

The development of a valid and reliable test of amicability in dogs

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Introduction

Dogs are extremely popular pets, with nearly 40% of Australian (Headey, 2006) households owning a dog. Dogs are obtained mostly as companion animals (Bennett, Cooper, Rohlf, & Mornement, 2007) and it has been documented that dog ownership is associated with many benefits. For example, people who live with dogs are at lower risk of cardio vascular disease and depression, petting your dog lowers stress, and dogs facilitate social contact (Anderson, Reid, & Jennings, 1992; Patronek & Glickman, 1993). However, dog ownership is not without its problems. Dogs and their owners are likely to face issues associated with the impact of various factors, such as urban consolidation, busier lifestyles and government legislation restricting pet ownership.

These factors have the potential to negatively influence the behaviour of both dog and owner. When dogs exhibit behaviour that is unacceptable to their owners, the relationship between dog and owner can break down (Serpell, 1996). This can cause significant distress to owners and result in dogs being surrendered to pounds or shelters, where their problematic behaviour often gets worse (Hewson, Hiby, & Bradshaw, 2007) and where about 30% will be euthanased (Marston, Bennett, & Coleman, 2004). In addition, the general community needs to be protected from dogs that cause disruption or injury to people and/or other animals. Suffering associated with dog-bite injuries is significant, with over 482 hospital admissions annually in Victoria alone (Cassell & Ashby, 2009).

Currently, there are no reliable objective tests whereby individual dogs are assessed to determine their level of dangerousness. According to the Domestic (Feral and Nuisance) Animals Act 1994, Section 34A, a dog is a dangerous dog if: a) the dog is kept as a guard dog for the purpose of guarding non-residential premises; or b) the dog has been trained to attack or bite any person or any thing when attached to or worn by a person. The council can also declare a dog dangerous: a) if the dog has caused the death of or serious injury to a person or animal by biting or attacking that person or animal; or b) if the dog is a menacing dog and its owner has received at least 2 infringement notices in respect of the offence regarding the restraint of menacing dogs; or c) if the dog has been declared a dangerous dog under a law of another State or Territory; or d) for any other reason prescribed.

The lack of clarity in some of these categories means that, currently, it is possible that safe family pet dogs may be incorrectly declared dangerous, forcing their owners to adhere to strict confinement and management guidelines. This alone could negatively impact on the welfare of the dog and the relationship it has with its human companions. Furthermore, it is of concern that current legislation can

declare a dog to be a risk to the public based purely on its breed type or appearance and without it undergoing any form of behavioural or temperament assessment.

For example, American Pit Bull Terriers are a restricted breed in Australia. As a result, all existing individuals are required to be muzzled when in public, confined appropriately and de-sexed, with the aim being to eventually eradicate the breed. However, the restriction of the American Pit Bull Terrier has not been adequately justified by authorities (Collier, 2006). Available evidence does not support the view that the Pit Bull Terrier is a uniquely dangerous breed. Indeed, a German study found no indication of dangerousness in specific breeds (Schalke, Ott, von Gaertner, Hackbarth, & Mittmann, 2008) and a study conducted in the USA, which examined breed differences in canine aggression, found that breeds such as Chihuahuas and Dachshunds obtained higher average scores of aggression toward humans and dogs than other breeds (Duffy, Hsu, & Serpell, 2008).

It is critical that dogs and humans live together harmoniously. Incorrectly labelling certain dog breeds as more dangerous than others is not an accurate method for protecting members of our community, nor does it help promote a positive relationship between humans and dogs. A different approach is required which is more objective and reliable. In conjunction with community education on dog behaviour, a scientifically designed canine behaviour assessment would be of great benefit. Rather than restricting certain breeds or breed types based on the assumption that they are more likely to endanger the public, it is necessary to develop regulatory strategies which effectively promote and maintain the benefits of dog ownership while protecting the welfare of dogs and the general public.

Another reason to develop behavioural tests for dogs is to assist breeders in making sensible breeding choices. As behaviour is, in part, controlled by genetics, it would be beneficial to encourage dog breeders to select and breed dogs which possess suitable temperaments well suited to living in today's society. Currently few behavioural assessments provide reliable information about a dogs' underlying temperament. Although many dog breeders currently strive to produce perfect companion dogs, there are no standards against which dogs can be judged for their suitability as pets. Often the criteria dog breeders adhere to are based on specific breed standards that relate to historic functionality and are not necessarily relevant to today's urban dog owner (McGreevy, 2007).

To move forward, therefore, requires organisations to work together to identify dogs not only that are dangerous but also those that possess personalities which enable them to be suitable pets. One way of achieving this would be to use a behaviour assessment that has been scientifically

developed based on objective measures that are both reliable and valid. An easy to administer, accurate, canine behaviour assessment would be an invaluable tool for a range of dog related organisations. Councils, breeders, shelters, and trainers could utilise the assessment to assist in making decisions based on the behaviour of individual dogs.

Requirements to develop a valid and reliable canine behaviour assessment

Measuring any form of animal behaviour involves adhering to specific guidelines. The way in which behaviour is quantified varies and can include measurements of latencies, frequencies, durations and intensities.

Whichever approach is taken to measure behaviour, it is essential that collection of the information is conducted in an accurate and reliable manner (Martin & Bateson, 2007). Many researchers require measurements that can predict or determine how an individual will behave in the future. For example, working dog organisations need to determine which individuals will be best suited to particular specialised roles. Therefore, behavioural measures are taken which aim to measure a dog's aptitude at specific tasks (Wilsso & Sundgren, 1997). This is designed to predict a dog's future performance, so as to not waste time and money training inappropriate dogs.

To assess how well the chosen behaviours have been measured it is necessary to test for reliability and validity. Reliability refers to how repeatable and consistent the measure is while validity concerns the extent to which the measurement actually measures the desired behaviour in question and how it can predict behaviour in the outside world (Martin & Bateson, 2007). The complexity of dog behaviour makes the development of accurate ways to measure behaviour difficult. Currently, a number of different approaches are employed to study canine behaviour. These include; owner-directed questionnaires, expert ratings of breeds, standardised assessments and observational studies (Spady & Ostrander, 2008). The most commonly used method to measure behaviour is the standardised assessment.

In an attempt to identify dog temperament or personality traits, researchers interested in dog behaviour have developed a range of behavioural assessments involving series of subtests which measure a variety of behaviours. Unfortunately, many dog behaviour assessments have not been developed correctly using a systematic scientific approach. It is therefore questionable whether they provide reliable and valid measures (Taylor & Mills, 2006). Many measure large numbers of behavioural variables often relying on subjective assessments. To ensure dog behaviour is measured correctly and accurately it is worthwhile to select a single behavioural element and devise a quantitative assessment whereby its reliability and validity can be fully tested and reported. By undertaking the correct approach when developing a behavioural assessment, it is expected that any problems encountered relating to the assessment's reliability, validity or feasibility can be resolved.

When developing an assessment, first it is necessary to define the concept that needs to be measured. Following this, appropriate ways to measure the desired behaviour can be devised. Testing conditions should be standardised as much as possible to ensure that the only variables that alter during the assessment of a dog's behaviour are related to the dog or owner. Therefore, factors such as equipment, testers, participants, time of testing etc should remain the same throughout the assessment process. In the case of dog behaviour assessments, it is important to determine how an owner's presence influences a dog's behaviour as they are with the dog in the general community most of the time and therefore a necessary part of the experimental procedure.

Defining which dog behaviours should be assessed?

In ensuring responsible pet ownership and minimising public pet nuisance, animal management officers are responsible for seizing stray dogs and identifying dogs which are dangerous. Incorrect judgements issued by animal management officers may also affect the council's level of credibility in view of the public. In contrast, dogs which pose a serious threat to the public may not be identified using the current assessment criteria. The consequence would be dangerous dogs with no restrictions being allowed in the community. These problems exist primarily due to the nature and complexity of dog behaviour. The behaviour a dog exhibits in one environment may or may not relate to how it behaves in another. Frequently, dogs who cause serious injury or even fatalities are described by their owners as having never previously exhibited dangerous behaviour. Although these reports are often questionable, it means that many potentially dangerous dogs may exist in our community, their owners oblivious to their potential to cause harm.

So what behaviours are important when attempting to identify a dangerous dog? A number of behavioural assessments have been developed around the world with the aim to identify aggressive dogs. These are based on the assumption, questioned by many experts, that most dog bites reflect aggression rather than fear, frustration or an activated prey drive. Currently, only one test has been scientifically validated to measure aggressive behaviour in dogs (Netto & Planta, 1997). This assessment is not commonly utilised, possibly because it is too time consuming and requires a range of equipment. Furthermore, if not conducted correctly, the assessors and handlers involved may be at risk of injury as the dogs are handled extensively, or the dog may be at risk of developing unwanted behaviours due to the threatening nature of the test. Worryingly, many dog behaviour assessments, despite having not been validated, are used in a legal context to determine which dogs are safe in the community. Three assessments from Europe were evaluated in a recent study (Bräm, Doherr, Lehmann, Mills, & Steiger, 2008). The researchers found that even though the three tests shared the same aim of identifying potentially dangerous dogs, there were inconsistencies in the results between the tests. This indicates the need for a well designed assessment that is safe and easy to administer and which yields accurate information about a dog's temperament.

Given the established difficulty of identifying dangerous dogs, perhaps an alternative approach is required. Rather than focusing on aggressive behaviours, perhaps we should be assessing for dogs which exhibit desirable behaviours. For example, a dog which exhibits non-aggressive behaviour in a range of different situations may be labelled as friendly, non-aggressive or even sociable. It would be safe to assume that a dog who rates highly on friendliness to people and other animals in a valid and reliable assessment is less likely to be dangerous. However, it may be much easier to persuade owners to have their dogs tested if the assessment is perceived as focusing on positive traits rather than negative ones. The work councils undertake in relation to animal management is often viewed negatively by some members of the Australian public. For example, the seizing of stray dogs, restricting off-lead exercise areas for dogs as well as incorrectly identifying dangerous dogs can impact negatively on the image the council is attempting to promote. Undeniably, these issues are important and need to be addressed adequately. However, instead of councils focusing primarily on identifying and managing dangerous dogs it may also be worthwhile to provide a service whereby pet dog owners can have their adult dog's behaviour assessed using a scientifically designed valid and reliable behaviour assessment which accurately measures desirable personality traits. Owners could be rewarded for this behaviour via provision of cheaper registration rates or access to restricted resources such as off-lead parks.

A recent study identified a range of characteristics considered important to the Australian public in their "ideal dog" by surveying 877 participants (79.8% female) aged 18 to 82 years (mean = 34.3, SD = 14.5). A number of behavioural characteristics were identified as important; these included dogs being safe with children, fully housetrained, friendly and obedient. Participants also wanted their ideal dog to come when called, not to escape from their property, to enjoy being petted and to display affection to their owners (King, Marston, & Bennett, 2009). The behavioural characteristics that appeared to be most important based on the results from the questionnaire were behaviours related to the canine personality trait of amicability. Dogs which exhibit affectionate, friendly and calm behaviours seem to be preferred by the Australian public. This is supported by literature which finds that commonly reported behavioural reasons for relinquishing dogs include hyperactivity, destructiveness and aggression (Marston et al., 2004); behaviours people find problematic in a pet dog. Based on this information it would be beneficial to design a behaviour assessment aimed at measuring behaviours related to this trait.

Defining amicability: What is it?

A recent study investigating dog personality resulted in the development of a questionnaire (MCPQ-R) which asked owners to rate their dog on a series of attributes (Ley, Bennett, & Coleman, 2009). Five dimensions of canine personality emerged from the study; these were labelled extraversion, motivation, training focus, amicability and neuroticism. The dimension labelled 'amicability' consisted of five attributes; easy going, friendly, non-aggressive,

relaxed and sociable. These attributes corresponded with the results obtained from the questionnaire in which people indicated that a dog which possessed these types of behavioural characteristics was rated as 'ideal'. These findings were used to assist the development of an assessment which is expected to measure amicability. To determine what exactly constitutes these traits in dogs and how they might be measured, advice was sought from a steering committee consisting of experts in dog related disciplines in addition to using available data on existing dog behaviour assessments.

Monash Canine Amicability Assessment (MCAA)

The Monash Canine Amicability Assessment (MCAA) protocol was developed in conjunction with a panel of experts consisting of dog trainers, veterinarians, dog breeders and scientists all involved with dog behaviour. The MCAA involves measuring a dog's behaviour in response to being exposed to a choreographed series of events involving meeting an unknown person. The assessment procedure is video recorded and consists of sub-tests where the dog is both on and off lead and where the owner is present and absent. A person who is unknown to the dog is present throughout. The test duration is approximately 10 minutes. A range of variables are measured during the assessment, such as latency to approach and time spent near the stranger, as well as frequencies of behaviours exhibited by the dog, such as postures, vocalisations etc.

Evaluating reliability and validity of the MCAA

To ensure the MCAA measures the intended behavioural attributes, it is essential to evaluate the assessment's validity and reliability. Dog owners will be invited to complete a number of validated questionnaires. These are the Monash Canine Personality Questionnaire (MCPQ-R) (Ley et al., 2009), Monash Dog Owner Relationship Scale (MDORS) (Dwyer, Bennett, & Coleman, 2006) and Canine Behaviour Assessment and Research Questionnaire (CBARQ) (Hsu & Serpell, 2003). These questionnaires will provide further information on the dog's behaviour, the relationship between dog and owner as well as dog and owner demographics. Statistical analyses will be used to determine which variables best predict amicability and relationships between variables measured in the assessment and results obtained from the owner-directed questionnaires.

Data will be gathered by recruiting pet dog owners, aged 18 years or older and their dogs from the community. The dogs will be aged at least 18 months old. The assessment will be conducted in a standardised assessment area. Testing will continue until 100 adult pet dogs are assessed using the assessment and their owners have completed the questionnaires.

To test the **reliability** of the assessment the following protocol will be used:

- **Intra-observer reliability:** The same person shall score the same 20 randomly selected dogs during the same assessment on two occasions, using the video recording of the session. The order of presentation will be randomised and four weeks will separate scoring sessions. Correlational analyses will compare the scores obtained from the two occasions.
- **Inter-observer reliability:** Two observers who possess a sound knowledge of dog behaviour will score the behaviour of 20 randomly selected dogs using video recordings. Correlational analyses will examine the relationship between the scores obtained on the range of behavioural variables for each observer.
- **Test-retest reliability:** A random sample of 20 dogs which have previously been assessed will be re-tested one month after initial testing and correlational analyses will be conducted on both sets of behavioural variables measured.

To test the **validity** of the assessment the following will be conducted:

- Behavioural responses from the sample of 100 dogs will be compared to the owners' responses on the behavioural components of the completed questionnaires. The construct validity of the assessment would be supported by strong correlations with measures of amicability reported by the owner and weak correlations with unrelated traits such as hunting related behaviours.
- It is important to determine which variables are measuring amicability. There may be variables measuring unrelated behaviour such as activity. A Principal Components Analysis (PCA) will be conducted on the data and will identify common groupings of variables and produce a number of components; these could be used to identify which variables are most likely measuring amicability. These measures would then be included in the final assessment protocol.
- Video recorded footage of a random sample of previously assessed dogs will be viewed by a number of dog behaviour experts. The experts will be asked to rate the amicability of each individual dog on a scale. Correlational analyses will be conducted to examine the relationship between the expert ratings and the behavioural variables obtained by the dog during the assessment. A valid measure of amicability would indicate that dogs who obtained high scores of amicability during the assessment would also be rated as highly amicable by a number of dog behaviour experts.
- If time permits, a sample of 20 puppies (6 months old) will be evaluated using the assessment. The same individuals will be tested again at 12 months of age. Paired sample t-tests to compare results obtained at Test 1 and Test 2 will be used to determine if age affects test scores in a systematic way. Correlational analyses will be used to explore associations between Test 1 and Test 2, to establish which measures, if any, demonstrate predictive validity.

If the assessment is found to be a reliable and valid measure of amicability, the assessment will be of benefit to a range of dog related organisations and people involved with dogs who want to assess the amicability of pet dogs. Therefore, it is essential that it can be conducted easily, with minimal fuss and without risk of error or injury to those involved. The potential broader application of the assessment is important.

Conclusions

Further evaluation of the Monash Canine Amicability Assessment is required before any conclusions can be drawn on the test's capabilities. Further assessment of a range of dogs is needed to gain adequate data. An objective assessment such as the MCAA has the potential to be of great benefit to councils, dog welfare shelter organisations, breed clubs, dog breeders as well as pet dog owners in Australia. Councils could utilise the assessment to identify amicable (ie friendly, sociable) and therefore, also non-amicable (ie, potentially aggressive) dogs. Shelters could utilise the assessment to assist in identifying dogs with suitable temperaments for re-homing while dog breeders could be encouraged to identify and breed dogs which possess amicable temperaments. Breeding dogs which possess temperaments appropriate for living in today's society would enhance the human-canine relationship. It could be expected that in conjunction with owner education on dog behaviour and training, fewer dogs would exhibit problematic behaviours, therefore resulting in less nuisance dogs in the community and a lower risk of dog attacks to members of the general public. It would also be expected that fewer dogs would be admitted to and euthanised in shelters, hence improving dog welfare.

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Tammie King completed a BSc (Hons) majoring in Zoology at The University of Melbourne and is currently undertaking a PhD at Monash University within the Anthrozoology Research Group and Animal Welfare Science Centre. She also works part time as a veterinary nurse. Tammie is interested in research involving human-animal interactions, more specifically, studies which involve domestic dog behaviour and ways in which dog welfare can be improved. Her current PhD involves developing a scientifically standardised and validated behaviour assessment for adult companion dogs.

