Empirical study of some astrological factors in relation to dog behaviour differences by statistical analysis and compared with humans.

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ABSTRACT : A survey comprising 500 pedigree dogs was realised in the Paris region. For each dog six behavioral traits were determined and ten of their astrological traits were retained. A statistical interpretation of the possible relationships between the two sets of traits was performed with permutation tests. Two strong associations were detected between the angular positions of Jupiter and the Sun, and the extraversion dominant trait. Other associations were also suggested. Remarkably, these associations are similar to standard indications proposed by astrology for humans.

INTRODUCTION

For an empirical study, the dog is an appropriate subject for study in the investigation of the possible relationships between birth time and position of sky elements of the solar system. The precise aim is to see if behavioural differences appear in two-month old dogs.

As the first position of the Sun in its ecliptic course, and at the same time, positions of the Moon and planets, the rising (Ascendant) and setting (Descendant) points, the highest (Mid Heaven) and lowest (Nadir) points within the 24 hours of a day were defined. This employed one of the classical tools of astrology, according to which a sky element situated in one of the 4 described points (= "Angular", + or − 10°) is particularly important in determining behaviour. It must be emphasized here that, so far, almost no scientific confirmation has been sought for this. Other classical tools of astrology, like zodiacal signs related to the seasons, are impossible to investigate due to the irregular fertility of females during the year (most the births take place in spring and autumn).

The results obtained for dogs are then compared with those classically described in human astrology.

METHODS

Organisation of the survey

A population of 500 pedigree dogs was identified by one of us (SFB). Pedigree dogs were used because the breeders are always particularly attentive to the conditions of birth, given the potential value of the pups. Thus, when a female begins to give birth, a breeder will stay patiently by the mother day and night, ready to take the pups, note the time, individual colours and so on. When they sell the young dogs they need very precise information to answer the buyer's questions; they frequently want to know the time of birth, the order of births in the litter (was my dog first, second, or last? and so on…), how it behaved during its first days, and weeks of life. As the pups must live with their mother and cannot be sold before two months, their behaviour is very well documented over this period. Every breeder of pedigree dogs keeps a very precise diary, where all this information is carefully entered for each animal, these being identified either by colour differences (zones, patches, spots and so on) or in case of uniform coloration, by means of a cropped area of the coat. (The official book, called "LOF" in France, records pedigrees and births).

It was decided to use different breeds of pedigree dogs to prevent any bias linked to a given breed. They were: Bearded Collie – Belgian Shepherd –King Charles Spaniel– Chihuahua - Coton of Tulear – French Bulldog – German Shepherd – Labrador – Lhassa Apso – Malinois – Poodle – Sharpei – Shitzu - Tibetan Spaniel – Yorkshire Terrier. Geographicaly, the kennels were all in the Paris area to ensure easy contact with the breeders.

The breeders who agreed to participate have no special knowledge of, or interest in, astrology. Over a period of five years, a total of 100 litters were investigated, from 2 to 8 pups in each, for a total of 500 pups. Twelve breeders participated (see acknowledgements).

Recorded traits

For behavioural traits, data from the breeders was used. These noted all behavioural characteristics in detail during the two first months of the pups' lives. They were freely written in ordinary language. Information collected for the experiment, was summarized according to Pr. Eysenck's method (1975) by expressing behaviour under "Extraversion" and "Neuroticism", giving 6 well defined items. They are detailed in Table 1 and the transcription from the free description is given in the Appendix. The different items are always scattered over the range of births in the litters.

For astrological traits, the following ten sky elements were considered: Sun, Moon and eight planets of the solar system (Mercury – Venus – Mars – Jupiter – Saturn – Uranus –Neptune – Pluto). All are usually defined as "Planets" in traditional astrology, and this convention was retained. The repartition of the 500 dogs is given in Table 2. (program "Astropc" from Aureas, 30, rue Cardinal Lemoine, 75005 PARIS France)

STATISTICAL ANALYSIS

The objective was to explore possible links between behavioural traits and astrological traits. Rather than use sophisticated multivariate approaches like correspondence factorial analysis, which are not always easily interpreted and from which it is not convenient to draw inferences, it was decided to practice simple and well-known non-parametric tests for each of the 60 behaviour traits by planet trait combinations.

As an example, let us consider the 2x2 frequency table associated with Jupiter and extraversion dominant which is a sub-table of Table 3. 44 pups are (Ju+,ED+), 65 are (Ju+,ED-), 76 are (Ju-,ED+) and the majority of them, 315 are (Ju-,ED-). To assess the amount of association between the two traits, we used the proportion of the dogs positive for the planet among the ED+ dogs. That is $44/120 = 0.367$. It is worth mentioning that given the total margins of the table (109, 391, 120, 380) this statistic is equivalent to all scores one can imagine to measure the link between the two traits. For instance the odds of the behavioural trait among the Jup-dogs ($76/315 = 0.241$) can be expressed as
$\{120(1-0.367)\}/\{391-120(1-0.367)\}$.

In the same way, the Chi-square statistics of independence can be expressed as a function of this proportion. The advantage of the proportion is that the direction of the possible effect is preserved. Indeed Chi-square statistics do not distinguished low from high proportions, nevertheless a bilateral test of the proportion can be performed.

Once a proportion has been computed, the existence of a significant association between the two traits must be established. To this end the classical procedure of permutation tests (Good, 2004) was used. The principle is simple: under the null hypothesis of no effect a large number of similar samples of data (having the same margins) are simulated. For each of them the proportion is computed, providing an empirical example of distribution where no effect is present. This must be done for a sufficient number of simulations, say N, with respect to the level of the test, say α, one wants to perform. Finally the observed proportion is compared to this distribution, and if it is outside the [$\alpha/2$ quantile, ($1-\alpha/2$) quantile] interval, then the effect is declared significant.

To perform the random permutations, the elementary data set can be seen as a matrix of 500 rows by two columns, where rows correspond to dogs and columns to the two traits. A (1,1) row means that the corresponding dog is positive for both traits; a (0,1) row means that the

corresponding dog is negative for Jupiter trait but positive for ED trait; and so on. The number of (1,1) rows is 44, the number of (0,1) rows is 76, and so on. If there is no link between the two columns, we can permute without consequence the first column giving rise to different numbers of (1,1), (0,1), (1,0), (0,0) dogs but keeping 120 ED+ dogs, 380 ED- dogs, 109 Ju+ dogs and 391 Ju- dogs. A new proportion can be calculated and stored; this is done N times.

Another point deserves some consideration: the level α at which the tests were performed. The traditional level is 5%: α = 0.05. However in the present case, 60 tests were carried out on the same set of data. If this level were used and no links existed between any of the pairs of traits, we would nevertheless expect to see 3 (=0.05x60) significant tests. To avoid this inconvenience, we used the 5% level globally, dividing it by 60 (using α/2=0.0004) according to a majoration known as Bonferroni inequality. Doing so, we drastically decrease the probability of stating significant effects using a conservative procedure. To get sufficient precision for such extreme quantiles, we chose N=1000001 permutations then the number of values greater or less than the aimed quantile is 400 simulated values.

This is the traditional statistical theory, practically we computed P-values for each test which gives the significance for every level. If the P-value is 0.02, then the corresponding test is significant for levels greater (e.g. 5%), and not significant of lower levels (e.g. 1%).

Using this approach, we found two planets having an effect on the same behaviour trait. So it was of interest to detail the possible interactive effect of the planets. To do so, we considered the planet1 x planet2 x behaviour trait table (2x2x2) as a 4 x 2 table, with 4 rows associated with the combination of planets and 2 columns for the behaviour trait. This provided a Chi-Square of independence with 3 degrees of freedom that we further decomposed, nesting the two planets' effects according to the two ways.

RESULTS

The repartition of the dogs for all combinations of behaviour trait and astrological trait are given in Table 3. The main results of the statistical tests are proposed in Table 4 and for the trait ED in Figure 1.
Association between ED and Jupiter, also between ED and the Sun are amazingly strong. The drastic level we computed for the test was far from exceeded. Not one of the 1000001 proportions computed for Jupiter was greater than the observed value! Some other much less impressive associations are suggested, they are shown in Table 4.
Concerning the effect of Jupiter and the Sun for the same behaviour trait (ED), we analysed the possible interaction from the 2x2x2 table (Table 5). It turned out that among the dogs positive for Jupiter (or the Sun) there is no effect due to the Sun (or Jupiter) which is not the case for a dog negative for one of the two planets. Both planets have a strong effect but it does not appear cumulative.

DISCUSSION AND CONCLUSIONS

This empirical study demonstrates that some relationships exist between the moment of birth of dogs characterized by the « angular » positions (e.g. rising, setting and upper/inferior culminations) of astrological planets, and independently assessed behaviour traits. They appears particularly strong for the case of dominant dogs with the Sun and Jupiter, and also, to a lesser extent, for Mercury.

The effects must be compared with one of the tools of classical human astrology concerning, the relationship described (Lewis 2003, Fuzeau-Braesch 2004) for births with the Sun and Jupiter in this "angular" position. Humans in this category are generally described as charismatic, dominant, strong, sociable and influential in a group. This is obviously comparable with the canine equivalent where the corresponding pup holds a dominant position among its peers during its two first months of life. It is always the first to eat and this is accepted by the entire group, it will push the others away with impunity to get the attention of human attendants or just to move around, reported breeders. This parallel is remarkable and can not be due to chance.

Other effects are no more than suggestions, probably a larger sample of dogs would be necessary to detect them statistically with greater confidence. Nevertheless, there are striking similarities with traditional human astrology indicated in Table 4. Notably among them are those concerning the Sun, the Moon, Mercury, Mars, Jupiter, Saturn and Neptune. A "nervous" (NN) dog is often born with Saturn in "angular" position, which may result in a tendency to introversion. A lack of Mars too, which is given as a general weak force, both giving a kind of sensitive and timid animal. The results for the ER ("reserved") animals must also be considered here: they show Jupiter and the Sun in deficit : they are non dominant, non sociable, sensitive with the Moon in excess which is also remarkably similar to classical interpretations for humans. An ambiguity must also be noted in the "affective" (NA) case. This term is always used by breeders for dogs which appreciate being handled and are happy to be held: this is difficult to interpret. No convincing results have been obtained for NS = stable.

The similarity between observations of dogs and human astrological descriptions can only be explained by the existence of a physical causal effect, so far unknown. Dogs seem to react in a very similar way to that which would be predicted by one of the classical astrological rules for humans, the "angular" sky elements. This eliminates the argument frequently advanced to "explain" this astrological tool; the fact that the human mother, knowing the birthchart of her children, influences her child in the "right" direction. Clearly no such cultural factor can occur in dogs. It is also difficult to evoke a factor of hereditary nature because the strong demonstrated link between, for example, "angular" Sun and Jupiter and "dominant" dogs would be always linked with the same positions of this sky elements for each pup, which cannot be received.

Thus it must be supposed that a causal physical influence exists. It is worth recalling here various studies on the reception of waves emanating from sky elements, particularly the Sun and Jupiter. It is well known that in short wave radio, for example, receivers must be retuned at the rising, the culmination and the setting of the Sun, this being a result of the ionosphere acting as a plasma.(Soloviev, 1998). Jupiter has also been much studied for its own waves which reach the Earth in spite of its magnetic environment. (Rogers 1995, Rosolen et al. 2002). Planetary magnetospheres of the various elements of the solar system are now a subject of new and vigorous research with spacecraft observation. They are very dynamic objects (Blanc et al 2005) and it is not inconceivable that the time may be coming to consider interdisciplinary work between astrophysics and astrology.

These observations in dogs must be followed up by much further research of a similar kind, in the search for more insight into the veracity and the limits of astrology. This is all the more necessary as so very few studies of the subject, anywhere in the world, have been so far recognized as scientific (Dean & Mather, 1977), with the exception of those of Gauquelin (1973, 1982) on angular planets and professions.

In future, they may also concern the cognitive sciences linked to the organization of behavioural differentiation of individuals.

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APPENDIX

List of words used by the breeders (translated terms with original French terms) to characterize the behaviour of pups, and how they were associated with the 6 behaviour traits in the study.

ACTIVE (actif)

Active – actif
Bold – audacieux
Rascally – coquin
Daring – culotté
Curious – curieux
Clever – débrouillard
Bright – dégourdi
Impudent – effronté
Wide-awake – éveillé
Expressive – expressif
Frisky – exubérant
Go-getter - fonçeur
Happy, cheerful – gai
Noisy – gueulard
Playful – joueur
Crafty – malin
Responsive – réactif
Animated – remuant
Spontaneous – spontané
Lively – vivant
Roguish – voyou
Vivacious – vif

DOMINANT (dominant)

Aggressive – agressif
Belligerant – bagarreur
Strong character – caractère fort
Boss of the litter – chef de la portée
Determined – décidé
Dominant – dominant
Shameless – effronté
Strong – fort
Greedy – gourmand
Eat well – mange bien
Snappy – mordant
Doesn't give in – ne cède pas
Gets what he want – obtient ce qu'il veut
Afraid of nothing – peur de rien
Knows what he wants – sait ce qu'il veut

Happy everywhere – se plait partout
Beguiling – séducteur
Sociable - sociable

RESERVED (réservé)

Aloof – à l'écart
Silly – bêta
Always give in – cède toujours
Timorous – craintif
Discrete – discret
Distant – distant
Dominated – dominé
Sleepy – dormeur
Not dominant – non dominant
Unaggressive – pas agressif
Unplayful – pas joueur
Timid – réservé
Self-effacing – s'écrase devant les autres
Solitary – solitaire
Touchy – susceptible
Shy – timide

AFFECTIVE (affectueux)

Friendly – affectueux
Likes petting – câlin
Confident – confiant
Affectionate – doux
Tender – tendre

NERVOUS (nerveux)

Sensitive – sensible
Diffident – effacé
Impressionable – impressionable
Nervous – nerveux
Timid – peureux
Whiny – pleureur
Whimperer – pleurnichard
Wild – sauvage
Restless – agité

STAID (stable)

Staid - stable
Compliant – adaptable
Pleasant – agréable
Friendly – aimable
Demonstrative – avenant
Cool-headed – bien dans sa tête
Relaxed – décontracté
Balanced – équilibré
Happy – heureux caractère

Independant – indépendant
Not dominant – non dominant
Not afraid – pas craintif
Calm – pas nerveux
Not shy – pas timide
Fits in anywhere – s'adapte à toutes situations
Sedate – sage
Sure of himself – sûr de lui
Quiet - tranquille

Table 1: Description of the six behaviour traits, their codings and associated distribution for the 500 dogs.

Table 2: Codings for the ten planets and distributions of the 500 dogs. (ANGULAR (+) = rising, setting, upper and lower culminations of the sky elements)

Table 3: Joint distribution of the dogs for each combination of any astrological trait (in rows) and behaviour traits (in columns). Each 2x2 subtable comprises the 500 dogs. The two remarkable subtables are in bold

Table 4: For each behaviour trait, planet effects detected (***), strongly suggested (*) or suggested (-) by statistical analysis and classical signification attributed in traditional astrology for humans. By detected, it is considered significant at 0.0002, by strongly suggested it is considered significant at 10% and by suggested it is considered the strongest effect among the ten planets, or almost 10% significant.

Table 5: Distribution of the 500 dogs according to Jupiter, the Sun and Extraversion Dominant trait.

Figure 1: For the ED behaviour trait, the proportion of positive dogs for each of the ten planets is displayed (solid line with dots). The other lines show the empirical distribution computed by the permutation test: the solid line is the median, the dashed lines are respectively from bottom to top, the quantiles 0.0001, 0.0004 (dotted), 0.001, 0.01, 0.05, 0.95, 0.99, 0.999, 0.9996 (dotted), 0.9999. Planets have been ordered according to their *P*-values.
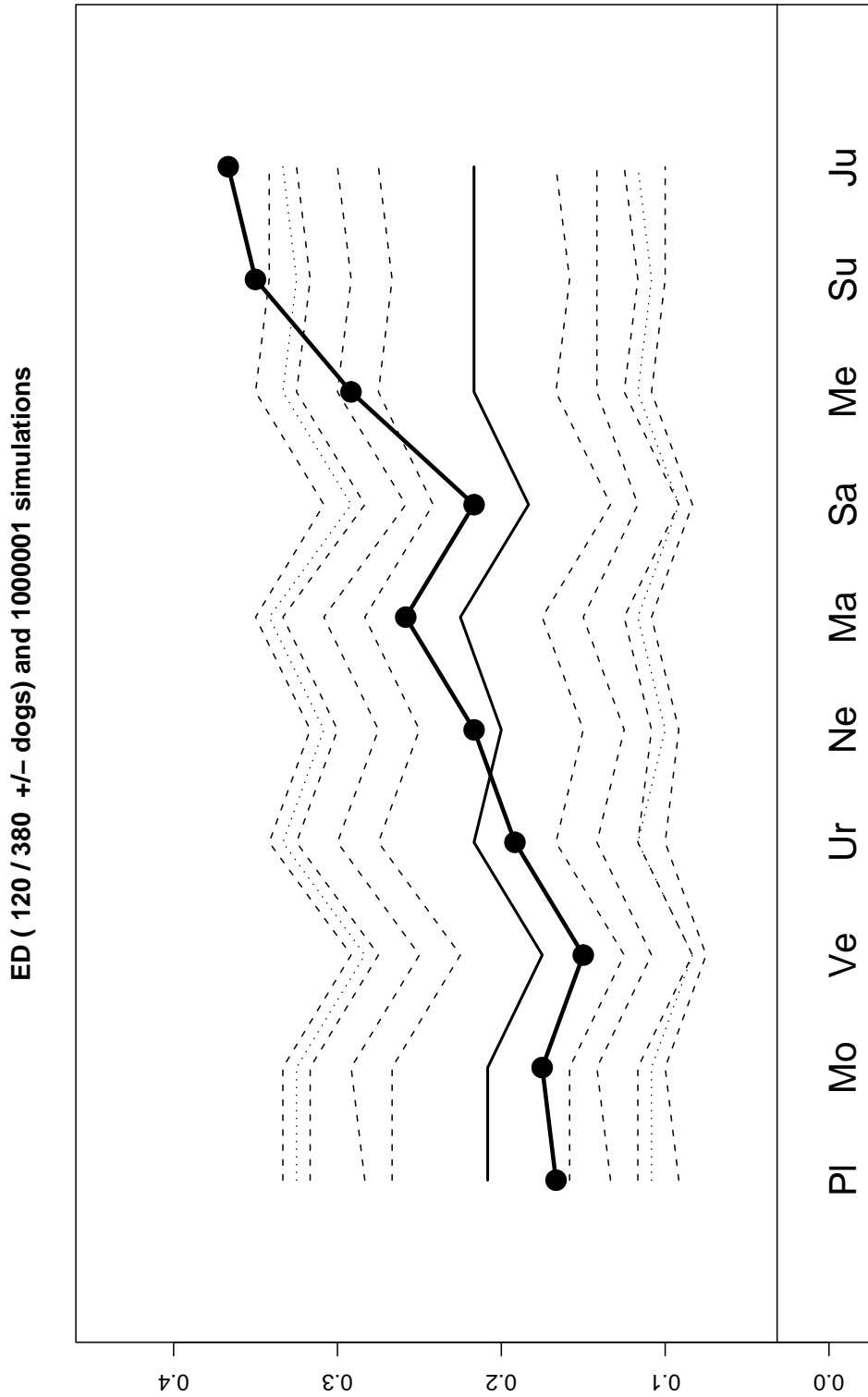
Table 1

Behaviour Trait	Coding	Presence (+)	Absence (-)
Extraversion Active	EA	237	263
Extraversion Dominant	ED	120	380
Extraversion Reserved	ER	137	363
Neuroticism Affective	NA	194	306
Neuroticism Nervous	NN	43	457
Neuroticism Steady	NS	182	318

Table 2

Astrological Trait	Coding	ANGULAR (+)	None (-)
Sun	Su	107	393
Moon	Mo	106	394
Mercury	Me	110	390
Venus	Ve	88	412
Mars	Ma	113	387
Jupiter	Ju	109	391
Saturn	Sa	93	407
Uranus	Ur	109	391
Neptune	Ne	99	401
Pluto	Pl	105	395

Table 3

	EA+	EA-	ED+	ED-	ER+	ER-	NA+	NA-	NN+	NN-	NS+	NS-
Su+	56	51	**42**	**65**	24	83	43	64	7	100	42	65
Su-	181	212	**78**	**315**	113	280	151	242	36	357	140	253
Mo+	48	58	21	85	35	71	33	73	10	96	39	67
Mo-	189	205	99	295	102	292	161	233	33	361	143	251
Me+	50	60	35	75	25	85	47	63	9	101	37	73
Me-	187	203	85	305	112	278	147	243	34	356	145	245
Ve+	43	45	18	70	27	61	39	49	8	80	29	59
Ve-	194	218	102	310	110	302	155	257	35	377	153	259
Ma+	52	61	31	82	29	84	48	65	5	108	44	69
Ma-	185	202	89	298	108	279	146	241	38	349	138	249
Ju+	58	51	**44**	**65**	20	89	48	61	8	101	38	71
Ju-	179	212	**76**	**315**	117	274	146	245	35	356	144	247
Sa+	38	55	26	67	24	69	29	64	12	81	38	55
Sa-	199	208	94	313	113	294	165	242	31	376	144	263
Ur+	53	56	23	86	30	79	46	63	8	101	37	72
Ur-	184	207	97	294	107	284	148	243	35	356	145	246
Ne+	47	52	26	73	25	74	47	52	7	92	37	62
Ne-	190	211	94	307	112	289	147	254	36	365	145	256
Pl+	55	50	20	85	33	72	41	64	12	93	32	73
Pl-	182	213	100	295	104	291	153	242	31	364	150	245

Table 4

Behaviour trait	Associated Planet (with *P*-values of significance)	Traditional Interpretation for Humans
EA (active)	Jupiter in excess (-, 0.069), Saturn in deficit (-, 0.099)	active, extravert, sociable, charismatic not reserved, not introvert
ED (dominant)	Jupiter in excess (***, 0.000), Sun in excess (***, 0.00002), Mercury in excess (*, 0.012), Pluto in deficit (-, 0.112).	Active, extravert, sociable, charismatic strong personality communicative ? , Various interpretations
ER (reserved)	Jupiter in deficit (*, 0.009), Sun in deficit (-, 0.12), Moon in excess (-, 0.059)	non-dominant, non charismatic, non sociable, weak personality sensitivity
NA (affective)	Moon in deficit (*, 0.042), Neptune in excess (*, 0.019), Saturn in deficit (-, 0.059).	insensitive, dreamy unthinking
NN (nervous)	Mars in deficit (*, 0.047), Saturn in excess (*, 0.038)	lacking in force, introvert
NS (stable)	Pl in deficit (-, 0.095)	? , various interpretations

Table 5:

	ED+	ED-
Ju+ and **Su+**	10	12
Ju+ and **Su-**	34	53
Ju- and **Su+**	32	53
Ju- and **Su-**	44	262