# Minty

## The Clients

Mr and Mrs Smith are a couple in their mid 50s. They live in a detached house with a small backyard in suburban Xxx.

## The Dog

Minty is a 6 ½ year old neutered male of indeterminate breed.

## Presenting Problem Behaviour

Fear at the veterinary surgery, and during handling by the owners.

## Differentials

Fearful arousal and the behaviour linked with this state can arise from innate or learning-mediated sources, and can range from highly adaptive to pathological in nature (Lindsay 2001).

*Innate sources of fear*

Natural triggers of fear such as pain, sudden movements, loud noises, heights, isolation, and novel stimuli, often elicit unconditioned fearful arousal. This is adaptive in an evolutionary sense as this arousal induces species-typical behaviour which serves to decrease the subjectively aversive arousal experienced by the animal by decreasing the threat to the animal's fitness (Dawkins, 1989). Immobility, flight, and aggression are typical behaviours that serve to reduce threats to an animal's ability to pass on its genes. The context of the fearful arousal determines whether it is abnormal, inappropriate, or maladaptive for a dog's environmental milieu.

*Learning-mediated sources of fear*

Learning and experience can result in the development of fearful arousal towards stimuli that are not innately threatening. This can occur when a neutral stimulus is linked with an unconditioned fear-inducing stimulus, either through classical conditioning or operant conditioning, or both. Again, the context of this fear determines whether or not it is maladaptive.

Fearful arousal can take on a pathological dimension (phobia or generalised anxiety) when a stimulus that a dog finds highly aversive can not be predicted or controlled (Lindsay, 2001). It follows that low thresholds for fear can increase the likelihood of such pathological responses developing.

## Referral and Introduction

Mr and Mrs Smith sought the advice of xxx who they had obtained advice from five years prior to deal with Minty's fearful and aggressive behaviour, and to improve their general control of his behaviour.

Xxx referred the Smiths to me, and I made first contact with Mrs Smith over the phone. She advised me that Minty had lacerated his leg six months previously, and since the treatment of the wound at the veterinary clinic he needed to be muzzled for his recent annual check up. Even more concerning for Mrs Smith was Minty's newly developed fear of the application of his Frontline™ flea treatment. He was very "upset" by this and had attempted to bite Mr Smith, precipitating the Smiths' use of a muzzle to safely apply the flea treatment.

I organised a home-visit consultation in two days' time (August 2007), and advised Mrs Smith to avoid any situation that would "upset" Minty. This advice was given to minimise the chance that Minty's fearful response to the eliciting stimuli would be exacerbated, and also to minimise the chance of fear aggression by him.

During the two intervening days Mrs Smith's veterinary surgeon completed the CABTSG referral form (Appendix 1) and the Smiths completed the pre-consultation questionnaire (Appendix 2).

## The History

*Method :*

A consultation was held at the client's home. This allowed observation of the behaviour and interactions of both the dog and his owners, reducing reliance on the client's behavioural descriptions to assess the etiology of the problem. Direct observation also minimises the chance that behaviours may be totally missed that are relevant to the diagnosis (Overall, 1997).

To start the consultation process I asked the Smiths to describe the problems they were having with Minty, and to outline what they hoped to achieve from the consultation. Giving clients an opportunity at the start of the consultation to tell their "story" without interruption can help to establish a desirable client-consultant relationship, as it demonstrates a sincere interest in understanding - and therefore solving - their dog's behaviour problem (Danneman and Chodrow, 1982; Askew, 2003).

Prior to the consultation the Smiths had completed a pre-consultation questionnaire. This information combined with their initial outline of the problem, provided a starting point from which to develop hypotheses and questions to test them. The clients were guided through areas of importance - although care was taken not to suggest particular answers to them, either consciously or unconsciously (Evans, 1993). This probing stage of the consultation continued until most potential causes of the behaviour had been evaluated, and I was comfortable with a diagnosis of the problem.

*History Summary:*

*General:*

Minty was adopted by the Smiths from a rescue organisation at 18 months of age after being given up by two previous owners. He had been neutered at an unknown

time prior to adoption. Mr and Mrs Smith did not have much information about his previous homes, but were aware that Minty had bitten one of the prior female owners.

When the Smiths obtained Minty in 2003 he displayed highly fearful behaviour towards a variety of stimuli, including novel people, places, noises, and grooming by the Smiths. He was particularly fearful of children, especially if they were running or making loud noises. When on a lead he would sometimes bark and behave in a threatening manner towards people walking nearby.

In September 2003 Mrs Smith met with Xxx due to concern about Minty's fearful and sometimes uncontrollable behaviour. A program designed to improve Minty's response to commands, and to improve his understanding of what was desired/required by the Smiths, was implemented. Strict management of his interactions with children, and a counter-conditioning technique for interactions with them, was also outlined.

Since the consultation with Xxx Minty's behaviour has improved. He will now walk on a lead and ignore novel people, and does not approach people if he is off the lead. When people visit the house he is given a pig's ear as a diversion (and to counter-condition his response to the arrival of people), as he can behave in a territorial manner at the door (barking). Once people are in the house he either ignores them or is friendly. In general however, his reactivity to novel individuals and situations has improved only slowly over time. He is particularly reactive with people other than the Smiths in the back yard. At age 3 he bit a male relative of the Smiths on the lower leg, after the relative arrived unannounced in the yard. The bite punctured the skin.

Despite the three instances of aggression that the Smiths know of, this behaviour is the exception rather than the rule when Minty is anxious. Typically he removes himself from the situation if possible, or moves to place Mr or Mrs Smith between him and novel people/threatening stimuli.

Minty displays signs of fear when interacting with other boisterous or threatening dogs, but seems to be interested in interaction and even play if the other dog is not overly threatening. He will bare his teeth and snap if pushed or chased by other dogs. This aggressive behaviour is coupled with Minty attempting to remove himself from the situation. In general he does not seem very socially competent in his interactions with other dogs.

Minty is twice daily fed dry food of various brands, as well as left-over table scraps. He is exercised twice a day for 30-60 minutes. He does not have any pre-existing or current medical conditions.

The Smiths do not use positive punishers with Minty, and he responds well to positive reinforcement. He is particularly motivated by food treats which was evident during the consultation. Minty responds well to commands; the Smiths

rated his response to most commands as 8/10, with 9/10 for stay and 6/10 for come. He is “near perfect” in the house or garden, and “variable” outside. Minty is the only dog in the household. The Smiths owned a cross-bred dog prior to Minty.

*Fearful behaviour:*
Minty had never been confident during veterinary visits. However his confidence had increased slowly over time, so that he could be examined and vaccinated without the need for a muzzle. In December 2006 he cut his leg badly; this needed urgent veterinary attention. At the vet clinic attempts to inspect Minty’s wound resulted in Minty trying to bite the Smiths and the veterinarian, and to escape. He was restrained by the Smiths, and a muzzle was fitted to him.

Minty is now displaying significantly higher levels of fearful behaviour at the vet clinic, and a muzzle was again needed during his last annual check-up (June 2007). This behaviour at the vet clinic is one of the Smith’s primary concerns.

The fearful behaviour displayed at the vet clinic has also extended to the Smith’s monthly application of Minty’s topical flea treatment (Frontline™). The last attempt at treatment (July 2007) by Mr Smith resulted in Minty struggling to leave the area as the applicator was brought near his neck. The Smiths felt that his fearful reaction was exhibited once he smelt the Frontline™ and/or felt the contact of the liquid with his skin. It was necessary for Mr Smith to muzzle Minty and to hold him firmly in order to apply the flea treatment without being bitten. Once this was completed Minty retreated to the garden and “trembled for a while afterwards”. This aggression and fear is of great concern to the Smiths, as they feel that their dog is “going backwards”.

The Smiths are also concerned because Minty seems to have become very intolerant of “problem” situations, and gets into an “agitated” state very quickly. The most recent example was during an encounter with another dog when Minty became entangled in his own retractable lead. This caused Minty to snarl and growl. The Smiths felt that he would have bitten the other dog if his legs had not been restrained by the lead. They feel that they now have a “live-wire” dog which they cannot trust, despite the deep bond and affection they feel towards him.

*Observed behaviour during the consultation:*
Minty had been given a section of pig’s ear just before my arrival, so I first greeted him in the lounge as he was finishing the ear. He tentatively approached me as I crouched at a 90° angle from him, avoiding eye contact and holding a piece of cheese slightly away from my body. His approach was slow and his head, body, and tail were held low. He would only establish eye contact momentarily. Minty stretched slightly to reach the cheese, then retreated a metre or so once he had the treat. After this initial treat he approached me in a more confident manner for a second treat. I carry out this brief test of confidence on first meeting client’s dogs as this interaction can be the most threatening for the dog (and informative for me). Opportunities to observe fearful behaviour in the home can diminish as time passes

during a consultation and an animal becomes desensitised to the presence of a novel person.

At the start of the consultation he remained close to Mrs Smith and would orientate his head or eyes towards me if I made any movements. As the consultation continued Minty quickly become less reactive to my movements. In the later stages of the consultation I demonstrated a food-based counter-conditioning routine with Minty. A conditioned response to a clicker was quickly established with Minty as part of the training of this routine. After the first few treats he started to maintain long periods of eye contact, and quickly became highly focused on me in anticipation of the next food treat. I would describe him as having high motivation for food.

Once he had become more confident with me I was able to handle him around the head and shoulders. In order to test which stimuli involved with the application of flea treatment caused Minty to show signs of fear, we opened a Frontline™ applicator and allowed Minty to smell it. He did not show signs of fear in the presence of the open applicator, or when it was touched to his neck. However when his collar was held and slight pressure applied to it, he showed signs of fear and attempted to pull back on his collar. This behaviour occurred with or without the Frontline™, but was most pronounced when the hand not holding his collar was brought behind his head out of sight.

It was possible over a period of a few minutes to start to counter-condition (with a clicker and food) Minty's fearful behaviour during mild restraint of his collar. After a short session I was able to place my hand behind his head as I pulled slightly on his collar.

## Assessment

Minty has a low threshold for fear towards many novel or threatening stimuli.
He has become sensitised to cues predicting a repeat of the traumatic treatment for his leg laceration. The aggression is an attempt to displace the threatening stimuli from his immediate area.

## Initiating and Maintenance Factors

*Physiological influences:*

*Genetic predisposition:*

A dog's genotype has been shown to influence fear thresholds (Murphree *et al., 1967; Murphree*, 1973). Minty is of uncertain breeding, therefore the influence of his breed or parental genetics is not possible to assess. Minty's genetics are, however, a potential contributory factor for his fearful behaviour.

*Veterinary considerations:*

The Smith's veterinarian did not indicate somatic causes for Minty's behaviour.

*Learning-mediated influences:*

*Early experience:*

The detrimental effects of limited early environmental and social experience on later behaviour of dogs have been well documented (Scott and Fuller, 1965; Melzak and Thompson, 1956; Pfaffenberger, *et al.*, 1962; Fox and Stelzner, 1967; Fisher, 1955; Hetts, *et al.*, 1992; Hubrecht, 1995; O'Farrel, 1992; Wright, 1983). It has also been clearly documented that intensive socialisation later in life often does little to remedy the maladjusted behaviour of an inadequately-socialised dog (Scott and Fuller, 1965, Fuller, 1964; Freedman, *et al.*, 1961).

Minty's early experience is unknown, so the influence of early experience on his adult behaviour can not be explored further. However the possibility of inadequate environmental and social referencing remains a likely causal factor influencing his fearful behaviour.

It is important to note that the effect of early experience may not only influence a dog's learning-mediated expectations of its social and environmental milieu, but may also have a strong influence on its physiological development. This has been shown to apply to rats, where early environmental stimulation increases adaptability to stressors in general (Levine, 1960; Levine *et al.*, 1967, Adler, 1970). It has also been shown that early environmental stimulation can result in the development of more mature EEG patterns in puppies and superior problem-solving abilities (Fox and Stelzner, 1966). The sensitisation of a dog's nervous system as a result of inadequate early experience may significantly retard the progress that can be made when attempting to effect behavioural change.

*Conditioning:*

There is a small possibility that Minty's fearful behaviour in general, prior to the wounded-leg episode at the vets, may have been due to traumatic experiences prior to the Smiths obtaining him. This seems unlikely however, due to the generalised and persistent nature of his anxious behaviour. If prior traumatic experiences have influenced his fearful behaviour, they are unlikely to be the sole reason for his fearful disposition (Lindsay, 2001).

It is likely that the experience at the vets was highly aversive for Minty in a number of ways, and has increased his vigilance of, and subsequent fearful response to, cues that might act as discriminative stimuli for the possibility of a repeat of this aversive experience. This is of course normal adaptive behavioural change to an aversive experience – the classical and operant conditioning mediating this change serves to increase the likelihood that the fitness of the individual is improved (Dawkins, 1989). The problem with this case is that the thresholds for elicitation of a fearful emotive state have been "set" too low as a result of the genetic and socialisation factors mentioned above, and as a result, Minty's behaviour is maladaptive for his urban human environment.

It is likely that the vet clinic itself was a moderately threatening environment for Minty, with novel people, dogs, and other stimuli. As a result he may have been in a

heightened state of sympathetic arousal, but due to the desensitisation to the clinic he had experienced during prior visits, he may not have been at the point where he was trying to escape or displace perceived threats through the use of aggression.

This would have changed once he started to be examined. The combination of restraint, pain, and social threat from the unfamiliar vet's proximity to Minty, would have forced Minty into a state of high sympathetic arousal. His attempts to escape and displace the threatening stimuli through aggression resulted in increased efforts to restrain him. This would have served to further increase Minty's level of fear and panic to very high levels, maximising the detrimental effects of the situation on his later behaviour. This is particularly relevant to this case, as individuals predisposed to low thresholds for fear are most susceptible to lasting disturbances due to aversive experience (Pavlov, 1927/1960; in Lindsay, 2001).

*Owner factors:*
The Smiths have a good general level of control with Minty, although they struggle to manage his behaviour when he becomes fearful. Through exposure to urban stimuli over the past four or five years, a positive consistent relationship with the Smiths, and a minimum of aversive experiences in general, Minty has become more confident. This has masked to some extent the Smith's perception of Minty as a dog with very low thresholds for fear. When Minty attempted to escape from Mr Smith during the Frontline™ application, Mr Smith felt that Minty's behaviour was unacceptable due to the high level of confidence that Minty normally exhibits with the Smiths. Because of this Mr Smith felt that it was appropriate to physically restrain Minty to apply the Frontline™. This experience would have served as a significant confirmation to Minty that close physical proximity and mild restraint were cues predicting the highly traumatic muzzle/restraint/pain event, and would have surely exacerbated his already fearful behaviour in such circumstances, and in general.

Prior to the consultation the Smiths felt that despite the wounded-leg episode at the vets, and the Frontline™ episode, that Minty's behaviour was hard to understand and that he was "going backwards". This perception increased the likelihood of them allowing further events that may have contributed to Minty's fearful behaviour.

## Treatment Plan

*Aims*

1. Safety – prevent Minty injuring people when fearful
2. Stop Minty's fear worsening
3. Reduce Minty's fear in the veterinary clinic and during handling by the Smiths.

### Method

The influence of genotype and early experience, and the interaction between the two, are significant causal factors in the development of excessive fearful behaviour

in many dogs (Overall, 1997; Lindsay, 2001; Askew, 2003). Minty's recent traumatic experiences at the vet clinic and at home, combined with his fearful temperament, has resulted in a rapid deterioration in his thresholds for fear, particularly towards stimuli that may act as discriminative stimuli for those traumatic events.

It is not possible to modify the genetic or early experience factors contributing to this problem. Attempts can be made, however, to ameliorate the physiological and behavioural effects of these influences.

Exposure to the stimuli that elicit and exacerbate Minty's fearful behaviour can be modified. This is a vital component of the treatment plan. Strictly avoiding situations that provoke a strong fear response from Minty, and teaching him to expect a positive and/or controllable outcome in fearful situations is critical to the treatment plan.

Treatment Programme

*Client education.*

Before outlining a treatment plan for Minty, it was important to outline the initiating and maintenance factors to Mr and Mrs Smith. By increasing their understanding of why aspects of the programme would effect change, it was hoped their compliance with the programme would be increased. Client compliance is an important factor in treatment success (Marder, 1996; Polsky, 1994).

*Safety management measures.*

- *Minty should be on a head halter or muzzled if the behaviour of nearby people (especially children) can not be predicted or controlled. To avoid the muzzle or halti developing further as conditioned stimuli for fear-inducing situations, it needs to be worn prior to and during pleasurable events. With the halti this includes meals, food treats, and playing with a ball. With the muzzle a section should be cut from the end so that food treats can be passed to him for the short periods he initially wears the muzzle. The muzzle and halti should only be removed if Minty is accepting their presence.*

The necessity of this safety advice was reinforced to the Smiths by further explanation of the interaction between Minty's low thresholds for fear and the inherent unpredictability of people. It was important to reinforce to them the risk that Minty posed to humans, despite the implementation of the treatment programme I would be recommending.

The main points of the Dangerous Dog Act 1991 were outlined to the Smiths. By explaining the legal implications of an aggressive episode by Minty, the importance of employing safety measures with him was reinforced.

*Avoidance of strong fear-eliciting situations.*

- *Minty must not be subjected to experiences where he becomes highly fearful. In particular, he must not be restrained in a manner similar to the Frontline™ or veterinary clinic episode.*

Allowing Minty to become highly fearful would contribute to or exacerbate his current fearful behaviour, and retard or reverse the systematic desensitisation and counterconditioning aspect of the treatment programme. The development of an expectancy of failure when dealing with threats is a potent source of generalised anxiety and fear (Lindsay, 2001).

- *In situations where physical examination of Minty is unavoidable, he should be sedated. The Smiths should discuss this issue with their vet in order to obtain a suitable sedative, and to decide on a contingency plan if the initial dosage/drug is not suitable. Contact was made with the Smith's vet to outline my rationale for the use of a benzodiazepine for this purpose. It was recommended that a muzzle be used whilst Minty was in the veterinary clinic.*

While complete avoidance of panic-inducing situations would be ideal, it may not be possible in practice. In addition to anxiolytic effects, the amnesiac properties of a benzodiazepine such as diazepam can further minimise the detrimental behavioural effects of forced exposure to phobic situations (Landsberg *et al.,* 2003; Bowen, 2006). Considering Minty's previous aggression, a muzzle should be used due to the potential disinhibitory effect of benzodiazepines on aggression thresholds (Lindsay, 2004). Smiths could see the benefit of using a sedative for vet visits, and did not have any reservations about sedating Minty.

- *For Minty's annual veterinary check up the Smiths may be able to discuss with their vet a minimally intrusive method of examination, or even a home visit. This may mean that he does not need to be sedated. If however it is necessary to physically examine Minty, he needs to be sedated (unless the Smiths have progressed through the systematic desensitisation program to the extent that he is relaxed and accepting of handling by the vet at the clinic).*

Minty's annual veterinary check up is one unavoidable fear-inducing situation that can be predicted. It was important to address this inevitable situation, to minimise the chances that improvements in Minty's behaviour is not adversely affected by an unavoidable traumatic event.

<u>*Desensitisation and counter-conditioning programme.*</u>

- *The primary component of the program that will actively help reduce Minty's fear of the veterinary clinic and other handling situations is a systematic desensitisation with counter-conditioning programme. The Smith's primary focus for the moment is the vet clinic, vet staff, and restraint-like handling. To desensitise Minty to these situations required precise identification of what Minty found frightening. Once this was done, approximations to the full fear-inducing situation were developed (ranging from the footpath near the vet clinic, to handling by a vet in a consultation room). The Smiths need to systematically work through these approximations while employing the counter-conditioning routine outlined below. Once he is relaxed and confidently completing the counter-conditioning routine in one situation, the Smiths need to move on to the next. If Minty becomes too fearful to complete the counter-conditioning routine, the level of threat needs to be decreased.*

Extensive discussion and subsequent notes provided the Smiths with the details of this protocol. Systematic desensitisation and counter-conditioning techniques are widely recognised as being an effective method to reduce fear towards specific stimuli (Landsberg *et al,.* 2003; Overall, 1997; Lindsay, 2001; Askew, 2003; Horwitz *et al.,* 2000)**.** Although Minty can react fearfully to a variety of stimuli, it was decided to ask the Smiths to focus on the vet clinic and frontline application, as these situations were their primary concern. I also wanted to keep the focus of the behaviour modification programme narrow, so the Smiths had something discrete to work on.

- *The primary tool for the counterconditioning aspect of the systematic desensitisation plan is a "sit" then "look" routine. The Smiths should use a clicker to reward Minty for maintaining eye-contact with them when requested. The primary purpose of the "Look" routine is to enable them to positively reinforce Minty for relaxed behaviour in the vicinity of things he finds threatening.*

The benefits of a sit-stay routine as a counter-conditioning tool were observed by Victoria Voith in the early 1970s, and have been outlined by Lindsay (2004). The use of eye-contact as a target behaviour for positive reinforcement, rather than the less discrete "stay", is useful as it acts as a clear indicator that a dog is relatively relaxed. This is important as it increases the likelihood that relaxed behaviour is positively reinforced rather than behaviour resulting from fear. A clicker is an effective tool when trying to accurately reinforce relaxed behaviour (Reid, 1996). A brief, crisp, and highly-conditioned bridging stimulus such as a clicker is also useful when attempting to induce maximal positive emotional arousal to effect the counter-conditioning process (Lindsay, 2004). Minty's high food motivation made him a good candidate for this routine.

The "look" relaxation routine is not only effective as a technique to positively reinforce relaxed behaviour; by establishing a routine that is always safe and one where a dog has the choice to respond or move away, we enable the dog to predict and control the outcome of threatening situations. This is a crucial factor in decreasing fear and anxiety (Bandura, 1977; Lindsay,2004).

- *Before using the routine in situations that Minty is fearful in, the Smiths need to practice it extensively in non-threatening situations.*

I have found that the tendency of people to focus their training efforts at times when their dog is behaving inappropriately can mean that the "look" cue can potentially become a conditioned stimulus for fear-inducing stimuli. I have found it vital to emphasise the importance of easy practice sessions in order to avoid this, and to maximise the counter-conditioning power of the routine by establishing a substantial positive conditioning history, and expectancies of comfort and safety (Lindsay, 2004).

- *I emphasised to the Smiths that while systematic desensitisation and counter-conditioning programme was the most effective way to deal with Minty's fear, the progress of the programme would be dependent on Minty, and could not be rushed. I also reiterated that they should not hesitate to call me if they have any questions about the implementation of this technique.*

It has been found that desensitisation and counter-conditioning recommendations have a low level of client compliance, possibly because they are difficult and time-consuming to apply (Sherman *et al*., 1996). By outlining to clients the importance of implementing the routine, giving a reasonable timeframe for improvement, and encouraging clients to contact me if any questions arose regarding the technique, it was hoped that client compliance with the recommendations would be improved. Particular care was taken to emphasise the importance of allowing Minty's behaviour to dictate the progress of the programme, as from experience I find that once clients have been shown a counter-conditioning routine they are tempted to use it in situations where their dog's arousal or the level of threat is too high for the routine to be effective. I now take great pains to explain and demonstrate the rationale and details of any counter-conditioning routine to prevent its degeneration into an ineffective distraction/bribe routine.

- *If Minty is relaxed enough to take food treats from people at the vet clinic, this can be done in place of the "look" routine. Care should be taken to ensure that Minty is not inadvertently threatened – the Smiths were advised to use their open-nosed muzzle for Minty in this situation.*

The delivery of food from people in the vet clinic is something that will be easier for the Smiths to implement (compared with the "look" routine), but it will still facilitate desensitisation and counter-conditioning effects. By making the behaviour modification programme as easy as possible to carry out, it is hoped that the Smith's compliance with the programme will be maximised.

*No aversives*

- *The Smiths should not use punishment if Minty behaves inappropriately.*

While punishment may partially or temporarily suppress overt expression of fear-related aggression or avoidance behaviour, the underlying emotive state will remain or escalate (Lindsay, 2001). This can lead to a more difficult and unpredictable situation, and is also not in the best interests of the dog (Horwitz *et al,.* 2002).

*Improve response to commands*

- *Mrs Smith should continue to spend time with Minty practising obedience commands. A few extra suggestions where made regarding training techniques, and the use of the clicker during training.*

In addition to the obvious management advantages, improved owner control increases the predictability of a dog's environment which is thought to reduce anxiety (Overall, 1997). Mrs Smith enjoyed training Minty, so this suggestion did not involve any extra commitment or inconvenience for Mrs Smith.

*Diet*

- *The Smiths were advised that a low protein diet (less than 18% protein), may help decrease reactivity and improve learning potential with Minty. A plate of pasta three hours after his main low protein meal was also suggested.*

Serotonin, a known anxiolytic, is synthesised in the brain by the hydroxylation of the essential amino acid tryptophan. Due to the poor affinity of the enzyme that

catalyses this reaction for tryptophan, the synthesis of serotonin can be increased by increasing brain tryptophan levels. Tryptophan and other large neutral amino acids (LNAA) are transported with equal efficiency by the blood-brain barrier transportation molecule, which means that plasma tryptophan must compete with other LNAA for transport sites (Pardridge, 1977).

Because proteins are often low in tryptophan and high in LNAA, a high-protein meal will reduce the proportion of plasma tryptophan to LNAA, retarding the transport of tryptophan across the blood-brain barrier. In contrast, low-protein diets increase the ratio of tryptophan to LNAA, resulting in a greater transfer of tryptophan to the brain. An additional way in which low-protein diets increase brain tryptophan levels is linked to the fact that such diets are often richer in carbohydrates. A carbohydrate-rich meal causes an increase in the secretion of insulin, which significantly lowers plasma LNAA levels (mostly by causing them to be transferred to skeletal muscle), while having little effect on tryptophan (Fernstrom *et al.*, 1979). It has been shown that low-protein, high-carbohydrate meals raise tryptophan levels in the brain (Fernstrom & Wurtman, 1971), while high-protein meals can inhibit serotonin synthesis (Fernstrom & Wurtman, 1972). Strong (1999) recommends feeding carbohydrate three hours after the initial consumption to maximise tryptophan transfer across the blood/brain barrier.

Aspects Considered, But Not Implemented

*Pheromones*

- *The use of dog appeasement pheromone (DAP) as an adjunct to the behaviour modification program was raised with the Smiths, however they decided to implement the programme without the use of a collar or home diffuser and to assess their progress before considering the use of DAP. The price of the DAP products was the main reason for them deciding to assess Minty's progress before trying DAP. I indicated to them that the DAP products may help, but that they were not a critical component of the treatment plan.*

The mammary appeasine "DAP" is thought to reduce the perceived aversiveness of an environment (Mills, 2005). Research on its efficacy is limited, but it has been shown to raise thresholds for fear in dogs (Shepherd & Mills, 2003), which in turn may facilitate a desensitisation and counterconditioning programme.

*Pharmacological – TCAs and SSRIs*

- *The use of TCAs /SSRIs as adjuncts to the behaviour modification program may have assisted the behaviour modification programme by increasing fear thresholds. The use of drugs with Minty was briefly raised with the Smiths, so they were aware of the possibility. We agreed that they would implement the programme without the use of a pharmacological aid, and assess their progress before discussing the use of a drug with their veterinarian.*

Drugs that reduce anxiety without sedating the dog to the point that it cannot learn, may facilitate systematic desensitisation and counterconditioning protocols (Walker et al., 1997). While the efficacy of modern tricyclic antidepressants (TCAs) and selective serotonin reuptake inhibitors (SSRIs) for the treatment of canine anxiety

disorders has been documented (Simpson, 1999; Overall, 2001; King et al., 2000; Hewson, 1998), conclusive clinical evidence supporting the efficacy of such drugs is hardly overwhelming (Askew, 2003). Due to the apparently low risk of significant undesirable side effects, the use of such drugs may be indicated in recalcitrant cases, as without pharmacological intervention desensitisation programs may prove difficult or ineffective due to the ease with which a dog becomes fearful or anxious.

Administration

At the conclusion of the consultation the Smiths were given a hand-written sheet with the main points we had discussed. This ensured that they had a written summary of the proposed treatment programme for the period between the consultation and the arrival of the full treatment protocol notes.

Full notes were posted to the Smiths two days after the consultation. The notes were personalised for the case in an effort to increase the relevance of the notes, and therefore client compliance (Egan, 1994). While it is important to provide sufficient detail so that recommendations are carried out appropriately (Askew, 2003), it is also important that the main points of the treatment programme are not lost in the detail. For this reason the notes were structured with a concise "stick-on-the-fridge" page including the diagnosis and main treatment elements, which was then followed by a "details" section with more precise recommendations (such as recommended stages for the systematic desensitisation to the veterinary clinic).

The Smiths were asked to contact me two weeks after the consultation to outline any improvements or setbacks, and to provide an opportunity for them to discuss any issues or questions that had arisen. This provided a planned platform for discussion as well as a deadline situation, which may encourage clients to begin immediate implementation of the treatment programme (Askew, 2003).

## Follow Up

*Two weeks*

Mrs Smith made contact as requested. She had been concentrating on the relaxation routine at home and she described Minty's response to the look routine as "obsessive", as was his reaction to the clicker. Her primary concern was that this did not always translate to the same response when outside. In general she felt more comfortable with Minty's behaviour because she felt she understood the underlying reasons for the behaviour. Some work had been done with handling Minty's collar, but she was still in the early stages of this desensitisation. They had not yet visited the area near the veterinary clinic due to time constraints. I reiterated the inevitability of Minty not responding perfectly to the "look" routine in situations that he might feel threatened in. I also emphasised that awareness and management of stimuli that Minty found threatening was important - but not to be discouraged if Minty became too fearful to complete the relaxation routine.

*Six weeks*

Six weeks after the consultation the Smiths felt that my recommendations were "proving successful" and that Minty was "doing really well". The Smiths could now apply his Frontline™ treatment, and they felt far more confident of his behaviour and their ability to manage and modify it for the better. Mrs Smith had visited the parking lot of the veterinary clinic twice, and had succeeded in rewarding Minty for relaxed behaviour. She felt they were ready to try the routine inside the clinic but had not found time to progress to this stage. Unfortunately, Minty had been trusted to remain unmuzzled with two boys who he seemed relaxed with. During an impromptu sword fight between the boys in a restricted area Minty had been inadvertently cornered and had snapped at the face of one of the boys. This resulted in a raised scratch but did not puncture the skin. Mrs Smith was highly regretful that she had put the boys and Minty in this situation, and had acknowledged that she had again been lulled into a sense of false confidence in Minty's behaviour. I reiterated her responsibility to ensure the safety of other people and Minty by managing potential threatening stimuli or ensuring safety through a muzzle if this was not possible.

*Five months*

Mrs Smith had visited the veterinary clinic reception room with Minty on a number of occasions. She had succeeded in employing the "look" routine with top-tier treats, and the vet nurses had been rewarding Minty for sitting. Minty's anxiety had decreased slightly with each visit. On one occasion he barked at an open door in the reception room that was usually closed, which indicates that his fearful-arousal in the clinic may still be elevated. The veterinarian that treated Minty for the leg-wound approached Mrs Smith and Minty on one of the visits. Minty did not interact with the veterinarian and moved close to Mrs Smith. Mrs Smith did not take the opportunity to try a "look" routine, or to ask if the veterinarian would hold or throw a food treat for Minty. I pointed out that counter-conditioning sessions with the vet, and in empty consultation rooms, would be the ideal next step. The somewhat impractical nature of these suggestions was raised with Mrs Smith, but she felt that the reception staff and nurses at the clinic were interested enough in Minty's progress to allow her use a consultation room. I suggested that the best utilisation of the brief time she would probably have with a vet would be to have the vet give Minty a number of very special food treats in the half minute Mrs Smith could capture the vet for.

Application of Frontline™ continues to be no problem.

In general the Smiths are happy with Minty's behaviour, but expressed sadness and frustration that he sometimes "goes backwards". I reiterated to Mrs Smith that it was likely the unpredictable and threatening nature of some external stimuli were causing Minty to become fearful and defensive on occasion, rather than his behaviour regressing in general. I used his improvement in behaviour since the consultation, and in the years since they adopted him, to help illustrate this point. I felt it was necessary to do this to encourage Mrs Smith to continue with the time and effort of desensitisation and counter-conditioning.

The Smiths had not changed Minty to a low protein diet, so I reiterated the reasons for this recommendation. I also recommended that they try a DAP collar. Mrs Smith decided to give these recommendations a try.

## Evaluation

The primary concern for the Smiths at the time of the original consultation was Minty's fear and aggression at the veterinary clinic, and the apparent generalisation of this behaviour towards them. The treatment programme succeeded in preventing any worsening of his fearful behaviour, and in desensitising Minty to restrictive handling by the Smiths and application of his flea treatment. Improvement in Minty's behaviour at the vet clinic is encouraging, although more sessions are needed to desensitise Minty adequately to the clinic and the veterinarian. The general increase in confidence in Minty's behaviour, along with the Smiths' increased understanding of the causes of Minty's behaviour, is another positive outcome.

My main concern at this point is that Minty will inevitably be taken to the veterinary clinic due to a medical issue and pushed into a state of fearful arousal, causing a regression to pre-consultation levels of fear. For this reason I reiterated to Mrs Smith the importance of developing a contingency plan for this possibility, and for his next medical check-up.

The incident with the boys was highly regrettable, both for the risk it posed to the boys, the legal implications of a complaint if one had been made, and the detrimental effect it may have had on Minty's confidence. I do not feel that anything more could have been done during the consultation or in the written notes to have minimised further the risk of the Smiths allowing this situation to develop.

## References


Adler R. (1970) The effects of early experience on the adrenocortical response to different magnitudes of stimulation. *Physiology and Behavior,* **5**(8): 837-839.

Askew HR. (2003) *Treatment of behaviour problems in dogs and cats (2nd Ed).* Blackwell Science, Oxford.

Bandura A. (1977) Self-efficacy: Toward a unifying theory of behaviour change. *Psychol Rev,* **84:** 191-215.

Bowen J. (2006) Treatment summary for vets (Noise Phobia). *Sounds Scary reference material, Virbac.*

Danneman PJ and Chodrow RE. (1982) History taking and interviewing techniques. *Veterinary Clinics of North America: Small Animal Practice,* **12**(4): 587-592.

Dawkins R. (1989) *The Selfish Gene* (new edition). Oxford University Press, Oxford.

Egan G. (1994) *The Skilled Helper* 5th Edition. Brooks/Cole, CA.

Evans RK. (1993) Canine behaviour disorders. *Veterinary Technician,* **14**(9): 535-540.

Fernstrom JD and Wurtman RJ. (1971) Brain serotonin content: Increase following ingestion of carbohydrate diet. *Science,* **174**: 1023-1025

Fernstrom JD and Wurtman RJ. (1972) Brain serotonin content: Physiological regulation by plasma neutral amino acids. *Science,* **178**: 414-416

Fernstrom JD, Wurtman RJ, Hammarstrom-Wiklund B, Rand WM, Munro HN, and Davidson CS. (1979) Diurnal variations in plasma concentrations of tryptophan, tyrosine, and other neutral amino acids: effect of dietary protein intake. *American Journal of Clinical Nutrition,* **32**: 1912-1922.

Fisher AE. (1955) thesis, Pennsylvania State Univ. Cited in Scott J. (1962) Critical periods in behavioural development. *Science,* **138**: 949-958.

Fox MW and Stelzner D. (1966) Behavioural effects of differential early experience in the dog. *Animal Behaviour,* **14**: 273-281.

Fox MW and Stelzner D. (1967) The effects of early experience on the development of inter and intraspecific social relationships in the dog. *Animal Behaviour,* **15**: 377-386.

Freedman D. (1958) Constitutional and environmental interactions in rearing of four breeds of dogs. *Science,* **127**: 585-586.

Freedman D, King JA, and Elliot O. (1961) Critical periods in the social development of dogs. *Science,* **133**: 1016-1017.

Fuller JL. (1964) Effects of experimental deprivation upon behaviour in animals. *Proceedings World Congress of Psychiatry (Montreal),* **3**: 223-227. Cited in: Markwell PJ and Thorne CJ. (1987) Early behavioural development of dogs. *Can Pract,* 12: 32-34.

Hetts S, Clark JD, Calpin JP, et al. (1992) Influence of housing conditions on beagle behaviour. *Applied Animal Behaviour Science,* **34**: 137-155.

Hewson CJ, Luescher A, Parent JM, Conlon PD, and Ball RO (1998) Efficacy of clomipramine in the treatment of canine compulsive disorder. *Journal of the American Veterinary Medical Association,* **213** (12): 1760-1766.

Horwitz DF, Mills DS, and Heath S. (2002) *BSAVA Manual of Canine and Feline Behavioural Medicine.* BSAVA, Glouchester.

Hubrecht RC. (1995) Enrichment in puppyhood and its effects on later behaviour in dogs. *Laboratory Animal Science,* **45**: 70-75.

King JN, Simpson BS, Overall KL, Appleby D, Pageat P, Ross C, Chaurand JP, Heath S, Beata C, Weiss AB, Muller G, Paris T, Bataille BG, Parker J, Petit S, and Wren J. (2000) Treatment of separation anxiety in dogs with clomipramine: results from a prospective, randomized, double-blind, placebo-controlled, parallel-group, multicenter clinical trial A*pplied Animal Behaviour Science,* **67**(4): 255-275.

Landsberg G, Hunthausen W, and Ackerman L. (2003) *Handbook of Behaviour Problems of the Dog and Cat.* Butterworth Heinmann, Oxford.

Levine S. (1960). Stimulation in infancy. *Scientific American,* **202**: 80-86.

Levine S, Haltmeyer GC, Karas GC, and Denenberg VH. (1967) Physiological and behavioural effects of infantile stimulation. *Physiology Behaviour,* **2**: 55-59.

Lindsay SR. (2000) *Handbook of Applied Dog Behaviour and Training: Adaption and Learning.* Iowa State University Press, Iowa.

Lindsay SR. (2001) *Handbook of Applied Dog Behaviour and Training: Etiology and Assessment of Behaviour Problems.* Iowa State University Press, Iowa.

Lindsay SR. (2004) *Handbook of Applied Dog Behaviour and Training: Protocols and Procedures.* Iowa State University Press, Iowa.

Marder A and Reid JP. (1996) Canine behaviour problems: behaviour modification, obedience, and agility training. *Compendium on Continuing Education for the Practicing Veterinarian,* **18**(9): 975-1018.

Melzak R and Thompson WR. (1956) Effects of early experience on social behaviour. *Canadian Journal of Psychology,* **10**: 82-90.

Murphree OD., Dykman RA., and Peters, JE. (1967) Genetically determined abnormal behaviour in dogs: results of behavioural tests. *Conditioned Reflex* **2**: 199-205.

Murphree OD. (1973) Inheritance of human aversion and inactivity in two strains of pointer dogs. *Biological Psychiatry,* **7**: 23-29.

O'Farrel V. (1992) *Manual of Canine Behaviour.* Cheltenham, England, British Small Animal Veterinary Association.

Overall KL. (1997) *Clinical Behavioural Medicine for Small Animals.* Mosby, St Louis.

Pardridge WM. (1977) In: Wurtman RJ and Wurtman JJ (Eds) *Nutrition and the Brain,* Vol 1, 141-204. Raven Press, NY.

Pavlov IP. (1927/1960) *Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex.* GV Antrep (Trans) Dover, New York. Cited in: Lindsay SR. (2001) *Handbook of Applied Dog Behaviour and Training: Etiology and Assessment of Behaviour Problems.* Iowa State University Press, Iowa.

Pfaffenberger CJ, Scott JP, and Fuller JL, et al. (1962) *Guide dogs for the blind: Their selection, development and training.* Elsevier Scientific Publishing Company, Amsterdam.

Polsky RH. (1994) The steps in solving behavior problems. *Veterinary Medicine*, **89**(6): 504, 506-507.

Reid P. (1996) *Excel-erated Learning.* James and Kenneth.

Scott J and Fuller JL. (1965) *Genetics and the Social Behaviour of the Dog.* University of Chicago Press, Chicago.

Shepherd G. and Mills DS. (2003) Evaluation of dog-appeasing pheromone as a potential treatment for dogs fearful of fireworks. *Veterinary Record,* **152**(14): 432-436.

Sherman CK, Reisner IR, Taliaferro LA, and Houpt KA. (1996) Characteristics, treatment, and outcome of 99 cases of aggression between dogs. *Applied Animal Behaviour Science,* **47**: 91-108.

Simpson B. (1997) Treatment of separation-related anxiety in dogs with clomipramine. Results from a multicentre, blinded, placebo controlled clinical trial. In Mills DS., Heath SE., and Harrington LJ. (ed.) *Proceedings of the First International Conference on Veterinary Behavioural Medicine.* South Mimms, Universities Federation for Animal Welfare, 143-154.

Strong V. (1999) *The Dog's Dinner.* Ed S. Whitehead. Alpha, Windsor.

Walker R, Fisher J, and Neville P. (1997) The treatment of phobias in the dog. *Applied Animal Behaviour Science,* **52**: 275-289.

Wright JC. (1983) The effects of differential rearing on exploratory behaviour in puppies. *Applied Animal Ethology,* **10**: 27-34.

# Zep

## The Clients

The Browns are a couple in their early 50s. They live in a detached house with a medium backyard in a small town near Xxx. They have three daughters – Gertrude (16) and Edna (14) live at home, while Ethel (21) is married and lives elsewhere.

## The Dog

Zep is an entire male 4 year-old wire-haired fox terrier.

## Primary Presenting Problem Behaviour

Barking when people leave the house, and overnight.

## Differentials

Barking has become a prominent behaviour in dogs as a result of domestication (Shepherd, 2002). It is a behaviour that has many possible etiologies, and its expression may be influenced by a mixture of motivations (Lindsay, 2000):

- Response to threats

When faced with any stimuli perceived as a threat, barking may be used in an attempt to displace the threat, and to warn group members of the presence of the threat (Lindsay 2001). This behaviour may be more likely when a dog is in its own territory (Overall, 1997). Fear and anxiety may increase the likelihood of this form of barking.

- Solicitous behaviour

Barking can be used in an effort to solicit social interaction, food, and other resources that are desired by the dog but controlled by another individual.

- Separation-induced

Barking can be used in an attempt to regain contact with other members of the group. Fear and anxiety may influence the expression of this form of barking, which often begins as owners leave the household (Landsberg *et al,* 2003).

- Frustration-induced/displacement behaviour

Barking may be exhibited as displacement behaviour if the dog is motivated to perform some course of action that is thwarted (Askew, 2003).

- Predatory

Dogs may bark when engaging in predatory behaviour (Askew, 2003). The function of this may be to solicit hunting behaviour by other members of the social group (Overall, 1997).

- Group-facilitated

Thresholds for barking may be reduced when exposed to barking from other members of the dog's social group (Lindsay, 2000).

- Stereotypic barking

Any active behaviour pattern that is performed often, without environmental factors to stop or at least vary the behaviour, can result in a behaviour pattern that over time becomes less and less dependent on the environment for its maintenance (Mason, 1991).

- Cognitive dysfunction

Neurological deterioration or pathology can result in increased levels of barking (Landsberg, *et al,* 2003).

Thresholds for barking can vary between dogs (Askew, 2003). If the threshold for barking is very low, the etiology of the barking can be more difficult to determine. In a similar vein, arousal can reduce barking thresholds, which can mean that easily aroused dogs can bark in response to minimal stimulation.

## Referral and Introduction

Mrs Brown was referred to me by her veterinary surgeon. First contact with her was made over the phone. She advised me that Zep became anxious when they left the house, and would bark repeatedly. He had also started to scratch and vocalise at the kitchen door during the night. Another problem was his highly exuberant behaviour with visitors, which the Browns often managed by locking him in another room. He became distressed when separated from people in this manner. These behaviours had been happening for some time, but the Browns had just moved into a new house, and they wanted to make an effort to deal with Zep's behaviour problems.

I organised a home-visit consultation for the following week. Due to the long-running nature of the problems, I did not feel it was necessary to give any behavioural first aid recommendations, other than to ask Mrs Brown to ensure that no one in the family responded to Zep's scratching or vocalisations during the night. I suggested that for the next few days something should be placed in front of the door, so Zep's behaviour could be ignored without damage to the door. During the intervening days Mrs Brown's veterinary surgeon completed the CABTSG referral form (Appendix 1) and the Browns completed the canine pre-consultation questionnaire (Appendix 2).

## The History

*Method :*

A consultation was held at the client's home. This allowed observation of the behaviour and interactions of both the dog and his owners, reducing reliance on the client's behavioural descriptions to assess the etiology of the problem. Direct observation also minimises the chance that behaviours may be totally missed that are relevant to the diagnosis (Overall, 1997).

I had organised for both Mr and Mrs Brown to attend the consultation, but Mr Brown had been held up at work, and arrived half way through the consultation. To start the consultation process I asked Mrs Brown to describe the problems they were having with Zep, and to outline what she hoped to achieve from the consultation. Giving clients an opportunity at the start of the consultation to tell their "story" without interruption can help to establish a desirable client-consultant relationship, as it demonstrates a sincere interest in understanding - and therefore solving - their dog's behaviour problem (Danneman and Chodrow, 1982; Askew, 2003).

Information provided in the pre-consultation questionnaire, combined with their initial outline of the problem, provided a starting point from which to develop hypotheses and questions to test them. The clients were guided through areas of importance, though care was taken not to suggest particular answers to them, either consciously or unconsciously (Evans, 1993). This probing stage of the consultation continued until most potential causes of the behaviour had been evaluated, and I was comfortable with a diagnosis of the problem.

*History Summary:*

*General:*

Zep was adopted by the Browns from a breeder at 10 weeks of age. They had not seen exactly where Zep had been brought up during this early period, but the breeder's property was rural. Once Zep had finished his vaccinations at 14 weeks, Mrs Brown took him out with her regularly when she left the house. This continued for some time, and often consisted of Mrs Brown carrying Zep rather than him walking. Since he was a puppy Zep has spent a large proportion of his time with members of the family rather than alone. Recently the Browns have moved to a new property, which necessitated Zep being placed in boarding kennels for two weeks, which is not a common occurrence for him.

Zep is the only dog in the household. His response to commands is inconsistent at best. The Browns do not use aversive methods to modify Zep's behaviour.

On average, Zep is exercised four times a day for 25 minutes. He does not have any pre-existing or current medical conditions.

*Barking:*

The Browns' primary concern was Zep's highly aroused barking, jumping, and attempts to get out the door, when one of the family is leaving the house. They described this behaviour as anxious in nature. Apparently he had been behaving in this manner for at least two years, and he is quite adept at predicting when someone is about to leave. He does not seem to like being by himself, and maintains contact with people if possible.

*Vocalising, scratching, and defecating overnight:*

Since moving to the new house, Zep had started to vocalise and scratch at the kitchen door during the night. He also defecated and urinated on the kitchen tiles

during his first week in the house, although this had reduced in frequency and was now only occasional. After exploring the differences in routine and layout between the two houses, it was apparent that there had been a major change in routine. Mr Brown had decided that the move to the new house should coincide with a new regime for Zep. In the Brown's previous house, Zep had free access to all its rooms, and slept in the Brown's bedroom. In the new house it was decided that he would stay overnight in the kitchen behind closed doors.

In an attempt to change Zep's vocalisation and scratching overnight, Mr Brown had been getting up on occasion to mildly reprimand Zep in the kitchen, after which he would place him on his dog bed. It seemed to Mr Brown that this had started to be effective.

*Exuberant behaviour with visitors:*
Another major concern for the Browns was Zep's behaviour when visitors arrived. He would jump, paw, bark, and mouth visitors. Over the years they had not been able to reduce this at all. He was less aroused when greeting members of the family, although he does become very aroused when the older daughter visits.

*Fear of trucks:*
Zep has been startled a number of times recently by passing trucks. On the last walk he jumped sideways into a hedge as a truck passed.

*Observed behaviour during the consultation:*
When I entered the Brown's home Zep immediately attempted to solicit attention from me. He was very aroused and jumped, pawed, and mouthed vigorously. Mrs Brown repeatedly attempted to stop Zep from jumping by using "no", "off" and various other verbal attempts at control. She also tried to stop him by holding his collar. Neither of these methods were effective. After half a minute of receiving no attention from me, he remained on the ground, but was still quite aroused. I used this opportunity to reward him with a rub and scratch.

Once we moved to the living room and sat down, he attempted to solicit attention with pawing, barking, and even climbing onto my shoulders, but I was able to demonstrate to Mrs Brown how it was possible to modify Zep's behaviour for the better by ignoring solicitous behaviour and taking the initiative to reward him for appropriate behaviour. During the consultation it was evident that Zep's attempts to obtain interaction from the Browns were almost always successful.

I asked Mrs Brown to leave the house as she normally would, so that I could observe Zep's behaviour. As soon as Mrs Brown moved towards the back door Zep rushed to the door and started barking. He placed himself where the door would open, and it seemed that his efforts were focussed more on preventing Mrs Brown from leaving than on attempting to get outside.

Mrs Brown explained that he does not behave in the same way prior to a walk. She responded to his behaviour by bending down and gently pushing him to the ground

as she spoke to him. When Mrs Brown moved outside and walked away, Zep became highly aroused, and repeatedly jumped one metre from the ground near the door while barking. I had asked Mrs Brown to remain out of sight until Zep stopped barking. Thirty seconds after she disappeared from sight, Zep stopped jumping and barking, and walked back towards me. He behaved in exactly the same manner when Edna left the house, and when I pretended to leave through the back door.

In the later stages of the consultation I demonstrated to the Browns how they could request basic behaviours from Zep before he received anything he valued. He was highly motivated to chase a rope toy, so I demonstrated how it was possible to withhold throwing the toy until he responded to a sit command given only once. At one point Zep took the toy to his bed and positioned himself over it in a threatening manner when I approached him. As I reached to take the toy he growled, but did not bite when I took the toy from his mouth. The Browns had not mentioned behaviour of this sort, but admitted that in such situations they would let him have his way as they "did not trust him". They reported that such aggressive behaviour was very infrequent; their reluctance to challenge him may have contributed to its rarity. The Browns had not seen this threatening behaviour as an issue, as they felt it was natural for a dog to be "possessive" in some circumstances.

In general Zep seemed to be of an impulsive, hyperactive temperament type (Lindsay, 2001). Various kinds of mild environmental and social changes quickly caused him to become sympathetically aroused. It seemed that his attempts to control these situations by modifying the behaviour of the Browns was effective in many instances.

## Assessment

The presenting behaviour problems are probably a result of Zep developing an expectation that he will succeed in controlling the behaviour of people. This has been influenced by his mild dependence on people to maintain emotional homeostasis, his hyperactive, impulsive temperament, and the history of compliant behaviour by the Browns towards him. The barking at the door is an attempt to control the departure of people; this is probably exacerbated by anticipation of failure and the resultant frustration. Vocalisation overnight is probably both a reflexive and instrumental act to reunite himself with the family, and is also influenced by frustration and anxiety.

## Initiating and Maintenance Factors

*Physiological influences:*

*Genetic predisposition:*

Thresholds for barking may be influenced by a dog's genetics (Askew, 2003). Terriers in particular seem to have low thresholds for barking (Overall, 1997). Hyperactivity and attention deficits seem to be more prevalent in hunting and working breeds (Lindsay, 2001). Therefore Zep's fox terrier genotype may be a factor when considering his barking and hyperactive temperament.

*Hormonal:*
Castration has been shown to reduce the likelihood of inter-male aggression in dogs (Hopkins *et al.,* 1976; Knol & Egberink-Alink, 1989), as well as aggression by dogs towards their owners (Neilson *et al.,* 1997). Due to the link between these types of aggression and competitive behaviour, the fact that Zep is entire may be a contributory factor for not only his overt aggression, but also any non-aggressive competitive behaviour.

*Veterinary considerations:*
The Brown's veterinarian did not indicate somatic causes for Zep's behaviour. In this case it was particularly important to rule out cognitive dysfunction and any of the myriad of medical conditions that could disrupt Zep's emotional homeostasis. It was also important to rule out a medical cause for his indoor toileting.

*Learning-mediated influences:*
*Early experience:*
The detrimental effects of limited early environmental and social experience on later behaviour of dogs have been well documented (Scott and Fuller, 1965; Melzak and Thompson, 1956; Pfaffenberger, *et al.*, 1962; Fox and Stelzner, 1967; Fisher, 1955; Hetts, *et al.*, 1992; Hubrecht, 1995; O'Farrel, 1992; Wright, 1983). It has also been clearly documented that intensive socialisation later in life often does little to remedy the maladjusted behaviour of an inadequately-socialised dog (Scott and Fuller, 1965, Fuller, 1964; Freedman, *et al.*, 1961). In rats it has been found that low levels of early environmental stimulation reduces adaptability to stressors in general (Levine, 1960; Levine *et al.*, 1967, Adler, 1970).

Zep spent the first 10 weeks of his life at a rural breeding facility. Once adopted by the Browns he was kept inside until 14 weeks of age. This relatively limited exposure to environmental and social stimuli during his sensitive period for socialisation may have reduced his general adaptability and tolerance to stressors. This may in turn have resulted in dependence on the Browns for emotional homeostasis – particularly considering the fact that he has spent very little time alone. His hyperactive nature may also have been influenced by early experience deficits, as restricted early socialisation has been linked with the development of hyperactive behaviour in terriers (Melzack and Scott, 1957).

*Environmental / Owner / Conditioning factors:*
The development of inappropriate aspects of Zep's behaviour has been influenced by his social interactions with the Brown family. The direct conditioning of undesirable behaviour, ambiguous information regarding what is appropriate, and the development of a learned expectation to succeed in controlling the behaviour of the Browns are significant maintenance factors in this case.

Separation from people seems to disrupt Zep's emotional homeostasis, but the anxiety induced by separation seems to be mild, and he is capable of returning to emotional homeostasis if alone. Zep's dependence on people was probably an initiating factor in his excessive attempts to control his social environment. Primarily

this has been through regular solicitous behaviour towards the family, and attempts to maintain his access to them. It has been proposed that such behaviour may be a mechanism used by needy dogs to obtain information about their role in the social environment (Overall, 1997). His impulsive, hyperactive character has probably exacerbated this behaviour (Lindsay, 2001). The extensive history of compliant, deferent behaviour Zep has experienced from the Brown family, and their lack of control over his behaviour, has resulted in him expecting to succeed in his manipulation of their behaviour. The development of this learned expectation to succeed in controlling social interactions may have increased the likelihood of him using aggression to retain resources of high value (Shepherd, 2002; Mertens, 2002), which in turn has been negatively reinforced by the Browns' withdrawal from such challenges.

Barking during departures: The barking at the door has probably been initiated and maintained by a number of factors related to this underlying issue. Anxiety may be elicited by the departure of attachment figures; this might in turn have resulted in attempts by Zep to prevent movement of people from the house by physically blocking the door and soliciting attention through barking and other behaviour. While this has been positively reinforced to some extent by the Browns handling and talking to Zep when he behaves in this way, a more significant maintenance factor may be the inherent frustration of this routine, where Zep ultimately fails to control their departure. The frustration of this failure is probably exacerbated by his expectation to succeed in controlling the behaviour of people in most other situations. His frustration would serve to intensify his functional efforts to control movement through the door and to obtain attention once people are outside (Lindsay, 2001), but may also introduce a displacement element to his behaviour. His expectation of success when manipulating the behaviour of the Browns may have generalised to all people, which might explain him behaving in the same manner with me when I left the house, and also his threatening behaviour towards me with the toy.

I did not consider Zep's behaviour at the door to be motivated primarily by separation anxiety, because he behaved in a similar manner whether or not there were other family members remaining in the kitchen, and also displayed the same behaviour when I left the house.

Overnight barking: The change in routine from Zep having constant access to all areas of the previous house, to being alone overnight has probably resulted in some anxiety, as well as frustration arising from his inability to resolve his separation from the family. His behaviour overnight is probably both a reflexive and instrumental act to reunite himself with the family, and is driven by the anxiety and frustration elicited by the situation (Lindsay, 2001). Mr Brown's attempts to stop Zep's vocalisations and scratching overnight probably have been counter-productive, as contact with Zep would have positively reinforced his inappropriate behaviour. The reduction in Zep's undesirable behaviour can be attributed to his habituation to isolation over time. This habituation would result in decreased anxiety and

frustration, which could reduce separation-induced and displacement vocalisations, and his motivation to solicit attention.

Indoor toileting: The toileting inside on the kitchen tiles might be due to a toileting substrate preference for hard surfaces, as the last house was fully carpeted and he toileted outside on smooth concrete. His time at the kennels prior to his introduction to the new home might have also re-established a habit of toileting on hard surfaces overnight near his bed site. This substrate preference may have developed prior to adoption at the breeding kennels as the period around 8 weeks is when such a preference develops (Scott & Fuller, 1965). The anxiety and frustration experienced by Zep due his isolation overnight is probably also a factor (Lindsay, 2001), and therefore the toileting may have decreased in frequency as a result of habituation to isolation.

Visitor interactions: Zep is highly social with people and has been extensively positively reinforced for solicitous behaviour towards people in the past. This, combined with his impulsive hyperactive temperament, has resulted in interactions with visitors that the Browns deem inappropriate.

## Treatment Plan

*Aims*

- To reduce the likelihood of aggressive behaviour by Zep
- To stop his barking when people depart the house
- To stop barking, scratching, and inappropriate toileting overnight
- To stop inappropriate behaviour when greeting visitors

### Method

The treatment programme focussed on modifying social aspects of Zep's environment that are contributing to his undesirable behaviour. Establishing consistent rules for interaction which aim to reduce Zep's success in controlling the behaviour of people, and to increase his compliance with requests from the family (particularly when resources of value are at stake), will comprise the core of the treatment programme. It is hoped that this approach will not only change his expectation of success in manipulating social interactions, but also provide appropriate behavioural outlets for Zep. The beneficial effects of these changes in relation to the presenting behaviour problems are multifaceted, and are outlined in greater detail below.

### Treatment Programme

*Client education.*

Before outlining a treatment plan for Zep, it was important to outline the initiating and maintenance factors to Mr and Mrs Brown. By increasing their understanding of why aspects of the programme would effect change, it was hoped their compliance with the programme would be increased. Client compliance is an important factor in treatment success (Marder, 1996; Polsky, 1994). One of the main reasons the Browns sought advice for Zep's behaviour was concern about his emotional state. By

explaining that Zep's behaviour was not motivated solely by anxiety, the subjective severity of the problem was reduced for them.

*Castration*

- *It was recommended that Zep be castrated. Zep had not been kept entire for any specific reason, so the Browns were happy to neuter him.*

A link has been established between "status-related" aggression and neuter status (Hopkins *et al.,* 1976; Knol & Egberink-Alink, 1989; Neilson *et al.,* 1997), therefore castration may help to reduce aggression and competitive behaviour.

*Management of aggression-inducing encounters*

- *The Browns were asked to continue to avoid situations that cause Zep to become aggressive.*

Direct confrontation of a dog displaying competitive aggression often results in an escalation of aggression in such a dog (Lindsay, 2004). As a result, owners often sensibly stop their confrontational behaviour. Success on the part of the dog in "winning" such challenges can confirm the efficacy of its aggressive response (Overall, 1997). Direct confrontation is also often inappropriate when the motivational state of many dogs that display aggression towards their owners is considered. Confrontation serves to increase the probability of future aggression in such dogs rather than suppress it (Lindsay, 2004).

- *The possibility of Zep biting either adults or children was discussed with the Browns. They were also asked to fit Zep with a muzzle if he was to interact with children, and to warn adults of the possibility of aggression from Zep. The main points of the Dangerous Dog Act 1991 were also discussed.*

It was important to emphasise to the Browns that Zep could potentially bite, and that the consequences of this could be significant (Mertens, 2002). By discussing the possibility and implications of an aggressive episode by Zep, the importance of employing safety measures with him was reinforced.

*Modification of social interactions*

- *The Browns should ignore all demanding and solicitous behaviour by Zep. They were warned of the likelihood of a short-term intensification of his demanding behaviour, and the importance of never responding to his demands. In conjunction with this, a "learn to earn" (LTE) programme was recommended, where Zep would be required to respond to a basic obedience command in order to receive any resource of value. A list of resources that Zep valued was developed with input from the Browns, to clarify the main areas of his life where the LTE programme would be used. Mr Brown was very keen on implementing this protocol, but Mrs Brown needed to be assured that her affectionate interactions with Zep did not need to stop, they just needed to be on her terms from now on. Once this was explained, she was happy to commit to a LTE programme.*

Interactions between Zep and the Brown family had been characterised by the Browns inadvertently deferring control of resources to Zep. Redefining the rules of this relationship was critical in order to change Zep's expectation of success when

attempting to control the family's behaviour, and any perception of high social status (Lindsay, 2001). The establishment of appropriate alternative behavioural strategies for Zep was also critical. This approach will have a number of beneficial effects:

1. Reduction in frustration in the long term. A short-term increase in frustration may occur during the early stages of the programme as Zep's predictions of interaction outcomes are disconfirmed (Lindsay, 2001). A potential consequence of this frustration is aggression (Panksepp, 1998; Mills, 2002; Reid, 1996), however the likelihood of this seemed to be low as Zep has only displayed aggression around toys and food he is in ownership of. Also during the consultation, attention, food and toys were withheld from Zep without any sign of threatening behaviour. The initial increase in frustration is also likely to result in an intensification of behaviours that have previously been successful. In order to maximise the Browns' compliance with my recommendation to ignore solicitous behaviour, it was important to warn them about this extinction spike in undesirable behaviour. Giving them an appropriate outlet to engage in affectionate interaction with their dog was also important as dog owners often find it difficult to ignore attention-seeking behaviour (Askew, 2003).

   Once Zep's predictions of social interactions have changed, and he expects to fail in his attempts to control the behaviour of people, his frustration as a result of this failure will be reduced. Providing an alternative and consistent rule structure which enables him to receive desired resources through appropriate behaviour will also ensure that frustration is minimised.

   Reducing the frequency and intensity of Zep's frustration will reduce the likelihood of undesirable behaviours linked with his frustration, such as barking, jumping and door scratching. A reduction in arousal due to frustration will also be beneficial to the Browns as they associate arousal with anxiety.

2. Reduction in aggression. Reversing Zep's expectation of successfully controlling the behaviour of people may reduce the likelihood that he utilises aggression as a technique to control resources he values (Shepherd, 2002; Mertens, 2002). Lowering his perceived status within the family is also thought to reduce the probability of a dog responding to perceived challenges with aggression (Askew, 2003; Landsberg *et al,* 2003) - although the concept of cognition of social status by dogs is under review.

3. Reduction in anxiety. A consistent rule structure is thought to increase the predictability of a dog's environment, thereby reducing anxiety (Wiepkema & Koolhaas, 1993). As anxiety seems to play a role in the etiology of Zep's problem behaviours, this may increase the success of the treatment programme.

In addition to the wide-ranging effects of changing Zep's social interaction expectancies, the LTE programme will result in an increase in desirable behaviour, and decrease in undesirable behaviour through operant conditioning. Extinction of undesirable behaviours and positive reinforcement of desirable behaviour will be the primary operant conditioning processes responsible for this change.

*Obedience training*

- *A reward-based obedience programme was outlined to the Browns. Mr and Mrs Brown were individually asked to use the training techniques I had demonstrated for the basic obedience commands, while I observed them, and made suggestions. The Browns felt that it would be reasonable to spend 5 to 10 minutes every second day practicing these commands.*

In addition to the obvious management advantages, improved owner control of dogs (through non-aversive training) establishes appropriate alternative behaviours that ultimately reduce frustration (Lindsay, 2001), increase the success of owners during competitive interactions, and reduce anxiety (Overall, 1997; Lindsay, 2001). As discussed above, these effects will aid in achieving the goals of the treatment programme. The efficacy of obedience training for reducing separation-related problems has also been well established (Goodloe & Borchelt, 1998; Jagoe & Serpell, 1996; Clark & Boyer, 1993; Borchelt & Voith, 1982).

*Behaviour modification protocols for specific situations*

- *I recommended that the Browns regularly and randomly carry out orchestrated departures. This involved preparing to leave in the usual way, actually leaving the house, moving out of sight from Zep, and waiting until he stopped jumping and became quiet before reappearing and re-entering the house. The Browns were asked to stop the departure routine and remain in the house if Zep stopped barking and became relatively relaxed at any stage of the departure. I demonstrated the routine to the Browns to ensure they understood the importance of returning to the door at a time that was contingent with quiet behaviour by Zep. Mr and Mrs Brown committed to at least three dummy departures a day, and were confident they could enlist the support of their two daughters.*

Significant initiating and maintenance factors for Zep's behaviour during departures are anxiety, frustration, and reinforcement of his inappropriate behaviour. Exposing Zep to many orchestrated departures, where separation from the person leaving is only short-term, will decrease the perceived aversiveness of departures, and therefore anxiety before and during departures. Due to the Browns' return being contingent on quiet relaxed behaviour by Zep, an alternative behavioural strategy will be established with Zep which increases the probability of them remaining in the house or returning. This will reduce frustration by increasing the controllability of the routine. Any perception of increased controllability may also reduce anxiety (Lindsay, 2004). Although quiet, appropriate behaviour by Zep will not be rewarded during real departures, this is not an issue when viewed from an operant conditioning perspective, as Zep will be under a variable schedule of positive reinforcement for quiet behaviour, and an extinction schedule for barking and jumping.

- *The Browns were asked to start isolating Zep from the family for short periods. It was recommended that he initially be kept behind a barrier that he could see them through, and only for short periods. The importance of only talking to him or letting him rejoin the family if he was quiet was emphasised. It was suggested that a food treat could be thrown to Zep if he was quiet for a period. The Browns were asked to gradually increase the duration of separation, and to start using the routine by using a household door rather than the see-through barrier.*

The aim of this technique was similar to the orchestrated leaving routine outlined above. It was recommended in conjunction with the leaving routine as it required less time and effort on the part of the Browns, but was still capable of habituating Zep to separation, and modifying his behaviour through extinction and positive reinforcement. The see-through barrier was recommended so that in the initial stages Zep's anxiety would be minimised, which would serve to increase the probability that he would relax quickly. The barrier would also allow the Browns to more accurately evaluate when Zep was behaving appropriately, and would give them the option to reward with food treats during separation.

- *Specific recommendations were made to modify Zep's attention-seeking jumping and barking. I recommended a basic rule of not speaking, handling, or looking at Zep while he was barking or jumping, while taking the initiative to reward Zep with attention or food treats when he had four feet on the ground and was quiet. The Browns were asked to explain this rule to anyone who wanted to interact with Zep. Consistency with the LTE programme was kept by recommending that one low-volume "sit" or "down" command could be given during times that Zep jumped up or barked, although it was explained that this was not necessary every time. It was recommended that Zep simply be shut in another room if it was not going to be practical to explain this rule to visitors, or if any jumping could not be tolerated. If a decision was made to shut Zep in another room during inappropriate behaviour, it was suggested that a consistent word such as "enough" be used at the same time as he was jumping on a visitor, followed as quickly as possible by him being escorted to another room and being left there until he stopped barking.*

When trying to reduce undesirable behaviour, extinction programmes are more effective if combined with positive reinforcement for alternate desirable behaviour (Mills, 2002), particularly when control can be exercised over the resource motivating an animal's behaviour. This avoids the pitfalls of positive punishment, which can often be ineffective and can inadvertently reward misbehaviour if not sufficiently aversive - or induce fear and anxiety if there is poor contingency between the behaviour and the aversive stimulus (Mills, 2002). Hyperactive impulsive dogs in particular are far less responsive to physical methods that attempt to restrain or inhibit their behaviour, but are very responsive to reward training (Lindsay, 2001). The time-out routine would serve to negatively punish jumping behaviour and speed his association between quiet behaviour and social access (Lindsay, 2001).

- *The footpath where Zep was exposed to trucks had a park next to it. It was recommended that he be walked in the park parallel to the road and at a distance where he was aware of the trucks, but not fearful. The Browns were asked to give him a top-tier food treat immediately after the passing of a truck.*

The move to the new house had introduced an innately threatening stimulus that Zep had not been exposed to in his previous walking locations. The location where he became fearful was quite discrete in nature – an area of footpath next to a busy main road with a higher speed limit. This enabled the development of a simple, minimally intrusive systematic desensitisation routine with counter-conditioning that was specific to the situation and fear-inducing stimulus. Systematic desensitisation and counter-conditioning techniques are widely recognised as being an effective method to reduce fear towards specific stimuli (Landsberg *et al,.* 2003; Overall, 1997; Lindsay, 2001; Askew, 2003; Nielson, 2002)**.**

*Recommendations for overnight*

- *It was recommended that Zep be left in the kitchen overnight without visits from anyone in the family.*

While Zep's behaviour overnight impinges somewhat on the Browns, they could tolerate the intermittent disruption and slight damage to the door. Because of this it was decided to persist with Mr Brown's desire to keep Zep away from the bedrooms overnight. It seemed from the Browns' description of Zep's behaviour overnight that he had habituated somewhat to isolation. I therefore felt that by maintaining a consistent routine and ensuring that he was not rewarded by social contact for barking or scratching, that his anxiety and frustration would diminish over time, as would the overt behaviours that were of concern to the Browns.

- *The Browns were asked to utilise food-based environmental enrichment techniques overnight. The use of a puzzle ball, filled Kong, and hidden food treats was suggested. It was suggested that any food used overnight needed to come from his daily food allowance.*

Providing Zep with access to food during his separation from the family provides an innately pleasurable stimulus that promotes parasympathetic arousal which is antagonistic to anxiety (Lindsay, 2001). It was important that any food used for environmental enrichment came from his daily allowance; this would ensure that he was motivated to engage in the environmental enrichment and also that his calorific intake remained appropriate. One concern with this recommendation is that ingestion of food increases colonic motility which could increase the likelihood of Zep defecating overnight (Berne & Levy, 1996). The Browns were warned of this possibility and asked to stop or reduce his food intake overnight if his indoor defecating increased in frequency.

*Diet*

- *The Browns were advised that a low-protein diet (less than 18% protein), may help to decrease anxiety and improve learning potential with Zep. A plate of pasta three hours after his morning meal was also suggested but this would have been slightly inconvenient for the Browns so it was decided to not bother*

*with this. Changing Zep's main food was not an inconvenience for the Browns, so it was decided to implement a low-protein diet.*

If Zep's serotonin levels could be raised, any anxiety he experiences when separated from people may be reduced. This may aid the other elements of the treatment programme. Serotonin, a known anxiolytic, is synthesised in the brain by the hydroxylation of the essential amino acid tryptophan. Due to the poor affinity of the enzyme that catalyses this reaction for tryptophan, the synthesis of serotonin can be increased by increasing brain tryptophan levels. Tryptophan and other large neutral amino acids (LNAA) are transported with equal efficiency by the blood-brain barrier transportation molecule, which means that plasma tryptophan must compete with other LNAA for transport sites (Pardridge, 1977).

Because proteins are often low in tryptophan and high in LNAA, a high-protein meal will reduce the proportion of plasma tryptophan to LNAA, retarding the transport of tryptophan across the blood-brain barrier. In contrast, low-protein diets increase the ratio of tryptophan to LNAA, resulting in a greater transfer of tryptophan to the brain. An additional way in which low-protein diets increase brain tryptophan levels is linked to the fact that such diets are often richer in carbohydrates. A carbohydrate-rich meal causes an increase in the secretion of insulin, which significantly lowers plasma LNAA levels (mostly by causing them to be transferred to skeletal muscle), while having little effect on tryptophan (Fernstrom *et al.*, 1979). It has been shown that low-protein, high-carbohydrate meals raise tryptophan levels in the brain (Fernstrom & Wurtman, 1971), while high-protein meals can inhibit serotonin synthesis (Fernstrom & Wurtman, 1972). Strong (1999) recommends feeding carbohydrate three hours after the initial consumption to maximise tryptophan transfer across the blood/brain barrier.

Aspects Considered, But Not Implemented

*Pheromones*

- *The use of dog appeasement pheromone (DAP) as an adjunct to the behaviour modification program was raised with the Browns, however due to financial considerations they decided to implement the programme without the use of a home diffuser to assess their progress before considering the use of DAP.*

The mammary appeasine DAP is thought to reduce the perceived aversiveness of an environment (Mills, 2005). Research on its efficacy is limited, but it has been shown to raise thresholds for fear in dogs (Shepherd & Mills, 2003). Anything that reduces the potential for anxiety in Zep and promotes relaxation may have been useful as an adjunct to the treatment programme.

*Restriction of Zep's movement overnight*

- *Restricting Zep's movement to a small area overnight was discussed as a method to reduce any indoor toileting. The Browns felt that due to the decrease in toileting incidents since they first moved to the house, and the potential efficacy of my other recommendations in helping Zep adjust to separation, they would like to see how things went before they tried this.*

Dogs are often reluctant to eliminate near established resting sites (Ross, 1950). This can be used to manage inappropriate toileting as long as the time between elimination opportunities is not too great (Overall, 1997).

Administration

At the conclusion of the consultation the Browns were given a hand-written sheet with the main points we had discussed. This ensured that they had a written summary of the proposed treatment programme for the period between the consultation and the arrival of the full treatment protocol notes.

Full notes were emailed to the Browns the next day. The notes were personalised for the case in an effort to increase the relevance of the notes, and therefore client compliance (Egan, 1994). While it is important to provide sufficient detail so that recommendations are carried out appropriately (Askew, 2003), it is also important that the main points of the treatment programme are not lost in the detail. For this reason the notes were structured with a concise "stick-on-the-fridge" page including the diagnosis and main treatment elements, which was then followed by a "details" section with more precise recommendations.

The Browns were asked to contact me two weeks after the consultation to outline any improvements or setbacks, and to provide an opportunity for them to discuss any issues or questions that had arisen. This provided a planned platform for discussion as well as a deadline situation, which may encourage clients to begin immediate implementation of the treatment programme (Askew, 2003).

## Follow Up

*Three weeks:*

Mr Brown called me three weeks after the consultation. He was very encouraged about the apparent "sea-change" that had occurred in the family's relationship with Zep. Apart from concerted and innovative efforts to solicit attention in the first few days, Zep had been very responsive to the LTE and obedience programmes, and Mr Brown felt that Zep was now more relaxed in general. The family had focussed more on the separation routine inside the house, as they found it more convenient than the mock departure routine. While Zep would bark when put behind the barrier, this had decreased in frequency, and he had seemed to "click" that a quiet sit was linked with a food treat or the opening of the barrier. His barking was more persistent when they had started the routine behind a closed door that week, but he was getting better in this situation as well.

His jumping up and barking for attention had very quickly changed with the new interaction rules, and this had generalised to visitors (apart from one plumber that had encouraged Zep to jump up). He still barked when people left the back door, but the duration of this had started to decrease. Mr Brown volunteered that they needed to work more on the mock departures. Zep's vocalising and scratching had now stopped overnight, apart from the ten minutes before they normally got up. He had not toileted inside for the past fortnight.

Mr Brown had been spending time with Zep and his rope toy, and had been succeeding with a "drop" command in return for a food treat, which was a non-confrontational technique I had briefly demonstrated for the toy. While Zep was somewhat "begrudging" when he was asked to drop the toy, he had not growled at Mr Brown since the implementation of the "drop" training. Zep had also become very responsive to the "sit", "down" and "stay" commands before the toy was thrown.

Zep had not yet been castrated, but was booked for the following week.

I congratulated Mr Brown on the effort he and his wife had put in, and the positive changes that had resulted from their work. I then suggested that they take care not to open the door to the kitchen in the morning if Zep was vocalising or scratching. I also encouraged Mr Brown's suggestion that they needed to set aside more time for the mock departures. I asked Mr Brown to call if he had any further questions, or if they were not continuing to make progress.

*Three months:*
I called Mr Brown three months after the initial consultation. Zep still seemed to be aware of when people were leaving, and would occasionally bark for a very short duration, but this had almost entirely stopped. The Browns had stopped the mock departure routine due to this improvement. If given the choice Zep still preferred to be in the company of people rather than alone, but he could be separated from the family during the day and overnight with only the occasional bark or two. Mr Brown reported that both the family and Zep were much happier with the new relationship that had developed. No aggressive behaviour had been shown by Zep since our last conversation. He had stopped eliminating inside.

I recommended that the treatment programme be continued for the rest of Zep's life.

## Evaluation

The aims of the programme were almost entirely achieved.

The value of explaining the role that frustration played in Zep's behaviour was apparent when discussing the family's implementation of the programme at follow-up, as it helped alleviate Mrs Brown's concerns that Zep would suffer if left alone. Preparing the family for the inevitable extinction bursts had also proved important.

Mr Brown seemed to be particularly responsive to the status-reducing rationale of the programme during the consultation, so I emphasised it to a greater extent than may have been truly representative of the etiology of Zep's presenting behaviour problems. The advancement of what may be considered a fundamental attributional error (Ross & Nisbett, 1991) may be justified as it provided the Browns with a simple underlying conceptual framework for the programme which seemed to

increase their resolve to comply with recommendations that did address the broad etiology of Zep's behaviour problems. The Brown's compliance with treatment recommendations, and the overall success of treatment, highlights the importance of identifying counselling approaches that increase the probability of client compliance (Dehasse, 2002).

## References


Adler R. (1970) The effects of early experience on the adrenocortical response to different magnitudes of stimulation. *Physiology and Behavior,* **5**(8): 837-839.

Askew HR. (2003) *Treatment of behaviour problems in dogs and cats (2nd Ed).* Blackwell Science, Oxford.

Berne RM and Levy MN. (1996) *Principals of Physiology,* 2nd Ed. CV Mosby, St Louis.

Borchelt PL and Voith VL. (1982) Diagnosis and treatment of separation-related behaviour problems in dogs. *Veterinary Clinics of North America: Small Animal Practice,* **12:** 625-635.

Clark GI and Boyer WN. (1993) The effects of dog obedience training and behavioural counselling upon the human-canine relationship. *Applied Animal Behaviour Science,* **37:** 147-159.

Danneman PJ and Chodrow RE. (1982) History taking and interviewing techniques. *Veterinary Clinics of North America: Small Animal Practice,* **12**(4): 587-592.

Dehasse J. (2002) The role of the family in behavioural therapy. In: Horwitz DF, Mills DS, and Heath S. (2002) *BSAVA Manual of Canine and Feline Behavioural Medicine.* BSAVA, Glouchester.

Egan G. (1994) *The Skilled Helper* 5th Edition. Brooks/Cole, CA.

Evans RK. (1993) Canine behaviour disorders. *Veterinary Technician,* **14**(9): 535-540.

Fernstrom JD and Wurtman RJ. (1971) Brain serotonin content: Increase following ingestion of carbohydrate diet. *Science,* **174**: 1023-1025

Fernstrom JD and Wurtman RJ. (1972) Brain serotonin content: Physiological regulation by plasma neutral amino acids. *Science,* **178**: 414-416

Fernstrom JD, Wurtman RJ, Hammarstrom-Wiklund B, Rand WM, Munro HN, and Davidson CS. (1979) Diurnal variations in plasma concentrations of tryptophan, tyrosine, and other neutral amino acids: effect of dietary protein intake. *American Journal of Clinical Nutrition,* **32**: 1912-1922.

Fisher AE. (1955) thesis, Pennsylvania State Univ. Cited in Scott J. (1962) Critical periods in behavioural development. *Science,* **138**: 949-958.

Fox MW and Stelzner D. (1967) The effects of early experience on the development of inter and intraspecific social relationships in the dog. *Animal Behaviour,* **15**: 377-386.

Freedman D, King JA, and Elliot O. (1961) Critical periods in the social development of dogs. *Science,* **133**: 1016-1017.

Fuller JL. (1964) Effects of experimental deprivation upon behaviour in animals. *Proceedings World Congress of Psychiatry (Montreal),* **3**: 223-227. Cited in: Markwell PJ and Thorne CJ. (1987) Early behavioural development of dogs. *Can Pract,* 12: 32-34.

Goodloe LP and Borchelt PL. (1998) Companion dog temperament traits. *Journal of Applied Animal Welfare,* **1:** 303-338.

Hetts S, Clark JD, Calpin JP, et al. (1992) Influence of housing conditions on beagle behaviour. *Applied Animal Behaviour Science,* **34**: 137-155.

Hopkins SG, Schubert BS, and Hart BL. (1976) Castration of adult male dogs: effects on roaming, aggression, urine marking, and mounting. *Journal of the American Veterinary Medical Association,* **168**(12): 1108-1110.

Horwitz DF, Mills DS, and Heath S. (2002) *BSAVA Manual of Canine and Feline Behavioural Medicine.* BSAVA, Glouchester.

Hubrecht RC. (1995) Enrichment in puppyhood and its effects on later behaviour in dogs. *Laboratory Animal Science,* **45**: 70-75.

Jagoe JA and Serpell JA. (1996) Owner characteristics and interactions and the prevalence of canine behaviour problems. *Applied Animal Behaviour Science,* **47:** 31-42.

Knol BW and Egberink-Alink ST. (1989) Treatment of problem behaviour in dogs and cats by castration and progestagen administration: a review. *Veterinary Quarterly,***11**(2): 102-7.

Landsberg G, Hunthausen W, and Ackerman L. (2003) *Handbook of Behaviour Problems of the Dog and Cat.* Butterworth Heinmann, Oxford.

Levine S. (1960). Stimulation in infancy. *Scientific American,* **202**: 80-86.

Levine S, Haltmeyer GC, Karas GC, and Denenberg VH. (1967) Physiological and behavioural effects of infantile stimulation. *Physiology Behaviour,* **2**: 55-59.

Lindsay SR. (2000) *Handbook of Applied Dog Behaviour and Training: Adaption and Learning.* Iowa State University Press, Iowa.

Lindsay SR. (2001) *Handbook of Applied Dog Behaviour and Training: Etiology and Assessment of Behaviour Problems.* Iowa State University Press, Iowa.

Lindsay SR. (2004) *Handbook of Applied Dog Behaviour and Training: Protocols and Procedures.* Iowa State University Press, Iowa.

Marder A and Reid JP. (1996) Canine behaviour problems: behaviour modification, obedience, and agility training. *Compendium on Continuing Education for the Practicing Veterinarian,* **18**(9): 975-1018.

Mason GJ. (1991) Stereotypies and suffering. *Behavioural Processes* 25, 103-115.

Melzack R and Scott TH. (1957) The effects of early experience on the response to pain. *Journal of Comparative Physiology Psychology,* **50**: 155-161.

Melzak R and Thompson WR. (1956) Effects of early experience on social behaviour. *Canadian Journal of Psychology,* **10**: 82-90.

Mertens PA. (2002) Canine Aggression. In: Horwitz DF, Mills DS, and Heath S. (2002) *BSAVA Manual of Canine and Feline Behavioural Medicine.* BSAVA, Glouchester.

Mills, DS. (2002) In: Horwitz DF, Mills DS, and Heath S. (2002) *BSAVA Manual of Canine and Feline Behavioural Medicine.* BSAVA, Glouchester.

Mills D. (2005) Pheromonatherapy: theory and applications. *In Practice,* **27:** 368-373.
Panksepp J. (1998) *Affective Neuroscience: The Foundations of Human and Animal Emotions.* Oxford University Press, New York.

Nielson JC. (2002) Fear of places or things. In: Horwitz DF, Mills DS, and Heath S. (2002) *BSAVA Manual of Canine and Feline Behavioural Medicine.* BSAVA, Glouchester.

Neilson JC, Eckstein RA and Hart BL. (1997) Effects of castration on problem behaviours in problem dogs with reference to age and duration of the behaviour. *Journal of the American Veterinary Medical Association,* **211:** 180-182.

O'Farrel V. (1992) *Manual of Canine Behaviour.* Cheltenham, England, British Small Animal Veterinary Association.

Overall KL. (1997) *Clinical Behavioural Medicine for Small Animals.* Mosby, St Louis.

Pardridge WM. (1977) In: Wurtman RJ and Wurtman JJ (Eds) *Nutrition and the Brain,* Vol 1, 141-204. Raven Press, NY.

Pfaffenberger CJ, Scott JP, and Fuller JL, et al. (1962) *Guide dogs for the blind: Their selection, development and training.* Elsevier Scientific Publishing Company, Amsterdam.

Polsky RH. (1994) The steps in solving behavior problems. *Veterinary Medicine*, **89**(6): 504, 506-507.

Reid P. (1996) *Excel-erated Learning.* James and Kenneth.

Ross L and Nisbett RE. (1991) *The Person and the Situation: Perspective of Social Psychology,* Temple University Press, Philadelphia.

Ross S. (1950) Some observations on the lair dwelling behaviour of dogs. *Behaviour,* **2:** 144-162.

Scott J and Fuller JL. (1965) *Genetics and the Social Behaviour of the Dog.* University of Chicago Press, Chicago.

Shepherd K (2002) Development of behaviour, social behaviour and communication in dogs. In: Horwitz DF, Mills DS, and Heath S. (2002) *BSAVA Manual of Canine and Feline Behavioural Medicine.* BSAVA, Glouchester.

Shepherd G. and Mills DS. (2003) Evaluation of dog-appeasing pheromone as a potential treatment for dogs fearful of fireworks. *Veterinary Record,* **152**(14): 432-436.

Strong V. (1999) *The Dog's Dinner.* Ed S. Whitehead. Alpha, Windsor.

Wiepkema PR and Koolhaas JM. (1993) Stress and animal welfare. *Animal Welfare,* **2:** 195-218.

Wright JC. (1983) The effects of differential rearing on exploratory behaviour in puppies. *Applied Animal Ethology,* **10**: 27-34.