

Studies on Socialization Characteristics Using Two Temperament Tests in German Dogue, Doberman and Riesenschnautzer Puppies

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ABSTRACT

The object of study was the influence of the nervous system type (temperament) of dogs from the German Dogue, Doberman, and Riesenschnautzer breeds on the extent of their socialization (adaptation to the environment). Two tests were used to examine the animals' behavior: the mirror test and the Queinnec test. It was established that puppies of the German Dogue breed possessed the highest socializing capabilities, followed by the Riesenschnautzer and Doberman breeds. This means that the representatives of the German Dogue breed would require the least amount of training time in order to form specific behavior. The Riesenschnautzer exhibited average ability to socialize, and will adapt to the environment more easily than the Doberman breed and with more hardship than the German Dogue. The puppies that would be hardest to train were the ones from the Doberman breed, as they are most prone to aggression and ill temper.

Key words: Puppies, socialization, temperament type, behavior, test

ÖZET

GERMAN DOGUE, DOBERMAN VE DEV SCHNAUTZER KÖPEK YAVRULARINDA SOSYALİZASYON ÖZELLİKLERİ ÜZERİNE İKİ MIZAÇ TESTİ KULLANILARAK ARAŞTIRMALAR

Araştırmanın amacı, German Dogue, Doberman ve Dev Schnautzer köpek ırklarında sinir sistemi faaliyeti tipinin (mizaç) bunların sosyalizasyonlarının (çevreye adaptasyonu) ölçüsüne etkisinin incelenmesidir. Hayvanların davranışlarını incelemek üzere iki test uygulanmıştır: ayna testi ve Queinnec testi. German Dogue köpek ırkına ait yavruların en yüksek sosyalizasyon becerisine sahip olduğu ve bunları Dev Schnautzer ve Doberman ırklarının takip ettiği görülmüştür. Bu durum, German Dogue köpek ırkına ait bireylerin özel bir davranışı oluşturabilmek için en az eğitim süresine ihtiyaç göstereceğini ortaya koymaktadır. Dev Schnautzer sosyalleşmek için ortalama bir beceri göstermiştir ve bulunduğu çevreye Doberman'dan daha kolay, German Dogue'dan ise daha zor adaptasyon gösterecektir. Agresyona ve kötü huylu mizaca en fazla yatkın olanlar Doberman ırkından olduğu için eğitilmesi en zor olan köpek yavruları da Doberman ırkından olacaktır.

Anahtar kelimeler: Köpek yavruları, sosyalizasyon, mizaç tipi, davranış, test

Introduction

The dog is the first animal to be domesticated by man. Based on the qualities of its six senses, this exceptionally smart animal exercises many “jobs” nowadays (**Denkov, 1996; Mitzulov, 1993; Uzunova, 2006**). It is used as a companion, hunter, shepherd, rescuer, courier, postman, border patrol, criminal investigator, customs officer, natural resources detector, children guardian, disabled people’s assistant, healer (the dog can detect human emotions and successfully recognizes psychotic states) and odourologist (in service of the police). The dog also has significant participation in scientific studies (**Diedrich, 1998; Gyffroy, 1998; Queinnec, 1996**).

The issue of dog socialization has always attracted the attention of ethologists, as it reflects on its overall behavior (**Petkov et al, 1999**). In recent years the typification of the dog’s nervous system (temperament) has been considered increasingly significant. If owners were aware of their dogs’ temperament, they would be able to communicate with them more successfully and have a more appropriate approach towards their upbringing and the formation of desired behavior. Potential stress

conditions, such as nerve ticks, manias, depressions, ill temper, aggression, howling, crying, and biting, could be avoided (**Saetre et al., 2006; Uzunova, 2006**). In this relation, the temperament type is of great importance to the extent of socialization and the formation of specific behavior (**Diedrich, 1998; Renaud, 1999**). Just as in humans, 4 temperament types have been described in dogs (**Haupt, 2007; Renaud, 1996; Vastrade, 1994**):

- strong, balanced, calm, brave – type L, sanguine;
- strong, unbalanced, brave – type F, choleric;
- weak, unbalanced, slow, fearful – type G, phlegmatic;
- weak, unbalanced, irritable, sometimes aggressive, fearful – type A, melancholic; This temperament type is also called asocial;
- mixed – a temperament exhibiting features of two or more nervous system types, yet not sufficiently studied by ethologists. Currently, it is believed that only 4 temperament types are well known and studied in dogs (**Campan et**

al., 2002; Keeling et al., 2002; Renaud, 1996; Queinnec, 1996).

Studies performed so far have shown that socialization happens most correctly and easily in dogs with type F or L temperaments (**Arata et al., 2010; Montagnier, 1998; Uzunova, 2006**). According to the same authors, the nervous system type should be established between the 3rd week and the 3rd month after birth. During this period (**Haverbeke, 2010; Ley et al. 2009; Queinnec, 1996**) have found that typification of the puppies' temperaments is obligatory in order to ensure their proper adaptation to the environment, efficient training, and formation of certain behavior.

The available literature could not offer studies and results regarding the temperament typification of dogs of the Doberman, Riesenschnautzer, and German Dogue breeds. These breeds were chosen due to their wide usage as guards, border patrols, customs dogs, protectors, and companions.

Ethology offers various tests (**Diedrich et al., 2006; Renaud, 1996; Vastrade, 1994**) suitable for this purpose. However, it is not yet established which of them provides the most accurate results and is accepted best by the young puppies.

In this relation, the aim of this study is to typify temperaments and their influence on socialization through the mirror test and the Queinnec test (**1996**). Reference information about their application is scarce.

Material and methods

The experimental work was carried out during the month of October for a duration of 2 weeks. The test animals were privately owned weaned puppies (bred together indoors under home conditions) at 9 months of age from 12 litters (4 per breed). All test animals were subjected to parasitological examination. Existing helminthic invasions were treated with Drontal puppy using the recommended dosages.

The rearing conditions were uniform and in concordance with veterinary hygienic requirements. Puppies from the three breeds tested lived in separate premises (each of 15 m² area). Microclimatic conditions were determined on a daily basis and were as followed: ambient temperature 20 °C, air humidity 65%, air velocity 10 m/s, light/dark cycle of 12/12 h.

Drinking water was supplied ad libitum in three large metal bowls of 1.5 L each. The feeding was performed with commercial dry food "Royal Canin" according to dog's breed and age. Daily ration (1100 KJ energy per 1 kg body weight) was divided into three equal daily portions.

The temperaments of 36 puppies, 12 from each breed, equal in weight and kept under the same conditions were tested (twice within 3 days) first with the *mirror test* and afterwards with the *Queinnec test*. Every puppy was tested separately by two unfamiliar ethologists (competent veterinarians) for a duration of 30 minutes. The emphasis was on the animals' breed, rather than gender.

Mirror test sessions were performed in an empty unfamiliar room (with an area of 10 m²), in the centre of which was placed a large and stable mirror, so that the animal would be reflected in entirety. Behavioral reactions at the moment the animal would see its reflection in the mirror were described.

For the *Queinnec test*, the same room was used, with a circle of three chairs placed inside and a toy puppy (brown, immobile, brown in colour, and the size of a pincher dog) about 1 metre away from the chairs.

Through observation and chronometry the behavioral activities (*purposefulness and orientation, fear, confidence, aggression, curiosity, indifference*) were examined and assessed on a scale of 1 (+), 2 (++), and 3 (+++), which is applied in other areas of cynology as well (e.g. to assess a dog's

intelligence). For convenience, the animals were marked as follows:

Doberman breed

Litter A1- puppies № 1, 2 (males), № 3 (female);

Litter A2- puppy № 4, 5, 6 (males);

Litter A3- puppy № 7 (female), № 8, 9 (males)

Litter A4- puppy № 10,11,12 (females);

Riesenschnautzer breed

Litter B5- puppies № 13, 14, 15 (females);

Litter B6- puppies № 16, 17 (males), № 18 (female);

Litter B7- puppies № 19, 20, 21 (females);

Litter B8- puppies № 22 (female), № 23, 24 (males);

German Dogue breed

Litter C9- puppies № 25, 26, 27 (females);

Litter C10-puppies № 28, 29 (males), № 30 (female);

Litter C11-puppies № 31, 32, 33 (males);

Litter C12-puppies № 34, 35 (males), № 36 (female);

The results from the ethological studies were presented as a table rather than an ethogram because its preparation requires a minimum of 48 hours of observation and the applied tests did not allow for such duration. In order to examine the condition and structure of the formed breed groups, and establish a correlation between the breed and temperament type, the data were processed statistically by calculating of absolute and relative values, Pearson χ^2 , maximum likelihood χ^2 and association ratios based on χ^2 .

The experimental setup was arranged in accordance with the normative requirements for protection and humane treatment of animals, as well as zoohygienic and food standards for this type and category of dogs.

Results and discussion

Puppies № 9, 15, 16, 17, 19, 20, 21, 22, 23, 25, 27, 28, 29, 32, 33, 34, 35, 36, during the first test (the mirror test), stood confidently in front of the mirror (2 minutes) and would then hop around playfully (10 minutes), pushing it with their paws (10 minutes) and staying close to the apparently interesting object (8 minutes). The puppies did not whimper, did not try to bite the mirror, and demonstrated high interest towards their mirror image. They tried to make contact by scratching it.

During the second test, the same behavior could be observed with the difference being that puppies № 19, 23, 27, 33, 34, and 35 tried to make contact with their mirror images by pushing the mirror slightly (5 minutes).

During the first test (Queinnek test) the same puppies demonstrated the same confidence and calmness during the entire session (30 minutes). They headed straight for the plush dog as soon as they saw it, played with it (15 minutes), pushing and climbing onto it, yet they backed away a bit when they heard the toy's barking before they resumed playing with it (11 minutes). During the final 4 minutes, the animals would abandon the plush object and moved away from it, as if due to loss of interest. No whimpering could be observed in this case. Only puppies № 9 and 33 bit the toy (1 minute).

During the second test, there was only one but significant established difference: all test animals lost interest in the toy during the last 8 – 10 minutes. They moved away, and then approached it again without playing with it.

Specific behavioral activities: very good orientation (+++), purposefulness (+++), confidence (+++), lack of fear and confusion (+++), curiosity (+++), aggression (++) , low extent of aggression in some of the puppies (+).

Puppies № 2, 3, 4, 6, 7, 8, 11, 12, 13, 18, 26, and 30, during the first test (mirror test), stood for about 5 – 6 seconds without moving after

seeing the mirror, then rushed towards it. They were playful toward their mirror image: they scratched it, pushed it, and made sounds from time to time (20 minutes). During the last minutes of the test they moved away from the mirror and went behind it, then returned back in front of it (10 minutes).

During the second test, there were slight behavioral differences. Puppies № 2, 6, and 30 headed straight for the mirror without being afraid and stood in front of it, playing for a longer period of time (20 minutes). They pushed their mirror image with their paws, moved behind the mirror, then back in front of it. During the next 6 minutes they abandoned the object and played among themselves, yet they stood in front of the mirror again during the last 4 minutes.

During the first test (Queinnec test), the puppies (2, 3, 6, 7, 8, 13, 18, 26, 30) demonstrated nearly the same behavior as in the mirror test, with the difference being that they did not stand still at first but headed directly towards the toy dog, grabbed it, and reacted with slight whimpering to its sounds (sign of pleasure). Playing would continue for 22 minutes. During the last 8 minutes they abandoned the toy, as if realizing that it was an inanimate object. The puppies lost interest towards it.

During the second test no significant differences were observed.

Specific behavioral activities: good orientation /++/, purposefulness /++/, confidence /+++/, lack of fear and confusion /+++/, curiosity /+++/, aggression /++/.

Puppies № 1, 5, 24, 31, during the first test (mirror test), exhibited intriguing behavior. During the first 10 minutes they would continually come closer and go away from the mirror. Eventually they stood still in front of it, showing interest towards their own reflection. They played with the mirror for 20 minutes. They spent a lot of time looking at their reflections, scratching the mirror, pushing it,

moving behind it, and then going back in front of it. Undoubtedly they exhibited interest much longer than the puppies tested beforehand.

During the second test, the animals headed towards the mirror much more confidently. Still, № 24 and 31 kept coming back, and then stood still in front of it for 10 minutes. The rest of the puppies immediately positioned themselves in front of the mirror and examined it closely (20 minutes).

During the first test (Queinnec test), puppies № 1, 5, 24, 31 wandered around the plush toy but did not dare touch it (14 minutes). Puppy № 5 was the first to touch the toy dog, which produced barking. The rest immediately retreated and could reach the toy again after 3 minutes, cautiously playing with it (9 minutes). During the last 4 minutes none of the observed puppies exhibited any interest towards the toy. They were playing among themselves and did not produce any sounds for the entire duration of the test.

During the second test (Queinnec test), no significant differences in the behavior could be established.

Specific behavioral activities: orientation /+/, purposefulness /++/, confidence /+/, fear and confusion /+++/, curiosity /+/, aggression /+/.

Puppies № 10 and 14 during the first and second test (mirror test) exhibited the following behavior: noticing the mirror on the 19th minute of the test session, they headed straight for it. They seemed to be afraid when they saw their own reflected image and went back whimpering. The time they spent in front of the mirror was only 2 minutes. For the rest of the test session they stood away from it and did not approach it again.

Puppies № 10 and 14 during the first and second test (Queinnec test) exhibited the same fear, lack of interest, and caution as in the mirror test. During most of the test session (23 minutes) they stood away from the plush dog,

whimpered, ran in circles. During the last 2 minutes, they approached the toy, touched it, yet moved away immediately when they heard the sound it produced. During the last minute, №10 was trying to bite the toy.

Specific behavioral activities: orientation /+/, purposefulness /+/, fear and confusion /+++/, curiosity /+/, aggression /+++/.

The examined group of animals was divided into groups according to two characteristics (breed and temperament type simultaneously), with the information being presented in tables

(Table 1). The first row describes the temperament types: A - Melancholic, G - Phlegmatic, L - Sanguine, F - Choleric. The first column lists the three dog breeds – Doberman, Riesenschnautzer, and German Dogue, and the table cells contain the amount of units possessing the respective combination of both characteristics:

Apart from absolute values, the distributions of animals can also be expressed via several types of relative ratios.

Table 1. Grouping of dogs according to the temperament type and breed in absolute values (numbers)

	A	G	F	L	
Doberman	1	2	8	1	12
Riesenschnautzer	1	1	2	8	12
German Dogue	0	1	2	9	12
Total	2	4	12	18	36

Legend: A - melancholic, G - phlegmatic, L - sanguine, F - choleric.

Table 2 is derived from Table 1, the information from which was used to calculate several types of relative ratios. Analysis of the results from Table 2 gives reason to make the following description:

- The first row for each of the three breed groups shows the relative frequencies per rows, which is the share of units against the total number of animals in the respective group. It was established that the largest relative share in the Doberman breed group belongs to the puppies with choleric temperaments (66.67%), for the Riesenschnautzer breed – puppies with sanguine temperament (66.67%), and for German Dogue – again puppies with sanguine temperaments (75%).
- The second row of each group calculates the relative frequencies per columns, reflecting the share of units from a certain breed against the total number of dogs with the respective temperament type.

- From the total number of dogs with a melancholic temperament, 50% are of the Doberman breed and 50% of the Riesenschnautzer breed. This temperament type was not observed in the German Dogue.
- The share of animals with a phlegmatic temperament was distributed per breeds as follows: 50% of the Doberman breed, 25% of the German Dogue breed, and 25% of the Riesenschnautzer breed.
- In the group of dogs with a choleric nervous system type, it was established that the largest share belongs to the Doberman breed (66.67%), compared to all observed with this temperament, and the smallest share – to the German Dogue breed and Riesenschnautzer (16.67%), for both breeds.
- In the group of animals with a sanguine temperament, the largest share is the one of the German Dogue breed (50%), followed

by Riesenschnautzer (44.44%). The lowest percentage of sanguine puppies was observed in the Doberman breed (5.56%).

Table 2. Grouping of the dogs according to their temperament type and breed in relative ratios (%)

Breeds		Temperament type				Total
		A	G	F	L	
Doberman	*	8.33	16.67	66.67	8.33	33.333
	**	50.00	50.00	66.67	5.56	
	***	2.78	5.56	22.22	2.78	
Riesenschnautzer	*	8.33	8.33	16.67	66.67	33.333
	**	50.00	25.00	16.67	44.44	
	***	2.78	2.78	5.56	22.22	
German Dogue	*	0	8.33	16.67	75.00	33.333
	**	0	25.00	16.67	50.00	
	***	0	2.78	5.55	25.00	
Total		5.56	11.11	33.33	50.00	100

Legend: A - melancholic, G - phlegmatic, L - sanguine, F – choleric.

* Distribution of puppies from breeds tested according to their temperament vs the total number in the group;

** Distribution of puppies from a certain breed against the total number of dogs with the respective temperament type

*** Distribution of puppies in each table cell against the total number of puppies tested.

- The third row for each of the examined breed groups reflected the total relative frequencies, showing the share of units in each table cell against the total number of dogs. For the German Dogue, there were no puppies with asocial temperament types. The Doberman breed had the lowest relative share with melancholic and sanguine temperaments (2.78%). Next was the Riesenschnautzer breed with the melancholic and phlegmatic temperament, and last was the German Dogue with the phlegmatic temperament. The Doberman breed with the choleric temperament had the largest relative share, followed by Riesenschnautzer with the sanguine temperament (22.2%). The German Dogue breed had the largest relative share with the sanguine temperament (25%) compared to the total number of animals.

As a whole, among the observed three breeds (each of which representing 33.333% of the whole), it was established that 5.56% of the animals were asocial, 11.11% had a phlegmatic nervous system type, 33.33% had choleric temperaments, and 50.00% were sanguine.

Distribution of the tested three dog breeds according to four temperament types is presented on Figure 1.

In order to assess the nature and extent of dependence between temperament type and breed, the following was calculated: Pearson chi-square, as well as the maximum likelihood chi-square, while the extent of dependence between these two characteristics was measured through association ratios, based on χ^2 . The results were presented in Table 3.

At degrees of freedom of $v=(\kappa_1-1).(\kappa_2-1)=6$ and a critical level of significance $\alpha=0.05$, the value of the theoretical characteristic of χ^2 was 12.5916. The empirical characteristic of χ^2 , based on the study data, was greater than the theoretical $\chi^2 > \chi^2_{(0.05,6)}$ (13.833 > 12.5916). We compared the level of significance $\alpha_s=0.032$, correlating to the empirical characteristic and the critical level of significance $\alpha=0.05$. Moreover, $\alpha_s < \alpha$ (0.032 < 0.05). The statistically processed results definitely confirmed that there was a significant correlation between the dogs' breed and their temperament types.

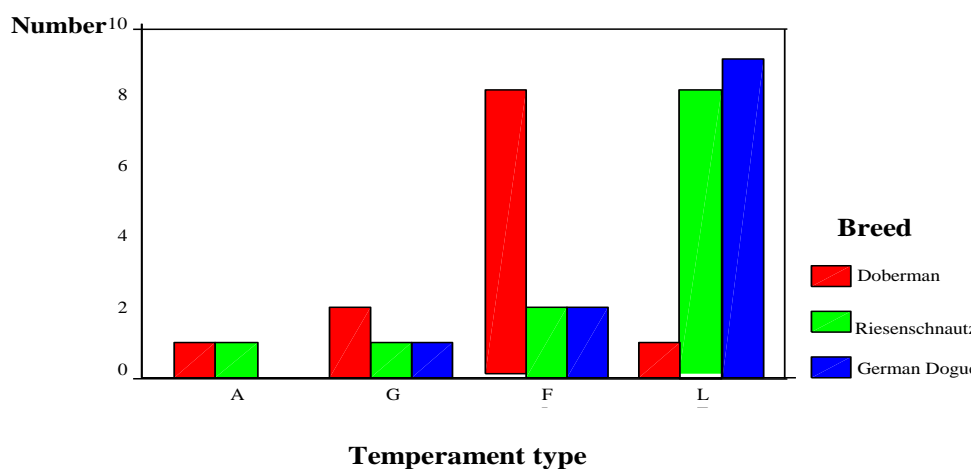


Figure 1. Dogs' distribution according to their temperament type (A - melancholic, G - phlegmatic, L - sanguine, F - choleric) and breed

Table 3. Results from statistical checks of hypotheses and association ratios

Indicators	Value	Degrees of freedom	Observed level of significance
Pearson Chi-square	13.833	6	0.032
M-L Chi-square	15.956	6	0.014
Phi	0.6199		
Contingency coefficient	0.5269		
Cramer's V	0.4383		

Table 3 presents three measurements of association, based on the χ^2 characteristic. Values of the phi ratio ($\varphi=0.6199$) and the contingency ratio ($C=0.5269$) indicate significant interdependence between the two examined characteristics, while the Kramer association ratio ($V=0.4383$) determines the correlation between the two variables as moderate.

Our research team has carried out other behavioural tests (such as the bait test and the statuette test) and found out that they were well accepted by puppies (Uzunova et al., 2008). The utilization of the tests of Toman (Uzunova et al., 2009; Uzunova et al., 2010), however did not yield consistent results. It could be therefore assumed that the mirror test and the animated toy test were easy to perform, convenient, reliable and did not stress the animals.

Analysis of the produced data suggested that the highest extent of socialization was observed in the German Dogue breed, followed by Riesenschnautzer and Doberman. Therefore, dogs of the German Dogue breed would require the least amount of training in order to form a specific behavior.

Second were the puppies of the Riesenschnautzer breed with an average extent of socialization (higher than the Doberman's and lower than the German Dogue's).

The lowest extent of socialization was exhibited by the Doberman breed. These puppies are most prone to ill temper and aggression. Therefore, their owners should be aware that training these dogs would require more time and patience.

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