

EFFECT OF NEONATAL MANIPULATION ON BEHAVIORAL DEVELOPMENT IN LABORATORY CATS

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AIMS

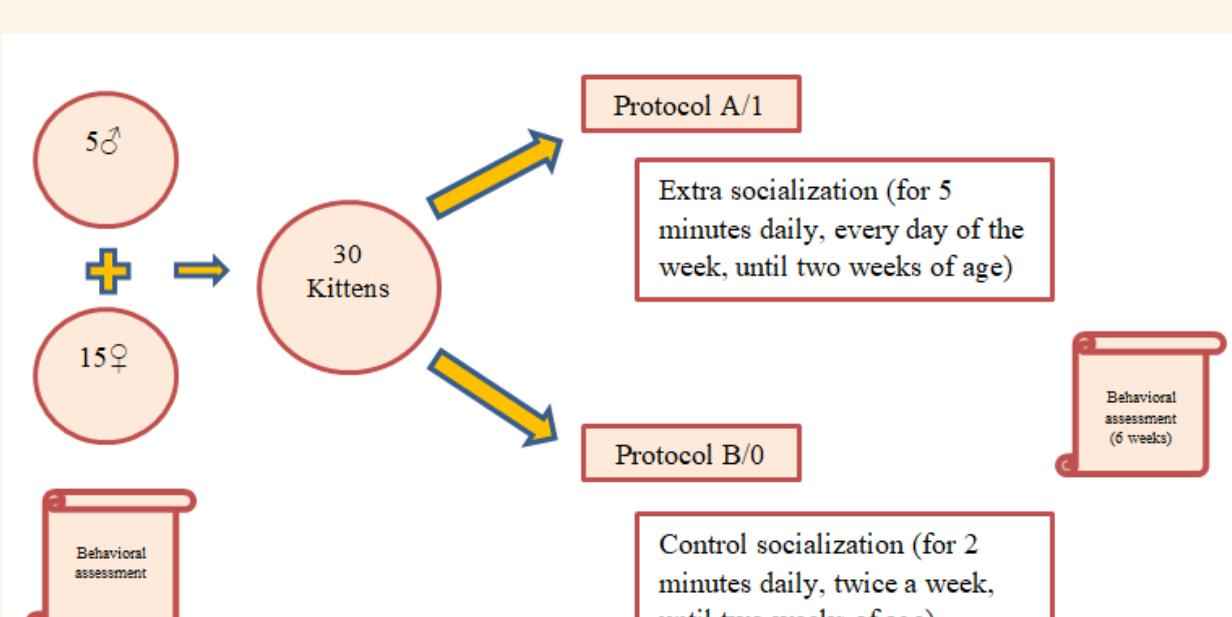
- 1 To know if the extrasocialization plan (in duration and frequency), during the first two weeks of the cats' life, has positive effects on the development of their temperament.
- 2 See the differences in the extra socialization plan of 5 minutes a day/ week compared to one of 2 minutes/ 2 times a week in the first two weeks of life.
- 3 Describe whether or not this positive effect on the development of the character of cats is independent of maternal behavior.
- 4 If it is objectified that the mother's behavior conditions the newborn's behavior, describe how this influence translates into the character of the offspring.

INTRODUCTION

The behavior of cats depends largely on three conditions: their genetics, the temperament of parents (maternal and paternal) and stimuli by external factors. This experimental, longitudinal strategy study aims to test whether or not human manipulation (as an external factor) causes a positive effect on the future behavior of socialized kittens during the first two weeks of life, with an extra protocol. And at the same time find out the importance and influence of maternal temperament on that of their offspring.

METHODOLOGY

Studied species: *Felis catus*
Breed: European Shorthair
Category: SPF Cats (Isoquinen S.L.)



Scheme of the methodology. Own source.

| Entrada | Mare | Temperament_cria | Temperament_mare | Temperament_pare | Tractament |
|---------|----------|------------------|------------------|------------------|------------|
| c1 | Vaqueta | 9,25 | 9,5 | 12,2 | 1 |
| c2 | It | 9,766666667 | 9,5 | 12,2 | 1 |
| c3 | Eva | 13,15 | 7 | 12,2 | 1 |
| c4 | Chaplina | 16,5 | 16 | 11,6 | 0 |
| c5 | Sorry | 14,1 | 21,5 | 11,4 | 1 |
| c6 | Jenny | 9,5 | 10,9 | 13,75 | 1 |
| c7 | Indiana | 11,9 | 8,6 | 14 | 0 |
| c8 | Jaguar | 11,12 | 7,7 | 16 | 0 |
| c9 | Hippita | 16,3 | 20 | 16 | 0 |
| c10 | Ketchup | 15,6 | 22,4 | 14 | 0 |
| c11 | Mostassa | 13,56 | 22,5 | 14 | 1 |

Table of individual behavioral assessments. Own source.

DISCUSSION

Through this work it can be concluded that, as postulated in the objectives of the same, the difference between receiving or not receiving extra socialization during the first two weeks of life is statistically significant ($p = 0,014$). Therefore, it can be stated that the temperament of cats varies depending on the type of socialization, also during this initial period. How they corroborate studies in rodents (Liu D et al. 1997) (Anisman et al. 1998).

Regarding the existence or not of correlation between the temperament of the parents and that of the offspring. Through this project, it has been objectified by means of the correlation of Spearman that according to the results there is a positive tendency between both temperaments, so that the mother's condition conditions that of her litter ($p = 0.0881$ and therefore <0.1). As documented by other authors. (Bradshaw 1992) (Manteca 1996) (Guardini et al. 2016).

REFERENCES

Anisman H, Zaharia MD, Meaney MJ, Merali Z. 1998. Do early-life events permanently alter behavioral and hormonal responses to stressors? *Int J Dev Neurosci.* 16(3-4):149-164. doi:10.1016/S0736-5748(98)00025-2.

Bradshaw JWS. 1992. The Behaviour of the Domestic Cat. First. Wallingford: CABI Publishing.

Guardini G, Mariti C, Bowen J, Fatjó J, Ruzzante S, Martorell A, Sighieri C, Gazzano A. 2016. Influence of morning maternal care on the behavioural responses of 8-week-old Beagle puppies to new environmental and social stimuli. *Appl Anim Behav Sci.* 181:137-144. doi:10.1016/j.applanim.2016.05.006. http://dx.doi.org/10.1016/j.applanim.2016.05.006.

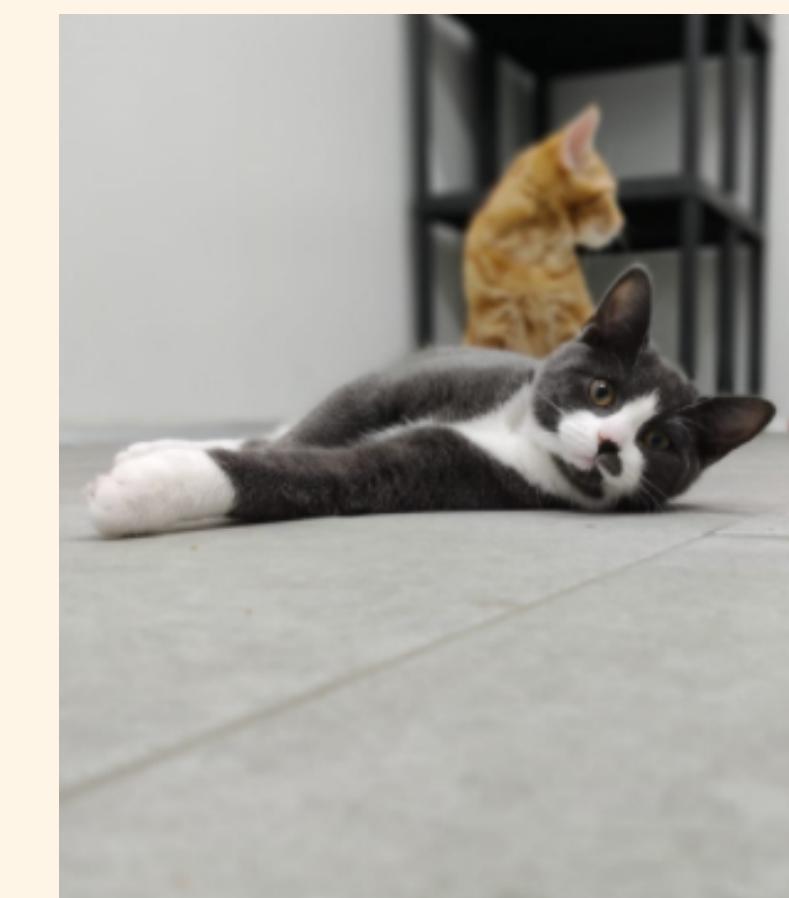
Liu D, Diorio J, Tannenbaum B, Caldji C, Francis D, Freedman A, Sharma S, Pearson D, Plotsky PM MM. 1997. Maternal Care, Hippocampal Glucocorticoid Receptors, and Hypothalamic-Pituitary-Adrenal Responses to Stress. *Science* (80-):1659-62. doi:10.1126/science.277.5332.1659.

Manteca X. 1996. Etiología clínica veterinaria del perro y del gato. 3a edición. S.A. GI-M, editor. Sant Cugat del Vallès.

RESULTS AND ANALYSIS

| Ventada | Mare | Temperament_cria | Temperament_mare | Temperament_pare | Tractament |
|---------|----------|------------------|------------------|------------------|------------|
| c1 | Vaqueta | 9,25 | 9,5 | 12,2 | 1 |
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| c11 | Mostassa | 13,56 | 22,5 | 14 | 1 |

Averages of behavioral assessments according to litter and parents, classified according to the treatment received. Source of the table, own.



Analysis of the effect of socialization treatment on kitten temperament

| Wilcoxon Scores (Rank Sums) for Variable temperament_cria Classified by Variable tract | | | | |
|---|----|---------------|-------------------|------------------|
| tract | N | Sum of Scores | Expected Under H0 | Std Dev Under H0 |
| 1 | 17 | 205,0 | 263,50 | 12,058824 |
| 0 | 13 | 260,0 | 201,50 | 20,000000 |
| Average scores were used for ties. | | | | |

| Wilcoxon Two-Sample Test | | | | | | |
|--|--------|--------|---------|-----------------|--------|--------|
| Statistic (S) | Z | Pr > Z | Pr > Z | t Approximation | Exact | |
| 260,0000 | 2,4282 | 0,0076 | 0,0152 | 0,0108 | 0,0216 | 0,0066 |
| Z includes a continuity correction of 0,5. | | | | | | |

| Kruskal-Wallis Test | | |
|---------------------|----|------------|
| Chi-Square | DF | Pr > ChiSq |
| 5,9983 | 1 | 0,0143 |

Statistically significant difference (with $p = 0.014$ and therefore <0.05). Mann-Whitney Wilcoxon test.

Correlation between kitten temperament and maternal temperament

| The CORR Procedure | | | | | |
|---|----|----------|---------|----------|----------|
| 3 Variables: temperament_cria temperament_mare temperament_pare | | | | | |
| Variable | N | Mean | Std Dev | Median | Minimum |
| temperament_cria | 11 | 12,7915 | 2,05251 | 13,1500 | 9,25000 |
| temperament_mare | 11 | 14,14545 | 3,87799 | 10,90000 | 7,00000 |
| temperament_pare | 11 | 13,60000 | 1,80222 | 14,00000 | 11,40000 |

| Spearman Correlation Coefficients, N = 11 Prob > r under H0: Rho=0 | | | | | |
|---|------------------|------------------|------------------|----------|---------|
| | temperament_cria | temperament_mare | temperament_pare | | |
| temperament_cria | 1,00000 | 0,0881 | 0,60173 | | |
| temperament_cria | | 0,53759 | 0,0881 | -0,04685 | |
| temperament_mare | | | 1,00000 | 0,8912 | |
| temperament_pare | | | | -0,17764 | 0,8912 |
| temperament_pare | | | | | 1,00000 |

Significant positive correlation ($r = \pm 0.53759$, $p = 0.0881$). Spearman correlation.

Data analysis was performed using two types of methods with the statistical program SAS (Statistical Analysis Software) with the help of the UAB Department of Animal and Food Science.



CONCLUSIONS

- Extra socialization during the neonatal period is beneficial in the future temperament of kittens.
- In this project the influence of the maternal character in the conduct of its litter is ratified.
- A better temperament of laboratory kittens involves:
 - Improving their animal welfare (ethically essential).
 - It facilitates tasks in research laboratories that use this animal model.
 - Reduction of stress that may interfere with the results of studies.