust, anger, surprise) in humans and other animals, and dogs experience this same range of emotions (Bekoff, 2000; Berns, 2013). Emotions as survival mechanisms form a fundamental part of the biological systems of behaviour which have been refined by evolution like any other biological system (Bradshaw, 2011). Bradshaw's model, '*The Three Components of Emotion*', provides a mechanism for measuring the underlying physiology (e.g. an increase in the stress hormone adrenaline) and relating it to a corresponding behaviour (e.g. running away or fighting). Whilst observing a dogs' behaviour and physiological state can give us clues as to how the dog is feeling, we have no clear idea how its hormone activity is affecting its brain and homeostatic balance, as rises in adrenaline and cortisol occur when the dog is feeling both uncomfortable and happy and excited (Belpedio *et al.*, 2010; Bradshaw, 2011; Carrier *et al.*, 2013). Emotional arousal can interfere with the more rational parts of the brain. As more neural connections run from the amygdala (the limbic system) to the cortex rather than vice versa, it is easier for emotions to influence the decisions that are made. One simple trauma can have long lasting effects and the ability to change the performance of the amygdala (McConnell, 2006). Behaviours such as lunging, barking, snarling and biting are primarily influenced by emotions of fear, anger and frustration. Individual dogs can vary greatly in terms of how intensely they feel emotions and consequently what external events will trigger hyper-reactivity and an irrational behavioural response (McConnell, 2006).

If emotional arousal involving adrenaline and cortisol are driving reactive behaviour, then the role of stress in reactivity cannot be underestimated. Stress is a psychological and physiological response to events that alters homeostatic balance; it can be either endogenous or exogenous. 'Eustress' or positive stress enables enhanced performance, but 'distress', where the organism is not coping, will over time result in pathological alteration to the organism (Muir, 2012, Reusche, 2012; Rugaas, 2005; Scholz and Von Reinhardt, 2006). The sympathetic and parasympathetic nervous systems strive to work together to regain homeostatic balance within the body following exposure to a stress trigger (Coleville & Bassert, 2008). Table 1 describes the role of each system in controlling stress in the body.

Table 1 Role of the Sympathetic and Parasympathetic nervous system in a stress response (Colville and Bassert, 2008).

Sympathetic nervous system	Parasympathetic nervous system
<ul style="list-style-type: none"> • Nerve endings release the excitatory neurotransmitters adrenaline (epinephrine) and noradrenalin (norepinephrine). • Quickens heart and breathing rate. • Increases blood glucose levels. • Dilation of blood vessels to muscles particularly digestive and excretory systems. • Fight or flight response is triggered. • Chronic exposure to this type of stimulus could ultimately affect the health of the dog and generate symptoms such as gastrointestinal difficulties, anxiety and muscle tension. 	<ul style="list-style-type: none"> • Nerve endings release the inhibitory neurotransmitter acetylcholine, which has the opposite effect to adrenaline and noradrenalin. • Slows heart rate and breathing. • Constricts eye muscles. • Constricts bronchioles in the lungs, thus slowing breathing. • Stimulates glandular secretions • An energy conservation response allowing the body to restore after an emergency – an overall relaxation response. • Dominant under non-stressful conditions.

Cortisol and adrenaline work as part of a negative feedback system to keep the body in homeostatic balance. Distress can alter the normal functioning of the feedback control especially if the body is not allowed a long recovery phase after the first exposure to distress and exhaustion. The resulting development of ‘adaptation diseases’ such as kidney and cardiovascular disease can be expected (Scholz and Von Reinhardt, 2006). Figure 1 below outlines the processes involved in the stress induced negative feedback mechanism.

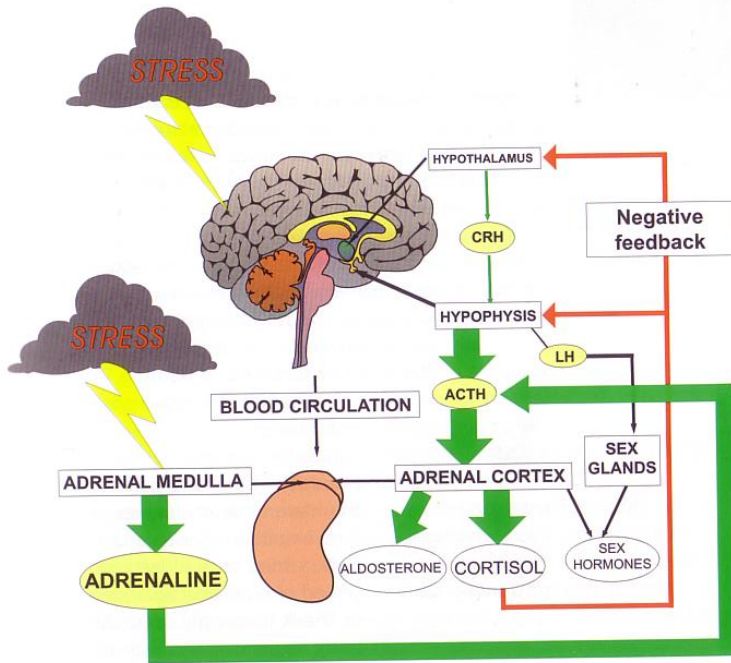


Figure1: The effects of stress on the feedback control system (Scholz and Von Reinhardt, 2006)

Tests on stressed animals have revealed that whilst the first release of adrenaline into the blood stream may dissipate within 15 minutes, the glucocorticoids that follow can take from two to six days to return to a baseline level. If the negative feedback mechanism stops working, cortisol levels within the body can be up to four times higher than normal within a few days, failing to return to baseline levels if exposure to the trigger is persistent (Reusche, 2012; Scholz and Von Reinhardt, 2006). Figure 2 shows how the hormone levels of constantly stressed dogs never return to baseline levels because of persistent exposure to their stress triggers (Figure 2).

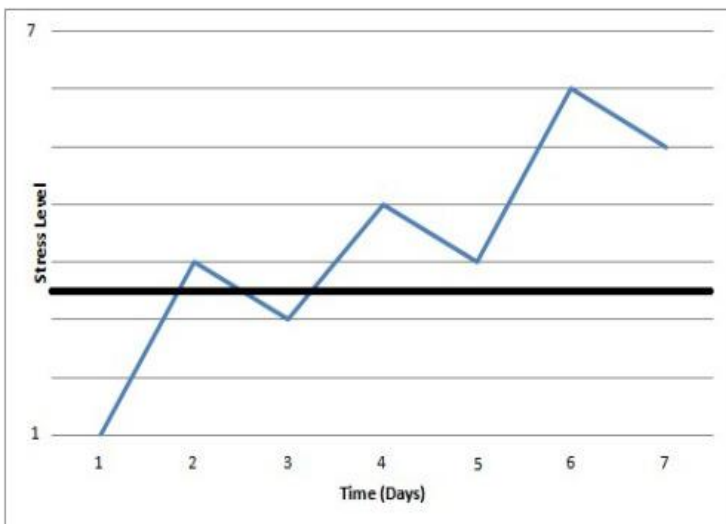


Figure 2: Hormone levels during exposure to constant stress

(Source: paws4udogs.wordpress.com)

It can be concluded that reactive dogs are living for most of the time in a state of distress. Their bodies are reacting without thinking; their ability to learn severely disabled or non-existent. The increased level of arousal that forms part of their stress response increases the likelihood of aggression. To reduce distress, all triggers that may cause a dog to react need to be removed (Muir, 2012; Reusche, 2012).

Careful observations of canine body language have identified a number of indicators that show levels of excessive or unhealthy stress and suggest that hyper-energetic dogs are actually just stressed rather than exercise deficient (Rugaas, 2005; Aloff, 2005). It has been suggested that certain activities, such as constant ball or Frisbee chasing for more than 30 minutes, can cause over arousal for several days if the dog is not allowed a recovery period. Over arousal causes stress; a stressed dog will eventually reach their threshold point much earlier and resort to reactivity (Fishburn, 2014; Frediani, 2000; Kimo, 2011; Rugaas 2005).

A growing number of behaviourists and trainers whilst acknowledging physical exercise is healthy for our dogs support the theory that a daily exercise regime that is strictly for physical exercise is meaningless and of little benefit to the dog's psychological well-being (Fishburn, 2014; Fisher, 2014; McDevitt, 2007; Reusche, 2012; Rugaas 2005; Scholz and Von Reinhardt, 2006; Steinker, 2012; Tenzin-Dolma, 2012). If a walk does not allow the dog to be relaxed and take in all the sights and smells of the environment, then perhaps other methods of mental stimulation should be considered (Appendix 1). Fishburn (2014) firmly believes that over exercise cannot only lead to heightened stress and reactivity but also to communication problems between dogs (see Appendix 2). Being constantly exposed on a daily basis to arousal triggers keeps the dog in a constant state of distress (Muir, 2012; Reusche, 2012; Scholz and Von Reinhardt, 2006). It has been suggested that a dog locked into a spiral of destructive stress by constant exposure to stress inducing triggers may need four to six weeks of trigger avoidance to allow homeostatic balance to be restored (McDevitt, 2007; Reusche, 2012; Steinker, 2012).

The effects of cortisol and adrenaline on the body are well known but the physiological changes that occur are invisible and not well studied by scientists.

Lack of scientific evidence

Bekoff (2000) outlines the best way to study animal emotions is to spend time observing them using comparative and evolutionary ethological, neurobiological and endocrinological research. The observations and views of behaviourists and trainers outlined in this essay have not undergone scientific scrutiny but are based on years of experience in their individual fields. This raises the question as to why there has been little detailed scientific studies into the link between raised cortisol levels and reactive dogs during daily walking or when over stimulated by exercise?

Sampling of salivary cortisol levels to determine levels of stress has been used in several studies (Beedra *et al.*, 1998; Belpedio *et al.*, 2010; Carrier *et al.*, 2013; Hekman *et al.*, 2014a, b; Igyarto, 2009), with the majority taking place in closed environments to allow for the control of variables. Blood plasma levels of cortisone are considered the 'gold standard', but like urines, faeces and hair samples are difficult to obtain at the optimum time especially when working in an outdoor environment (Hekman, 2014). For research purposes salivary samples are taken from the dog before the stressor and approximately twenty minutes after the stressor to determine the increase in cortisol levels. This method of testing is suitable for acute stress responses as cortisol appears to rise for approximately one hour after the stressor, then fall for approximately one hour after exposure. In dogs, acute stress is accompanied by increased activity of the sympathetic–adrenal–medullary (SAM) system and the hypothalamic–pituitary–adrenal (HPA) axis. The SAM axis mediates the well-known 'fight or flight' response, an initial, rapid reaction to an immediate stressor. A slower response to a stressor, with effects in minutes to hours or even days, is mediated by activation of the HPA axis, leading to the release of glucocorticoids (GCs) from the adrenal cortex. The immune system also responds to stressors either by increasing or decreasing production of cells for fighting infections. The three systems operate at different rates – the sympathetic system reacts in seconds, the HPA in minutes and the immune system in hours or days. It is thought that chronic stress may lead to an increased central stimulation of the HPA axis, resulting in increased cortisol, the primary glucocorticoid in dogs.

All of the studies using an indoor environment when sampling saliva to examine an increase in cortisol levels after stressful events, concluded that there is a positive correlation between exposure to stress and increase in salivary cortisol with one study suggesting that bitches are more susceptible to acute and chronic stress than dogs (Beedra *et al.*, 1998; Belpedio *et al.*, 2010; Hekman *et al.*, 2012; Hekman *et al.*, 2014a, b). The two studies testing salivary cortisol increases in an outdoor environment (Carrier *et al.*, 2013; Igyarto, 2009) also concluded that cortisol levels increased when dogs were physically and emotionally aroused. Igyarto (2009) was able to demonstrate that the cohort of dogs sampled who displayed the most acute behavioural signs to the stress stimulus (e.g. paw lifting, lip licking) also had the most inflated cortisol levels. The conclusion from this study, suggesting that the cohort of dogs were incapable of choosing an appropriate coping mechanism when exposed to higher stress levels, may have a significant bearing on the experiences of reactive dogs when exposed to triggers during their daily walks.

The problems that arise with sampling cortisol levels in dogs and the lack of a stress measuring tool (Heckman, 2010) are possible reasons for the limited range of research to date into the effects of exposing reactive dogs to stress triggers on a daily basis. Whilst sampling of saliva is effective for measuring short term stress, the use of urinary cortisol levels (cortisol-creatinine ratio) is the favoured method for analysis of the effects of longer term stress. Both methods pose challenges in terms of collection in an outdoor environment. In addition, exposing the dog to sampling procedures prior to the interaction with its 'stressor' is likely to cause raised salivary cortisol and therefore provide false baseline data. So despite its common use, it has been concluded that analysis of cortisol levels alone is not a highly reliable indicator of stress levels (Heckman, 2010; Hekman *et al.*, 2014b).

As scientific evidence concludes there is a positive correlation between stress and increased cortisol levels in dogs, it would suggest that dogs who are predisposed to coping with triggers on a daily walk by exhibiting reactive behaviour also experience raised cortisol levels. The absence of accurate sampling techniques in this environmental context means relying on observational data to draw conclusions is essential. Few specific observational studies have been undertaken to determine

whether reducing exposure to reactivity inducing triggers on a daily basis correlates to an overall improvement in the dog's behaviour allowing them to learn more effectively. This small scale study aims to investigate whether modifying daily exercise as part of a relaxation programme that also includes an increase in mental stimulation and enrichment is effective at reducing stress levels and subsequent reactive displays by dog reactive dogs.

Small Scale Research Study

Method

A small scale observational research study was carried out with a cohort of ten randomly selected dogs who were attending a small group workshop for reactive dogs. All dogs displayed varying levels of stress signals and reactive body language when exposed to other dogs both on and off the lead. Behaviours observed in the cohort when exposed to the stimulation trigger of another dog approaching included; barking (or other vocalisation), lunging, pulling, whining, high tail carriage, trembling, excessive salivation and hyperventilation. Before attending the practical workshops, each dog had undergone several individual sessions of counter-conditioning; success rates amongst the cohort were variable. In addition, owners attended a workshop without their dogs to prepare them for the practical skills sessions. This workshop included instruction in canine body language; identifying calming signals and early warning signs that meant intervention was needed to prevent a full blown reactive outburst, everyday management skills, including Tellington TTouch techniques to help relaxation and restore balance within the dog, and suggested activities to provide mental stimulation and enrichment (Appendix 3).

Owners were requested to implement the relaxation protocol with their dogs for three to six days immediately before attending the practical workshop and where possible to eliminate or substantially reduce the amount of exercise their dog received. All forms of chase and highly stimulating physical activities were to be eliminated completely for the duration of the programme and replaced with activities to provide mental

stimulation and enrichment. Following completion of the practical workshops a questionnaire was provided for completion (Appendix 4) requesting owners evaluate their dogs' body language and reactivity levels before, during and after undertaking the relaxation protocol.

Results and Discussion

The owners completing the relaxation programme were asked to considerably change their attitude to the daily exercise they provided for their dog. Prior to the programme the owners firmly believed that their dogs needed a large amount of physical exercise to tire them out as they were 'energetic' dogs. All owners stated that the daily walk was stressful for them and not enjoyable; they were continually scanning the environment for other dogs and experiencing feelings of dread and panic if another dog appeared on the horizon. Advising them to eliminate or substantially reduce exercise for their dog was met with mixed emotions.

Table 2: Initial thoughts and feeling to the relaxation protocol

Table 2 shows a summary of the responses to question two of the questionnaire asking owners to state their initial thoughts and feelings about modifying their dogs' daily exercise regime. Four owners thought the programme was a good idea but six had concerns that their dogs' behaviour would become worse if they stopped exercising their dog even for one day.

Feelings/thoughts	Number of owners
Good idea	4
Uncertain	2
Sceptical	1
Worried	2
Horrified	1
Total	10

These responses were not unexpected as the belief that daily exercise is vitally important to satisfy the physical needs of the dog is widely held and well documented with little being known about the adverse effects exercise can cause on the

psychological well-being of the dog reactive dog. Despite concerns being expressed all owners agreed to implement the programme for between three and six days recording how much exercise they gave their dog during this programme. Figures 3 and 4 below show the number of days owners were able to implement the programme and the amount of time spent exercising their dog.

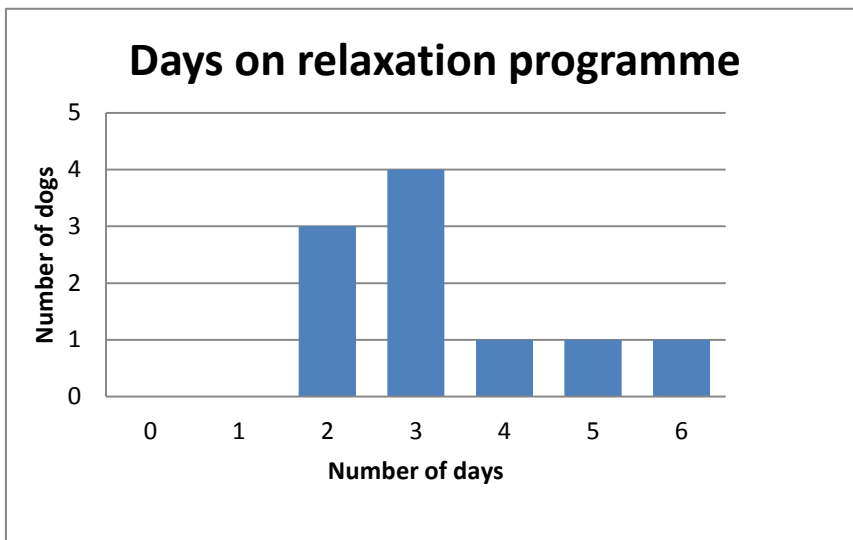


Figure 3: Chart to show the number of days the relaxation programme was implemented for each dog.

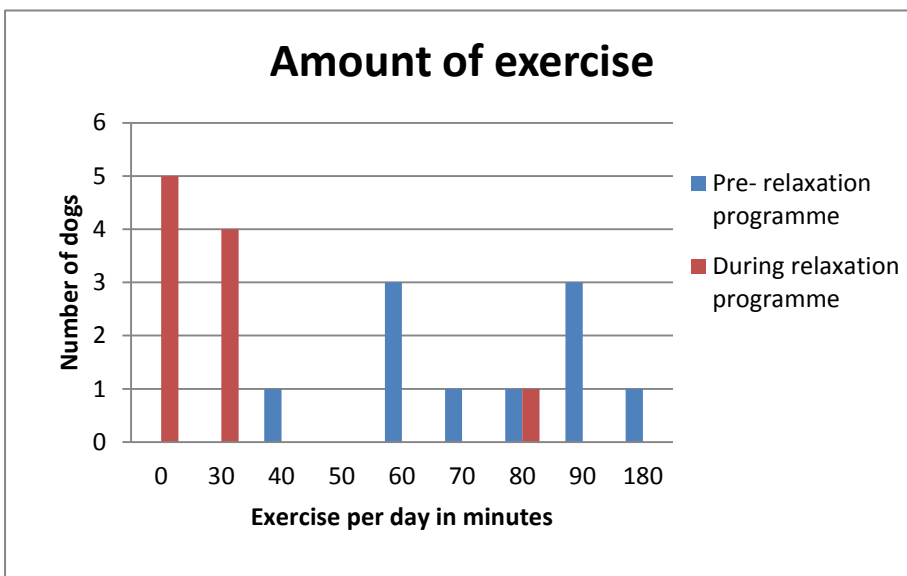


Figure 4: chart to show the amount of exercise each dog received before and during the relaxation programme.

The results from the questionnaire show that three days was the length of time most owners chose to implement the relaxation programme, with only three owners continuing for longer; only one owner implemented the programme for the full six

days. This result was better than anticipated based on the feelings expressed by the owners when initially presented with the programme requirements. Apart from one owner, who continued with the same amount of exercise (80 minutes each day divided into two walks) but changed the type and location, all owners reduced their dogs' exercise considerably, with five owners completely eliminating exercise for the duration of the programme. This result was completely unexpected and may be one contributing factor influencing the changes in body language observed by the owners.

Recording observations of the body language exhibited by the dogs when exposed to their trigger stimulus during daily walks was completed before and after implementation of the relaxation programme. Figure 5 shows the types of body language observed in the cohort dogs.

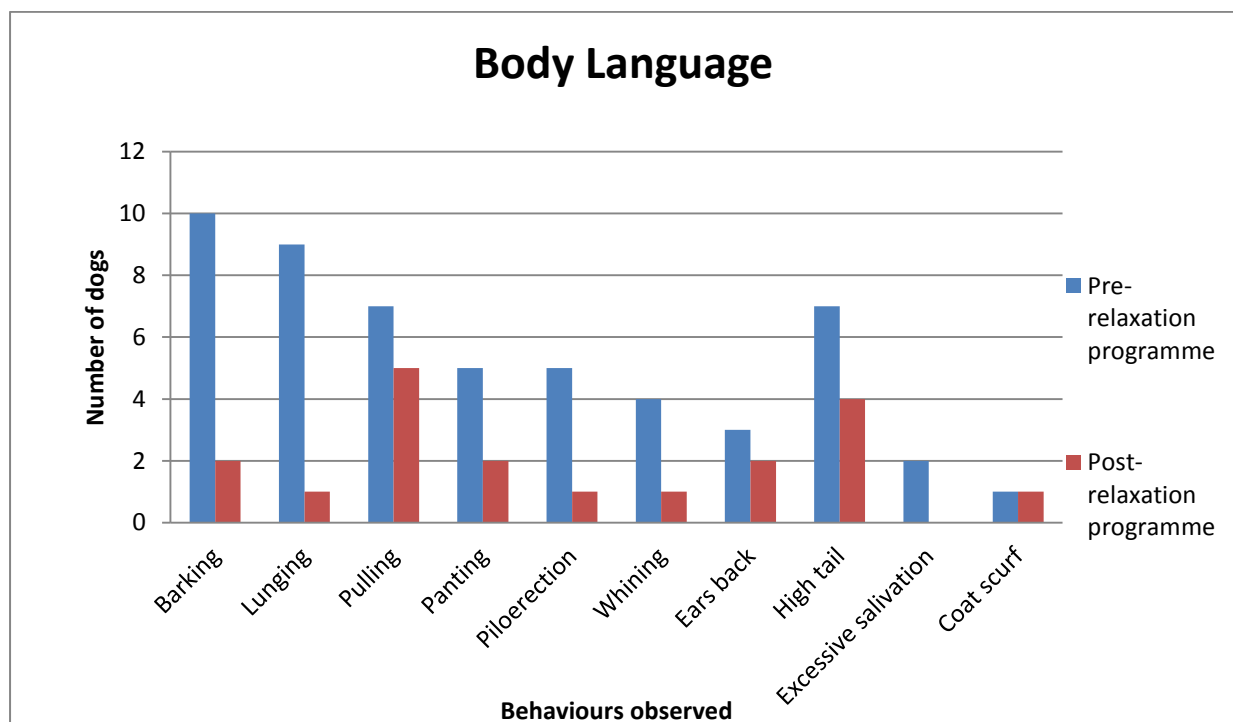


Figure 5: Chart to show canine body language observed before and after the relaxation programme.

The observations show variable changes in the body language of the whole cohort (except for coat scurf) following completion of the relaxation programme. An 80% reduction in barking and piloerection and an 88% reduction in lunging were recorded. Barking and lunging are the two behaviours that owners found most difficult to manage and where the most improved as a result of the changes to the exercise regime.

Pulling on the lead showed the least change with only 28% of the cohort showing an improvement in this behaviour. However, as no data was obtained on the ability of the cohort to walk on a loose lead prior to completing the relaxation programme, it is difficult to draw conclusions as to the effects of a change in exercise regime on pulling on the lead.

The dog who received no change to their daily exercise regime did receive Tellington TTouch and enrichment activities. Even though this dog was observed as having a calmer demeanour, it showed no changes in the body language it exhibited when confronted with the trigger stimulus. Introducing Tellington TTouch techniques and activities that provided mental stimulation and enrichment are also likely to have influenced the changes in the body language observed. However, the short time-span between instruction of the TTouch and implementation of the programme would suggest that its influence on the results obtained above is likely to be minimal.

Engaging dogs in activities that involve using their olfactory and problem solving abilities are known to promote calm behaviour (Mackinnon, 2014; Stilwell, 2014 a,b), so it is feasible that these activities have influenced the study results and therefore would need to be controlled more stringently in any future research. In addition no evidence was collected on the type of activities the dogs took part in during their time on the programme; again this would be a necessary requirement in any future studies of this kind.

Despite the effects of other elements included in the relaxation programme not being measured, it can be concluded from the observational data that was obtained that a change in the daily exercise regime is associated with a reduction in displays of reactive behaviour.

In addition to recording observations of canine body language, owners were asked to comment on the demeanour of their dogs. Figure 6 shows how owners perceived their dogs' demeanour during and immediately following the relaxation programme.

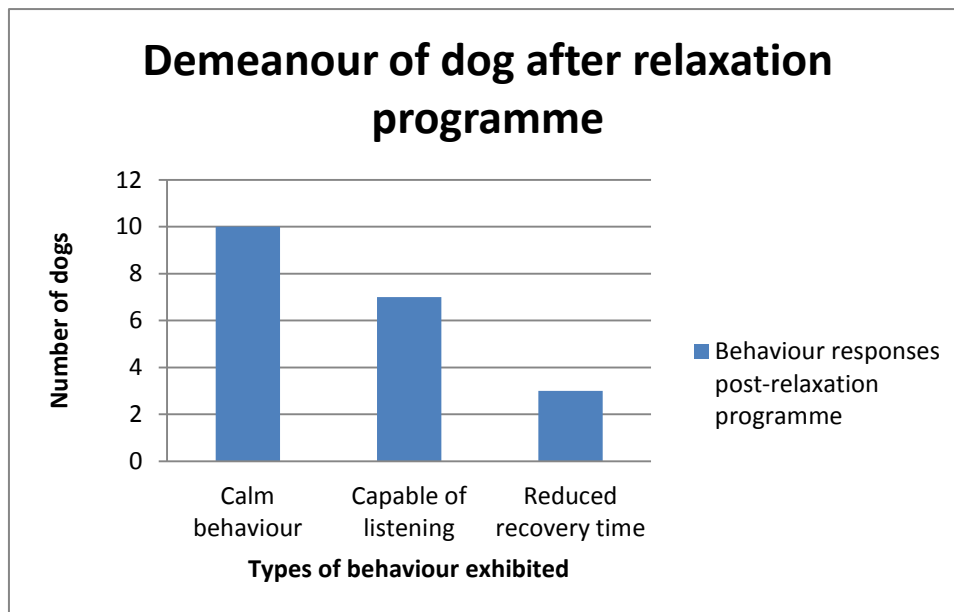


Figure 6: Chart to show the demeanour of each dog during and after the relaxation programme.

All the cohort dogs were reported as displaying a calmer demeanour; the dogs appeared more relaxed in the home environment and more aware and attentive of their owner. Seven of the cohort dogs completing the relaxation programme for three or more days demonstrated improved listening skills. In addition, the three dogs completing the programme for four to six days showed a significant reduction in recovery time following a reactive outburst. Cohort dogs that completed the programme for only two days did show signs of calm behaviour, but there were no recorded changes in their ability to listen or recover quickly from a reactive outburst. These results show a positive association between the amount of time the dog completed on the programme and the dogs' ability to listen and recover from a reactive outburst. This suggests that the longer the dog is exposed to a regime promoting relaxation and modified exercise, the more likely they are to be able to cope effectively with the approach of another dog. It would appear from the data collected that three days is the minimum time a dog should participate in the programme, however the most improvement was observed in the dogs that completed the programme for four days or longer. These observations agree with McDevitt (2007), who suggests a period of four weeks is the minimum time needed to show significant improvement in behaviour for these dogs, and Fisher (Appendix 1) who noted a significant reduction in the reactivity level and an improved ability to think in a dog who avoided walking for one month.

The findings of this study also support observations and deductions made by others that exercise can be a cause of stress symptoms in the dog, encouraging hypervigilant behaviour and an inability to cope with its surroundings (Fishburn 2014, Appendix 2); Fisher, 2014, Appendix 1; McDevitt, 2007; Reusche, 2012; Rugaas, 2005; Steinker, 2012; Tenzin-Dolma, 2012) Providing a calm daily regime where exercise is useful with opportunities for the dog to use its powerful olfactory ability, in combination with appropriate mental stimulation and enrichment, appears to change the behaviour and body language exhibited by dog reactive dogs. The results of the study suggest that the longer a dog is exposed to a programme of relaxation, coupled with low levels of appropriate exercise, the more likely a positive change in behaviour will be noted and the dog able to listen and learn.

Conclusions

Sampling and analysis of salivary or urinary cortisol levels are currently the most accepted method of determining levels of stress in dogs, but the lack of accurate sampling techniques means great reliance is placed on observational data to determine how stress is impacting on a dogs' behaviour. This small scale study set out to investigate whether modifying daily exercise as part of a relaxation programme, that also included an increase in mental stimulation and enrichment, was effective at reducing stress levels and subsequent reactive displays in dog reactive dogs. Observations of canine body language were collected prior to commencement of the programme and after the programme had been implemented for a period between two and six days. Analysis of the data indicated that all the cohort dogs displayed improved behaviour after following the relaxation programme, with dogs taking part for more than three days receiving the most benefit. In addition to showing a reduction in reactive body language displays, these dogs also demonstrated an improved ability to listen to the owner and a decreased recovery time following a reactive outburst. These findings support the theories surrounding exercise and stress levels put forward by behaviourists and trainers with years of experience in their respective fields. Whilst the results of this small scale observational study conclude that reducing or eliminating daily walking, combined with mental stimulation, enrichment and relaxation, results in decreased reactive displays and increased thinking ability in dog reactive dogs, supporting scientific evidence of changing cortisol levels is necessary to conclusively prove the hypothesis.

References:

Aloff, B. 2005, *Canine Body Language: A Photographic Guide*, Dogwise Publishing, pp-16-102.

Beedra, B, Schilder, MBH, Van Hoof, J, De Vries, HW. (1998). *Manifestations of chronic and acute stress in dogs*, [Online], www.2.univet.hu (Accessed 15.2.15)

Bekoff, M 2000, *Animal Emotions: Exploring Passionate Natures*, <http://bioscience.oxfordjournals.org/content/50/10/861.full> (Accessed 12.2.15).

Belpedio, C, Buffington, L Clusman, S Prete, F Sadler, A, Whittemore, L and Mungre, S 2010, *Effect of Multidog Play Groups on Cortisol Levels and Behaviour of Dogs*, [Online], <http://t.associationofanimalbehaviorprofessionals.com/jacobvol4no1.pdf#page=15> (Accessed 25.2.15).

Berns, G. 2013, *How Dogs Love Us: A neuroscientist and His adopted Dog Decode the Canine Brain*, Lake Union Publishing, USA

Bradshaw, J. 2011, *In Defence of Dogs*, Penguin Books, London, pp-152-179

Carrier, L O. Cyr, A. Anderson, R E. and Walsh, C J. (2013), *Exploring the dog park: relationships between social behaviours, personality and cortisol in companion dogs*, http://dogbody.psych.mun.ca/cru/CRU_Summer_2014/Publications_files/Ottenheimer%20Carrier_APPLAN3732.pdf (Accessed 23.2.15)

Colville, T and Bassert, J M, 2008, *Clinical Anatomy and Physiology for veterinary Technicians*, Mosby Inc., Canada

DEFRA, 2006, *Code of practice for the welfare of dogs*, [Online], https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69390/pb13333-cop-dogs-091204.pdf (Accessed 15.2.15)

Fishburn, I. 2014, *Yes, I have a reactive dog. No it is not my fault!* [Online], <http://thewolfdogblog.com/2014/11/26/yes-i-have-a-reactive-dog-no-it-is-not-my-fault> (Accessed 9.2.15).

Fisher, S. (2014) (pdf): *Accountability*, www.ttouchadmin.org.uk (Accessed 8.2.15)

Fredaini, J. 2000. *Trying to ease your Dogs Stress* [Online], http://www.whole-dog-journal.com/issues/3_1/features/Easing-Your-Dogs-Stress_5031-1.html (Accessed 9.2.15).

Heckman, J P 2010, *Why cortisol sucks as a measurement of stress*, [Online], <http://dogzombie.blogspot.co.uk/2010/01/why-cortisol-sucks-as-measurement-of.html>

Hekman, J. Karas, A. and Dreschel, N A. 2012, *Salivary cortisol concentrations and behaviours in a population of healthy dogs hospitalized for elective procedures*, [Online], <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3817620> (Accessed 15.2.15).

Hekman, J. Karas, A. and Sharp, C, 2014a, *Psychogenic Stress in Hospitalized Dogs: Cross Species Comparisons, Implications for Health Care, and the Challenges of Evaluation*, [Online], <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4128501> (Accessed 15.2.15).

Heckman, J P 2014b, *Designing stress studies, part 1: what do you sample?* [Online], <http://dogzombie.blogspot.co.uk/2014/01/designing-stress-studies-part-1-what-do.html>

Igyarto, Z H, 2009, *Behavioural and physiological characterization of context dependent aggressive behaviour in dogs*, [Online], http://teo.elte.hu/minosites/tezis2009_angol/zs_igyarto_horvath.pdf (Accessed 25.2.15).

Kimo, 2011, *Turid Rugass on Exercise*, [Online], <http://kimodog.blogspot.co.uk/2011/02/turid-rugaas-on-exercise.html> (Accessed 9.2.15).

McConnell, PB. 2006, *For the Love of a Dog*, Ballantine Books, New York, pp- xxviii, 139-141, 196

McDevitt, L. 2007, *Control Unleashed*, Clean Run Productions, USA pp- 31-68

Mackinnon, P. 20014, *Scentwork*, [Online], http://talkingdogsscentwork.co.uk/Talking_Dogs_Scentwork/Welcome.html (Accessed 18.2.15).

Muir, M. 2012, *Stress in Dogs: Recognising the causes and how to deal with them*, [Online], [www.action4dogs.co.uk/stress in dogs.html](http://www.action4dogs.co.uk/stress-in-dogs.html) (Accessed 10.2.15).

Reusche, S. 2012. *Chronic Stress in Dogs*, [Online], <https://paws4udogs.wordpress.com/2012/01/06/chronic-stress-in-dogs> (Accessed 19.2.15).

Reusche, S. 2011. *Exercising your dog*, [Online], paws4udogs.wordpress.com/2011/12/30/exercise (Accessed 19.2.15).

Reusche, S. 2012. *The Cortisol Vacation*, [Online], <https://paws4udogs.wordpress.com/2012/01/06/the-cortisol-vacation> (Accessed 19.2.15).

Reusche, S. 2012. *Too Much of a Good Thing: Overexcitement in exercise*, [Online], <https://paws4udogs.wordpress.com/2012/01/06/too-much-of-a-good-thing> (Accessed 9.2.15).

Rugaas, T. 2005, *On Talking Terms with Dogs: Calming Signals*, Qanuk, England, pp-57

Scholz, M and Von Reinhardt, C. 2007 *Stress in dogs* Dogwise Publishing, Washington, USA

Steinker, A. 2012(pdf): *Functional Application of using The Control Unleashed programme to Effect behaviour Change*, [Online], <http://www.petprofessionalguild.com/Resources/Documents/Barks%20From%20The%20Guild%20March%202012.pdf> (Accessed 10.2.15).

Stilwell, V. (2014a), *Exercise*, [Online], <https://positively.com/dog-wellness/exercise> (Accessed 9.2.15).

Stilwell, V.(2014b), *Dog Enrichment*, [Online], <https://positively.com/dog-wellness/dog-enrichment>(Accessed 18.2.15).

Stilwell, V.(2014c), *Scent work*, [Online], <https://positively.com/dog-behavior/tricks-sports/dog-sports/scent-work>(Accessed 18.2.15).

Tenzin-Dolma, L. 2012, *The Heartbeat at Your Feet*, Need2Know Books, Plymouth, pp-8, 23, 68

Appendices

Appendix 1

Quote from Sarah Fisher, Tellington TTouch Instructor and Behaviour Counsellor, regarding daily exercise, obtained via e-mail February 2015

I am seeing a client at the moment, a Great Dane; he has poor posture, couldn't eat when out, reactive, pulled owner over etc. I saw them before Christmas, the owner was on the point of giving up and in tears; they have a great trainer who came with them. We changed a few things and one of them was not to walk the dog but to practice quiet things and TTouch at home. They came to the farm on Wednesday and she told me she hadn't walked him for a month. The change in the dog was outstanding, just outstanding. He could take treats for the entire walk around the farm, barely pulled, was on a long line and free from the head collar for the first time in months, could sit at gateways, and so on. I could touch him all over which I couldn't do on the first visit. He was an absolute super star. When he saw a dog on the foot path he barked, but after a few seconds stopped and turned away from the dog to continue his walk. I couldn't believe the difference in him. Yes, the owner has learned a little touch but the last month has been terrible for her so the main difference was not walking him for a month. He is a totally different dog that can now learn.

Appendix 2

Quote from Dr Isla Fishburn regarding exercise and communication obtained via e-mail February 2015

Generally, I am not a big fan of dogs having off lead exercise every day and am convinced that this can cause communication issues between dogs, particularly reactive dogs, but dogs in general - there is so much to dogs than people recognise and even though a dog that is running off lead and is controlled by its human guardian it can create heightened states of reactivity in another dog. I find the subject fascinating and am certain there is a link, even if there is no scientific evidence for this. From my observations of watching dogs at agility, having a reactive dog and working with reactive dogs, knowing about fear and trauma behaviour, I know that over-exercise or simply allowing exercise to be all/mostly off lead does pose as a communication problem.

Appendix 3

Doggy Holiday relaxation protocol introduced during the skills workshop

If your dog is constantly repeating over the top behaviours e.g. barking, lunging, chasing (including ball play), it is highly likely they are living in a state of permanent arousal. As with humans that are continually stressed, your dog will find everyday life increasingly difficult to cope with. Constantly being highly aroused provides your dog's brain with a chemical bath of hormones such as adrenaline, cortisol, noradrenaline, and neo-epinephrine. These are the hormones that prepare your dog for 'fight or flight'. To have a well-balanced calm dog you need to create an environment that allows production of oxytocin and serotonin, the two hormones that turn off these fight and flight hormones and calm the fear and arousal centres in the brain.

If your dog is in a permanent state of arousal it is highly unlikely that they are able to relax fully. Research has shown that dogs need to relax and sleep deeply to allow their brains to be in a state of balance, so that they can become a 'thinking dog' as opposed to a 'reactive dog'. Following each episode of 'an adrenaline rush' it can take *up to 6* days for these hormones to recede to a neutral state. Using the techniques outlined in this sheet will allow you to help your dog to become relaxed and neutralise the cortisol hormones circulating within his/her body. It is not until the cortisol hormone levels return to normal within the body that your dog can begin to learn and process positive information, and retain this new learning for future use.

By giving your dog a "doggy holiday" for a minimum of 3 days prior to starting the next level of training, allows the cortisol hormones within your dog to reduce. You may find some of the suggestions contained in this sheet difficult to do, but you should consider the needs of your dog. If you want your dog to be successful in its rehabilitation programme then it is important that you provide an environment that allows your dog to reduce the adrenaline fuelling the body and promote production of calming hormones that allow thinking and learning to take place. You will know when your dog

is fully relaxed because he/she will become soft and heavy. They should also display signs such as: soft blinking eyes/slitty eyes, deep sighs, slowed breathing rate and involvement in activities **WITHOUT** a reactive episode.

Doggy holiday for 3 (min) - 6 days prior to next level of training:

- Use TTouch with your dog every day. Settle your dog in a quiet environment when you have time to give quality touch work to them. Play relaxing music so that you can both benefit from the relaxing atmosphere. Remember to breathe whilst performing the touch. If your dog pulls away check you are not holding your breath, performing the touches too quickly or performing the touches too deeply.
- Take away **all** forms of rushing play (ball play, chasing, and play with other dogs).
- **Reduce exercise – or avoid exercise.** Keep walks very short, 15-20 mins, and keep them on the lead. Take your dog out at a time when you are least likely to encounter other dogs or take them in the car to a quiet place away from the home. If you do not think that you can walk your dog without meeting another dog, **do not walk them - it is only for 3 -6 days – do some work with them at home instead (see below).**
- Replace a daily walk with some TTouch groundwork exercises. You do not need special equipment for this; you can use plant pots, broom handles and similar pieces of garden equipment. If you do not have equipment just walk patterns with your dog e.g. figure 8, letter M shape, zigzag etc.
- When giving your dog a short walk watch their body language carefully for signs of arousal. If your dog shows any indicator it is becoming aroused abandon the walk and return home. It is better to shorten the walk than to elevate the cortisol hormone levels again, as this will result in you having to start the doggy holiday again from the beginning.
- Take your dog to new places and encourage them to sniff around on lead. Encourage them to use their nose and their senses of smell, touch, taste. It is far more mentally stimulating than running around after a ball. **Limit time to 15mins.**

- Introduce calm training and nose work. Getting your dog to find small pieces of cheese hidden around the house will work the brain far more effectively than running around aimlessly on an off lead walk.
- Clicker training and mental stimulation with mind games will tire your dog. **It is a vital part of the doggy holiday that your dog receives mental stimulation. You should replace physical exercise with mental stimulation for the holiday to be successful.**
- Reduce noise; make sure your dog has a quiet place to retreat to in the home.
- Be consistent, calm and clear with your dog.
- If you do encounter a situation that heightens your dog's arousal, stand between your dog and the source of concern. This lets you take control of the situation until you can remove your dog back to a safe place as quickly as possible.
- ***Above all, enjoy this relaxing time with your dog and view it as the foundation to a new bond you are building between you.***

Appendix 4

Post Doggy Holiday relaxation protocol Questionnaire

Prior to attending the practical Reactive Dog Workshops you were asked to put your dog on a 'Doggy Holiday'. The purpose of this is to ensure that your dog is exposed to the minimal amount of triggers that cause stress/high arousal. The aim is that your dog has limited opportunities to rehearse their reactive behaviour and therefore their levels of stress/cortisol hormones are as balanced as possible. To help with research on the benefit of the 'Doggy Holiday' please would you complete this questionnaire which includes questions about your understanding of implementing the programme as well as describing your observations of your dog pre and post the holiday?

About you:

Question 1

Did you understand the reasoning behind why the doggy holiday was necessary for your dog? **Yes** **No**

Please provide more detail if you wish to do so.

Question 2

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What were your initial feelings/thoughts about having to put your dog on a 'holiday'?

Question 2

Did you manage to put your dog on a holiday? **Yes** **No**

If **yes** how many days did you implement the programme?

1 **2** **3** **4** **5** **6**

If **No** please explain briefly why you found it difficult to implement.

Question 4

Which aspect did you find most difficult about the programme?

Question 5

Where you provided with enough information about alternative activities to do with your dog? **Yes** **No**

If **No** what other information would you have found useful?

Observations of your dog prior to the Doggy Holiday**Question 6**

Please circle as many of the behaviours that usually apply to your dog when they are aroused/ reactive on a walk:

Barking **Lunging** **Pulling** **Panting** **Raised hackles**

Whining **Ears pulled back** **Tail high** **Excessive salivation**

Describe any other body language that you see your dog display not listed.

How long do you normally walk your dog for each day?

Question 7

After a reactive outburst what do you notice about your dog's behaviour and body language when you get home?

How quickly would you estimate your dog returns to a calm state?

Observations of your dogs' behaviour after the Doggy Holiday.**Question 8**

How would you describe your dog's behaviour/ body language during the holiday period?

Question 9

Did you completely eliminate walking? **Yes** **No**

Did you reduce walking times? **Yes** **No**

What length of time did you reduce walking by?

Question 10

Please circle as many of the behaviours that applied to your dog when they became aroused/ reactive on a walk:

Barking **Lunging** **Pulling** **Panting** **Raised hackles**

Whining **Ears pulled back** **Tail high** **Excessive salivation**

Question 11

Would you say that your dog appeared calmer after the Doggy Holiday?

Yes **No** **No change in behaviour**

Question 12

Post Doggy holiday if your dog had a reactive outburst when out walking what did you notice about their behaviour and body language when you get home?

How quickly would you estimate your dog returned to a calm state?