The development and validation of a Dog Personality Questionnaire and the investigation of associations between behaviour coding and subjective rating and the role of experience in making video assessments on the personality of the domestic dog (Canis familiaris) by the application of the Dog Personality Questionnaire

PhD Thesis
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1. Study I

1.1 Background, aims and hypotheses

In a review Gosling and John (1999) applied the Five Factor Model (FFM) to characterize animal personality where they compared personality structures of 12 species including dogs. Gosling (2003) further examined whether canine personality dimensions represent analogues of the human FFM factors. In order to test this, he used the Big Five Inventory. The wording of four original FFM scales was altered to make them suit dogs’ behaviour and the Consciousness scale was omitted. Kubinyi et al. (2009) established similar scales on the basis of a shorter version of the human FFM (24 questions only). On a large sample of dogs they developed four personality scales: calmness, trainability, dog sociability and boldness. Ley et al. (2008) used a 67 item questionnaire based on dog specific adjectives like ‘non-aggressive’ or ‘trainable’. Five personality dimensions were identified: extraversion, self-assuredness/motivation, training focus, amicability and neuroticism (Ley et al., 2008).

Despite the interest in deriving breed specific “personality-like” profiles neither of the studies above compared the breeds in terms of these specific scales. The use of modified human FFM for dogs may not be advantageous because it lacks dog specific questions. For example, FFM does not distinguish between intra- and inter-specific aggression which is not an issue in humans but which is a very important aspect of a dog’s life.

(1) In this study my first aim was therefore to use a different method by collecting dog specific questionnaire items from people who lived with or trained dogs (see Methods). My hypothesis is that this questionnaire has in this way the potential to grasp some of the behaviour traits of individual dogs at more global level (in sensu McCrae and John, 1992).

(2) My second aim was to provide some ways of internal and external validation for the personality dimensions obtained by the questionnaire.

(3) My third aim was to investigate how the five personality dimensions are represented in the ten Fédération Cynologique Internationale (FCI) breed groups and in a group of mongrels.

(4) My fourth aim was to compare two popular breeds in Hungary. My choice fell upon the comparison of the German shepherd dog and the Hungarian vizsla because the ancestors of the former breed were originally bred for herding sheep, the latter was used as a gun dog.
1.2 Subjects and Methods

1.2.1 Subjects

1.2.1.1 Dogs representing the 10 FCI groups and mongrels

The dogs and their owners were recruited on voluntary basis from dog training schools, dog-shows, from among the participants of our Family Dog Research Database and from different parts of the country reacting to our notice in the Hungarian edition of International Dog Magazine calling for dog keepers to fill in my Dog Personality Questionnaire. The sample consisted of 284 animals of the 10 FCI breed groups, balanced in number for all the groups with regard to how many breeds are registered under a particular FCI category and sixty-eight mongrels were also added to the sample. In order to avoid overrepresentation on the part of any of the breeds, maximum 8 dogs were included from any of the breeds. The total sample size consisted of 352 dogs.

1.2.1.2. The Hungarian vizsla and the German shepherd dog

The questionnaire data of thirty-six Hungarian vizslas and fifty-five German shepherd dogs were involved in the experiment.

1.2.2 Methods

1./ The development of the questionnaire: eight lists of dog typical traits were written altogether by a dog expert, by two breeders and by five dog owners. Then the eight lists were compared and from the overlapping items the ones which captured dog personality in the most telling way were retained. The final version of the Dog Personality Questionnaire contained 38 items with concise examples for each one with a 5-point frequency Likert scale ranging from ‘not typical at all’ (1) to ‘absolutely typical’ (5). Data were also collected regarding the owners’ as well as the dogs’ demographic data.

2./ As regards internal validity, Principal Component Analysis was used to examine the factorial structure of the questionnaire scores. The internal consistency of the questionnaire was estimated by the calculation of Theta (Armor, 1974).

3./ In order to investigate discriminant validity the factor scores of all the four factors were correlated.

4./ In order to test the external validity of the questionnaire, group comparisons were planned to analyze the effect of the dogs’ age, sex, weight and training background on the scores of the four factors.
In order to compare the effect of training background and also to reveal whether there is a statistically significant difference between the factor scores of the personality dimensions of the Hungarian vizsla and the German shepherd dog, independent-sample t-tests were also implemented.

1.3 Results

1. The scales obtained by Principal Component Analysis were: Stranger-directed Sociability, Activity, Aggressiveness and Trainability.

2. The internal consistency was found satisfactory, because all Theta values were 0.90. Usually, values above 0.7 are regarded desirable (Armor, 1974).

3. In investigating discriminant validity, Spearman’s correlation coefficient was found low, suggesting only weak association among the personality dimensions.

4. When analysing the potential associations between the demographic variables and the factor scores the dogs had on each personality dimension in order to examine external validity, the scales were found to correspond well with the results of other studies published earlier.

5. When comparing breed-groups registered in Fédération Cynologique Internationale (FCI) and a distinct group of mongrels I found that in the case of pet dogs there were only slight detectable differences between breed-groups and breeds regarding the above scales.

6. As for the comparison of two breeds, the Hungarian vizsla and the German shepherd dog, after matching for the demographic differences of the sample, I could not reveal any alterations in the personality dimensions between the two breeds kept as pets.

1.4 Conclusions

The comparison of breed-groups and breeds revealed little differences. My observations suggest that the environmental factors could mask or even enhance breed differences. Breed groups may contain dog breeds which are actually kept in very different ways. If breeds with such different environmental history are combined in one breed group then it is less surprising that the relatively large variation masks any potential breed-group specific effects. For this reason, further research should pay attention to balancing the demographic variables in the samples, otherwise, the environmental factors will in all
probability put shadow on the genetically determined differences or similarities they intend to unveil between the target breeds and/or breed groups.

2. Study II

2.1 Background, aims and hypotheses

There are two main methods to record information about the behaviour of individual animals. One is behaviour coding, which is based on units of behaviour (ethograms: Martin and Bateson, 2007; Lehner, 1996), the other one is subjective rating of behavioural tendencies on ordinal scales (e.g. Kubinyi et al., 2009). In the case of behaviour coding, the occurrence of discrete, well-defined behaviour units without reference to their function are recorded. Subjective ratings focus on the aggregated character of animal behaviour and observers pay little attention to small, specific behaviour units. Since subjective rating rely on the subjective judgement of the observers, they are sometimes considered less reliable than behaviour coding (e.g. Gosling, 2001).

However, examination of inter-observer agreement, internal consistency and test-retest reliability have proven that the reliabilities of subjective ratings can be strong (for a review see Weinstein et al., 2008) and some even argued subjective ratings are more reliable than behaviour coding (Vazire et al., 2007). Though both methods provide grounds for considering that they are valid, few studies have studied the possible correlations between subjective rating and behaviour coding (for a review see Gosling, 2001).

If both behaviour coding and subjective rating as methods are reliable to the same extent, the rating and coding measures of the traits reflecting the same underlying factors must converge (Vazire et al., 2007). For instance, if the owner rates the dog as highly noise sensitive, the dog should avoid an object producing a loud noise in a behaviour test.

1./ My first aim in Study II was thus to examine the convergence between behaviour coding and subjective rating. My hypothesis was that some associations may be revealed between behaviour coding and subjective rating but strong correlations might not be found because of the quantitative nature of the former and qualitative nature of the latter method.

A number of researchers argue that during a test battery the behaviour of an animal in reaction to a particular stimulus can be under the influence of various factors like the presence of other dogs around the test scene etc. and the inner state of the target animal can also change during the course of the test
situations (e.g. Jones and Gosling, 2005). The behaviour of the target animal in a test battery thus might not accurately reflect a particular aspect of a dog’s character (e.g. Jones and Gosling, 2005).

2./ My second aim was thus to investigate correspondence between the dogs’ behaviour in the test battery and owners’ report with the exclusion of any potential divergences resulting from the qualitative vs quantitative quality of the two methods. For this reason I carried out a second experiment. Independent observers unfamiliar with each dog were asked to watch the video clips of a test battery, then rate the dogs on the video by filling in the same questionnaire the owner had completed. In this way the data sets I gained only differed in the amount of knowledge the assessors had about each dog. My hypothesis was that there will be significant variability between owner’s ratings and the assessment of the dogs done by the three independent rater groups.

3./ Few studies have examined the influence of the assessors’ previous experience on subjective ratings of dogs based on video recordings of test batteries (Tami and Gallagher, 2009). To investigate the potential impact of prior experience, the third aim of my second study was to compare the assessments of three rater groups each having different levels of hands-on experience with dogs. The three groups comprised dog trainers, independent dog owners and people who had never kept a dog. My hypothesis was that the owners’ report will not show strong association with the assessments of any of the rating groups, but the assessments of all the rating groups will reveal significant correlation with each other.

My investigations in Study II followed the direction suggested by Jones and Gosling (2005), namely that future research on the personality of individual dogs should focus on the comparison of different methods.

2.2 Subjects and Methods

2.2.1 Experient I: The comparison of the questionnaire study and behaviour coding

2.2.1.1 Subjects

I collected the video recording of the FIDO Personality test (Brúder et al., manuscript) of 100 dogs and asked the owners to fill in the Dog Personality Questionnaire (Mirkó et al., 2012). In this way I obtained both the video recordings of the test battery and the completed questionnaires of the 100 dogs. The dogs and their owners were recruited on voluntary basis to participate in the
Family Dog Research Programme of the Department of Ethology, Eötvös Loránd University. The sample comprised 27 breeds registered in the FCI (Fédération Cynologique Internationale) breed groups and six mongrels.

2.2.1.2 Methods

Spearman correlation was applied to investigate the associations between the hypothetically corresponing questionnaire items and the variables of behaviour coding.

2.2.2 Experiment 2. The comparison of the owners’ ratings and the video-based ratings done by humans with different levels of experience with dogs

2.2.2.1 Subjects

As has been described above, I had both the video recordings of the FIDO Personality test and the DPQ completed by the owners of 100 dogs. Of these, I used the data of 33 beagles to compare the owners’ subjective ratings and the video-based subjective ratings of three rater groups.

2.2.2.2 Methods

To compare owners’ reports and the assessments of each rater group with regard to each factor, the data were analysed with one-way ANOVA and post hoc test was done with Dunnett’s pairwise comparison. Spearman correlation was used to investigate the associations between the four sets of assessments given by owners, trainers of non-included dogs, owners of non-included dogs and non-owners.

2.3 Results

2.3.1 Experiment 1.

1./ With regard to Trainability no correlation could be detected between any of the questionnaire items and the hypothetically corresponding test battery variables.

2./ In the case of Stranger-directed Sociability, I revealed correlation between owners’ reports and the dogs’ behaviour during the test situation. Those dogs which were reported ‘initiative’ and ‘not mistrustful with unfamiliar
humans’ approached the experimenter with shorter latency and played more with her than those who were scored lower on these questionnaire items.

3./ For the factor Activity, no correlation was found between the owners’ report and the behaviour of dogs displayed in the Spontaneous activity phase of the test battery. Association was revealed between the owners’ report regarding the dogs’ preference for ball games and playing and their behaviour in the corresponding subtest. Those dogs which were reported to like ball games and like playing with the owner played with the ball as well as with a tug more in the test situation than those which were scored lower on the questionnaire item ’likes fetching balls’.

4./ As regards the factor Aggressiveness, the questionnaire item ’shows a tendency to bark’ correlated with the dogs’ aggressive reactions (growl, bite, attack) in the Bone take-away subtest and with the ’latency of getting the DNA sample’ in the Getting DNA sample subtest.

2.3.2 Experiment 2.

In the case of Stranger-directed Sociability, Activity and Aggressiveness the owner’s report correlated with the assessments of all the three rater groups and the assessments of the rater groups correlated with each other as well. As regards Trainability, the owners’ report did not correlate with the assessments of any of the rating groups, but the assessments of all the rating groups correlated with each other.

2.4 Conclusions

My findings in Study II suggest that there is a need and room for testing whether behaviour traits measured by the means of questionnaires and behaviour tests converge.

The lack of associations between the hypothetically corresponding questionnaire items or factors suggest that there is further need for collaboration between researchers developing behaviour tests and questionnaire studies. Ideally, this research should be done in parallel.
Publications providing the basis of the thesis


References


Brüder, I., Kubinyi, E., De Meester, R, Pluijmakers, J., Miklósi, Á. Manuscript. Introducing a simple behaviour test battery for family dogs (FIDO) and a case study for cross-laboratory comparison.


