

The study of domestic cat (*Felis catus*) personality based on survey in Poland

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Abstract: *The study of domestic cat (Felis catus) personality based on survey in Poland.* On the basis of Internet survey and using specially structured questionnaire for owners authors obtained data concerning assessment of behaviour of 161 domestic pure breed and mixed breed cats. Working on this data various statistical procedures were applied with Principal Component Analysis (PCA) as a chief method to extract personality dimensions in domestic cat. Authors obtained five dimensions of cat personality: openness, quietness, affiliation, activity and anthroaffiliation. The distinction between affiliation (in cat group context) and anthroaffiliation (in relation between cat and man) was firstly revealed in this study. The data also showed that some specific factors (age, duration of play with caretaker) have effect on cat personality. The comparison of personality of pure breeds and mixed breed cats referred rather to vocal communication than to its affiliation with human being (anthroaffiliation). Results of this study yielded by authors may be applied in shelters procedure of cat adoption.

Key words: cat, personality, behaviour

INTRODUCTION

The concept of animal personality is coined to the great degree on the basis of human psychology and using the meaning of human personality. It is common assumption that like in man, individuals of various species of non-human animals consistently differ from one another in

behaviour in such a way that these behaviours can be described as individual traits. These differences should be consistent across time, contexts and situations thus is the meaning of personality in animals (Biffa and Weiss 2010). Personality types are described in the wide array of the animal species from the invertebrates like octopuses to the higher vertebrates like apes. Methods of measurement and construction of personality typology in animals (e.g. so-called Big Five) are also basically adapted from human psychology (Gosling and John 1999).

There is relatively small number of publications (over 20) focused on the personality of felids and domestic cat (*Felis catus*). Bradshaw et al. (2012) summarizing various works claim that in the relation with people three types of cat personality are evident: confident-trusting, timid-nervous and aggressive-active. However, recent review of studies on cat personality shows that there is disagreement among scientists as to methods, drawn conclusions even the terminology (Gartner and Weiss 2013). Therefore, it seems that much more work is needed

to gain reliable information concerning personality in domestic cat. Like in the domestic dog the development of adequate typology of cat personality could be useful not only for cat owners but also for animal shelter staff (e.g. during an adoption procedure).

In the present work authors tried to provide new data concerning cat personality conducting a survey of cat owners. This study is “bottom-up” type (Mehta and Gosling 2008). Authors did not use some established typology, but elaborated own findings to show the personality tendencies in cats. The focus of this study was to analyse presumed difference between the personality characteristics revealed in cat–man relation and the personality characteristics observed in relation of cat with other cats and with other animals.

MATERIAL AND METHODS

The study was carried out in 2015. The authors elaborated Internet survey concerning cat personality. The questionnaire dedicated for cat owners was designed. It was divided into two parts. The first part comprised of questions concerning basic characteristics of animal (sex, age, breed, colour, neutering status etc.) and description of its home environment (e.g. presence of children, outdoor or indoor cat, presence of perching and resting areas, toys, scratching post, toilet, etc). Following main part of questionnaire comprised of 46 questions. They deal with relation with owner,

strangers, other cats and other animals. Designing questionnaire various situations were taken into account (play at home, walking with cat, journey by car, presence in veterinary clinic clipping nails, holding cat etc.). Nearly all questions of questionnaire were closed-ended with ordered response choices. Responses were not ranked. However, later they were transformed to numbers using special script (numbers ranged from 0 to 1 with equal intervals). One questionnaire was dedicated to one cat (but not to one household). There was free access for all persons interested in participation in the survey to the electronic version of questionnaire at www.site. In some cases paper version of questionnaire was also used.

Statistical calculations were performed using a statistical software package IBM SPSS version 23. The most important statistical procedure employed was Principal Component Analysis (PCA) which identifying patterns in data and expressing the data in such a way as to highlight similarities and differences (Smith 2002). In the case of psychology and personality studies it enables to search for main personality trait, so-called personality dimensions. The second statistical procedure used by authors was calculation of relationship between cat psychological traits and the other traits. Spearman correlation or t-Student test were used to this end.

RESULTS AND DISCUSSION

A total of 165 questionnaires were submitted by the cat owners: 156 as e-mail questionnaires and nine in the paper version. Reliable data was available for 161 questionnaires. Therefore, the study included a total of 161 cats.

In this group sex ratio was nearly 1 : 1 with 81 tomcats and 80 queens. The age of cats ranged from several months to 21 years but 67% of individuals were kept within the bounds of 5 years of age. Only 11% of cats exceeded 10 years of age. Greater number of individuals (75%) was of mixed breed. Pure breed cats belonged to several breeds but in this study only two of them have some significance: British Shorthair and Maine Coon. Number of individuals in each case contributed to 9% of all animals studied. Over 90% of cats of the whole group were neutered.

Following statistical procedures related to PCA were employed. Firstly,

preimage matrix was used to eliminate variables which contributed little to analysis. In this way questions concerning interactions of cat with the other pets were rejected. Secondly, Kaiser–Meyer–Olkin index was calculated to ascertain if it is valid to perform PCA. Authors got satisfactory value of 0.724. Thirdly, scree test was employed to decide how many factors to retain when applying PCA. The obtained graph determined the point at which the last significant drop took place. The break between the steep slope and a levelling off indicates the number of meaningful factors, different from random error. In the authors findings the levelling begin at 4. However, after some considerations concerning contribution to variation authors decided in favour of five factors (Fig. 1).

Finally, on the basis of obtained data authors proposed five broad personality dimensions for the domestic cat: openness, quietness, affiliation, activity and

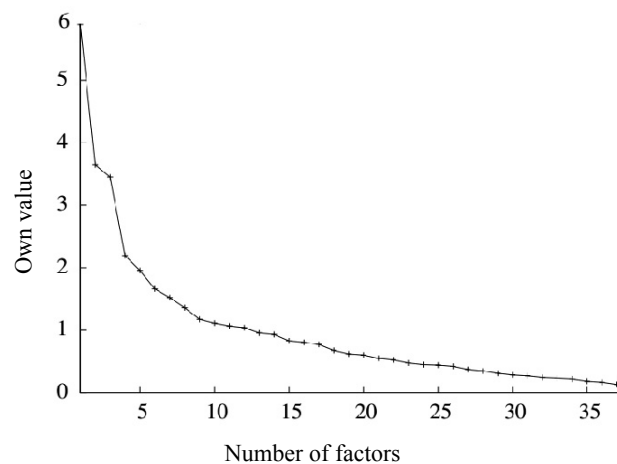


FIGURE 1. Scree test results

anthroaffiliation (Table 1). The short description of these dimensions could be as follows:

1. Openness reflects the high degree of cat favourable attitudes towards new persons and new places. This cat will also show no fear in confrontation with new objects and situations.
2. Quietness is equal to lacking of aggressiveness in the cat either towards caretaker or other persons. This cat is also quiet in veterinary clinic and can put up various unpleasant experiences there.
3. Affiliation in cat means affiliation with other cats, the tendency to socialize with members of its own species. Cat with high degree of affiliation is ready to contact and play with other cats and does not show any sign of aggression. It likes to be amidst its cat companions.
4. Activity means that a cat is physically active and excitable, ready to play with people or with the other cats. Cat is also able to resolve various problem tests. Animal with such personality is very demanding for caretaker, needs frequent physical and psychological stimulation by play or by other interactions.
5. Anthroaffiliation means affiliation of cat with man. Statistical procedure employed in this study allowed to separating this category from factor affiliation. The animal with high anthroaffiliation likes many forms of physical contact with its owner (holding, grooming etc.) but shows negative reaction to harness and walking on lead.

In further analysis of factors their distribution was examined and skewness coefficient was calculated. Skewed left distribution was ascertained in the case of factors quietness and anthroaffiliation. Coefficients values were -1.352 and -1.277 respectively. Figures 2A and 2B show histograms for these factors. On the other hand, distributions for remaining factors turned out to be more close to symmetrical. Calculated skewness coefficient values in these case were higher than -1 .

Age of cat and duration of play with cat were the most important traits in the matrix of correlations obtained by authors. These findings of emphasized significance are shown in Table 2. It seems that domestic cat coming into age becomes generally less friendly towards strange persons and the other cats as well. It becomes less active, more aggressive towards other cats, also less likely tolerates new place, journey by car and veterinary clinic. Analysis showed also the effect of duration of owner playing with the cat on social behaviour observed in cat group. Individual which played longer with its owner was more friendly in relations with the other cats. It could easily react to non-aggressive contact from the other individuals and is ready to play with them.

Some other correlations are also worth to mention. For example neutered animals became definitively indoor cats, and they retreated from conflicts with other cats over food or over favourite sleeping place. They also frequently avoid contact with strange persons. Pure

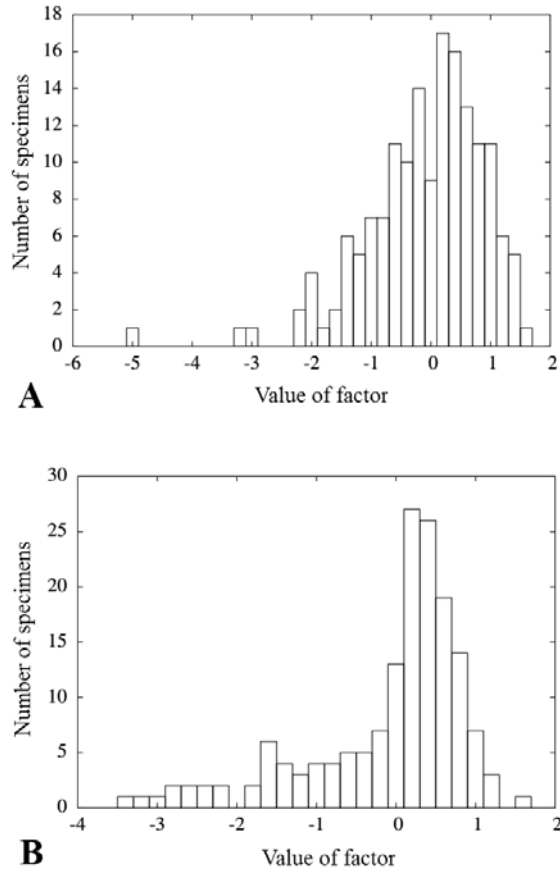


FIGURE 2. Distribution for factors: quietness (A) and anthroaffiliation (B)

breed cats turned out to be shyer and more vocally communicative than mixed breed cats. Both relationships were ascertained using t-Student test for equality of means. It was difficult to compare personality traits in various pure breeds because of relatively small total number of individuals in these groups.

It is important to emphasize that expected natural differences between the sexes were observed only once. Females were more aggressive towards strange persons than males.

These findings may be compared with other works on domestic cat personality (Gosling and John 1999, Bradshaw et al. 2012). Some personality dimension like activity and to some degree affiliation and openness were found in this works.

However, authors of the present study have to distinguish between affiliation (in cat–cat relation) and anthroaffiliation (in cat–man relations). This distinction is absent in other works. Besides contrary to various opinions (e.g. Bradshaw et al. 2000) present results suggest that

TABLE 1. PCA results which demonstrates behaviour characteristic impact (load) on the personality dimension

Code	Question of behaviour in survey	Personality dimensions				
		openness	quietness	affiliation	activity	anthro-affiliation
1	2	3	4	5	6	7
01	Cat is friendly towards familiar people	.352	.126	-.063	.155	.624
02	Cat is friendly towards unfamiliar people	.796	.077	.064	.008	.288
03	Cat likes to be amidst familiar people	.390	-.019	-.023	.077	.594
04	Cat likes to be amidst unfamiliar people	.798	.006	.079	.051	.254
05	Cat likes to be amidst cats	.144	.029	.728	.153	-.162
06	Cat is active	.68	.38	.237	.802	-.014
07	Cat is eager to play independently	.109	.081	.235	.708	-.15
08	Cat is eager to play with the caretaker	.198	.172	.167	.711	.119
09	Cat is eager to play with other cats	.124	.112	.677	.414	-.162
10	Reaction to new objects	.285	-.196	.090	.228	.261
11	Reaction to visitors	.883	-.087	.064	.020	.039
12	Reaction to new place	.645	.052	.104	.192	-.013
13	Solving problem 1	.165	-.084	.059	.480	-.070
14	Solving problem 2	-.067	.130	-.155	.527	-.009
15	Reaction to commands and tricks	-.109	.054	.058	.033	.284
16	Reaction to petting	.157	.353	.025	.047	.574
17	Reaction to holding	.244	.337	.043	.183	.495
18	Reaction to grooming	.273	.297	.028	-.102	.452
19	Reaction to clipping nails	.109	.565	.073	-.085	.185
20	Reaction to action of the other cat	.229	.201	.671	.038	-.156
21	Behaviour in a vet clinic	.164	.484	.133	.191	.134
22	Reaction to journey by car	.340	.187	.058	.081	-.272
23	Reaction to harness and walking on lead	.275	.069	.048	.210	-.407
24	Cat is fearful	-.505	-.050	.167	-.058	.198
25	Cat is alert	-.262	-.084	.397	.228	-.008
26	Cat is friendly towards other cats	.213	.118	.747	.061	-.182
27	Cat is quiet	.107	.339	.022	-.356	-.041
28	Cat is excitable	.031	-.320	.141	.505	.58
29	Cat is aggressive towards caretaker(s)	.33	-.769	-.093	.360	-.027

TABLE 1, continued

1	2	3	4	5	6	7
30	Cat is aggressive towards unfamiliar people	.35	-.625	-.039	-.124	-.066
31	Cat is aggressive towards other cats	.177	-.113	-.575	.018	-.321
32	Cat attacks caretaker(s)	.17	-.776	-.040	.075	.070
33	Cat attacks unfamiliar people	.064	-.726	-.023	-.035	-.004
34	Cat attacks other cats	.149	-.144	-.594	.092	-.301
35	Cat avoids caretaker(s)	.071	.151	.114	.108	-.447
36	Cat avoids unfamiliar people	-.740	-.016	-.002	-.055	-.030
37	Cat avoids other cats	.086	.116	-.383	-.029	-.091

TABLE 2. Spearman correlations of behaviour related to personality traits with the age of cat (x) and with the duration of play with caretaker (y)

x	Code of behaviour according to list in Table 1								
	03	05	06	07	08	09	10	13	18
CA ^x	-.179*	-.227**	-.459**	-.498**	-.417**	-.402**	-.637**	-.227**	-.1
DP ^y	.038	.095	.325**	.221**	.111	.310**	.351**	.195*	.173*
x	21	22	23	24	27	29	31	32	35
CA	-.386**	-.185*	-.268**	-.321*	-.398**	-.285**	.200*	.292**	.278**
DP	.380**	.222**	.259**	-.042	.471**	.137	-.067	-.088	-.135
x	36	37							
CA	-.160*	.207**							
DP	-.043	-.092							

* Significant ($P < 0.05$); ** highly significant ($P < 0.01$).

cat personality may be influenced by some non-psychological factors (like age of animals). Discussing the breed effect authors found only minor differences between pure breed and mixed breed cats. Moreover, these differences did not refer to the cat–man affiliation which was suggested by other authors (Turner and Bateson 2000). It is worth to add that previous works of Polish investigators suggested that mixed breed cats were more aggressive towards their

caretakers than pure breed cats (Koziniec 2014).

In this work it was impossible to investigate an effect of human family characteristics on cat behaviour.

CONCLUSIONS

The survey data concerning 161 cats helped to create cat personality dimensions to some degree different from described in literature. Affiliation with

other cats and anthroaffiliation turned out to be distinct dimensions.

Age of cat and duration of its play with caretaker seemed to be important factors which have effect on cat personality.

These personality dimensions of cat have consequences for its owner (e.g. cat active or less affiliative). Therefore, this knowledge concerning cat personality could help in adoption at the animal shelter.

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Streszczenie: *Badanie osobowości kota domowego (Felis catus) na podstawie ankiety przeprowadzanej w Polsce. Na podstawie ankiety internetowej i stosując specjalnie rozbudowany kwestionariusz dla właścicieli, autorzy uzyskali dane dotyczące oceny zachowania się 161 kotów rasowych i mieszańców. W opracowaniu danych zastosowano różne procedury statystyczne, z analizą głównych składowych jako główną metodą wyabstrahowania wymiarów osobowości u kota domowego. Autorzy uzyskali pięć takich wymiarów: otwartość, łagodność, afiliacja, aktywność i antroafiliację. Rozróżnienie afiliacji (w kontekście grupy kotów) od antroafiliacji (w relacji między kotem a człowiekiem) ujawniono po raz pierwszy w tym badaniu. Dane pozwoliły stwierdzić, iż pewne specyficzne czynniki (wiek, długość zabawy kota z opiekunem) mają wpływ na osobowość kota. Porównanie osobowości kotów rasowych i nierasowych odnosiło się do raczej do komunikacji głosowej kota niż do jego afiliacji z człowiekiem (antroafiliacji). Wyniki autorskich badań można wykorzystać w procedurze adopcyjnej kotów stosowanej w schroniskach.*

Słowa kluczowe: kot, osobowość, zachowanie

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